SAP Printing

Customer documentation

Volume 3 : [DC122]

Device-specific information

for
- Ricoh   SP C340DN
                        SP C342DN

Version: 1.44

Abstract:
This document contains device-specific information about the device hardware and accessories, the configurable features, related limitations, and the commands necessary to configure the settings in the device type.

C o n t e n t s

1. General Device Information

This chapter contains general information about the devices.

SAP device types to use:
- PCL-based   **ZA0x**, ver 005+

Device / Model name:

• **[DC122a]**	SP C340DN	
• **[DC122d]**	SP C342DN	

Compatibilities/Emulation: HP LaserJet 4050 PCL 5e

Firmware (PCL):

Note: It is recommended to always use the latest firmware.

Speed: [DC122a]: 25/26ppm (A4/LTR simplex LEF)
[DC122d]: 25/26ppm (A4/LTR simplex LEF)
[DC122a]: 25/26ppm (A4/LTR duplex SEF)
[DC122d]: 25/26ppm (A4/LTR duplex SEF)

Printer queue name   `lp`

2. Device Hardware Accessories

This chapter contains information about the standard or optionally available hardware accessories of the devices.
The Description column indicates the name of the unit, its properties, and, where applicable, the supported paper sizes and the sheet capacity.
It also contains a list of features which can be configured on the device's front panel, as well as their initial factory defaults.

For more device-specific information, see also the device's corresponding Operating Instructions manual.

Device Hardware Accessories

Unit		Description
Memory (RAM)	standard	2048 MB Max memory: 2GB. For detailed information about how much memory is needed for which resolution, please see (*).
Hard Disk	optional	- Capacity = 20 GB (Only DC112d)
Standard Paper Trays		Standard input bins
- **Tray 1**	standard	- Capacity = 500 sheets - Paper = see (*)
Paper Feed Units		(paper input) additional input trays
- **Tray 2**	optional	• **[Paper Feed Unit TK1220]** - mounted below Tray 1 - Capacity = 500 sheets - Paper = see (*)
Bypass	standard	(paper input) Bypass Tray unit - mounted at the front - Capacity = 100 sheets - Paper = see (*)
Duplex unit	optional	(paper path) needed for duplexing - Paper = see (*)
Standard Output Tray	standard	(paper output) - Capacity = 500 sheets

Note: (*) = See the corresponding Operating Instructions manual.

Features configurable on the device front panel

The following table specifies those features that can be configured from the device's front panel, and their initial factory default settings.
For those features whose setting is typically unlikely to be changed often, they can be configured once on the device front panel, and thus need no configuration from the SAP system side.

Feature	Initial (factory) setting
• Resolution	600 dpi
• Edge smoothing	On
• Symbol set	PC-8
• Tray priority	Tray 1
• Duplex mode	Off
• Auto Continue	Off
• Toner saving	Off
• Tray Switching	Off
• Extended Auto Tray Switching	Off
• Sub Paper Size (*)	Auto
• Copies	1
• Letterhead Setting	Auto Detect
• Edge to Edge Print	Off

Note: (*) Paper size override function

3. Features & Commands

This chapter contains one section for each configurable feature.

The features are ordered by importance (how often used) and logical order (in the processing of the job).
- 3.1 - 3.7   = likely to be configured / changed
- 3.8 - 3.13   = unlikely to be changed often
- 3.14 - 3.21   = changing makes no sense or has no effect, or it must or should not be changed
- 3.22 - ...   = additional features

Each section contains the following information about the feature:

1. Description of the **Feature**
2. Table of all possible **Settings** for this feature, and the **Values** necessary to specify in the **Command**(s).
        An (*) indicates that the interpretation of a value is subject to some restriction.
3. Dependencies/Constraints, other remarks
4. (for each Printer language and each related Command):
    a. Tag (this is used to clearly mark where the Command is located in the device type)
    b. Command syntax (see Appendix 1 below for general information on the printer language)
    c. Initial command (as an example, and as it is shipped in the device type)
        The entire initial command sequence of a particular device type is listed in the corresponding Volume 2.

Note: (Print controls)
For some of those features that can be specified per page, paragraph, or character, Print controls are defined.
Where applicable, these are also listed in the Settings/Values table of the feature.

General remarks:
- The order in which the commands appear in the device type, and in which they are sent to the printer, is roughly the same as the one generated by our Windows drivers. To make sure the controller doesn't get problems, this order should be maintained.
  Please also note that some commands are sent automatically by the SAPscript driver, on which we cannot take any influence.
- Be aware that some settings may require modifications in more than 1 place !

SAP-specific syntax issues:
- A `"#"` at the beginning of a line is the SAP comment symbol. It means that the line will not be sent to the printer.
- Non-printable characters have to be entered as SAP escape characters.

Notation conventions:
- All commands are printed in fixed-spaced Courier font.
- The "`^^^`" indicates a place-holder for a value that has to be looked up from the Settings/Values table.
- **<...>** indicates a place-holder.
- A `"##"` in front of a line is to indicate that it should never be uncommented.
- [...] indicates optional text that can be omitted.

3.1 Input Bin

Description:
Specify the input bin from where to take the paper.

Settings/Values:

^^^ [PCL.01]	Print control	Interpretation	Capacity (# sheets)
0	TRYST	Print out current page from currently active input bin (remains unchanged)	--
7	--	Auto Tray Select	--
2	TRYMN	Bypass Tray (for sheet paper)	100
3	TRYME	Bypass Tray	
8	TRY01	Tray 1	500
1	TRY02	Tray 2	500

Dependencies/Constraints:
- For the paper sizes supported by a particular bin, please see the corresponding Operating Instructions manual.
- Special2, Bond, Cardstock, Label, CoatedPaper, ThickMatCoated are only from Bypass.
- If no Input bin select command is sent, the "Tray priority" setting of the device will be used.

Note: (Using the HPL2 ABAP list driver)
When using the HPL2 ABAP list driver, the PCL command for this setting will not become effective.
You need to use the SAP mechanism to specify the Input Bin.

Note: (The SAP mechanism to specify the Input Bin)
- For ABAP & SmartForms:
Under SAP this setting can also be specified in the definition of the Output device.
The "Output attributes for list drivers" tab has a setting named "Paper tray".
The selectable values "Tray 1" | ... | "Tray 10" | "Single sheet" | "Envelopes" | "ManualEnvelope",
correspond to the Print controls TRY01 | ... | TRY10 | TRYMN | TRYEN | TRYME.
This setting is only used by the HPL2 ABAP list driver.
If the standard ABAP list driver is used, the setting has to be specified in the command at [PCL.01] in the "Printer initialization" action in the Device type.
- For SAPscript:
The TRYxx print control to be used for a particular page can be specified in the definition of the Form used by the document, under "Page layout" -> <page> -> [Attributes] -> "Print attributes" -> "Resource name".
- For SAPscript and SmartForms under POSS:
The Input Bin can be configured using POSS option 01. For more information please refer to the section on POSS in Volume 2.

Note: (Forcing a particular Input bin for SAPscript)
As explained above, the desired input bin for SAPscript can be specified in the "Resource name" field of the definition of the SAPscript FORM. If it is not desired to assign a fixed input bin to a SAPscript FORM, then this field should be left empty, and the desired input bin should rather be specified in the "Printer initialization" action of the Device type, at tag [PCL.01]. This is, however, only possible if the SAPscript FORM does not specify an input bin yet. If the SAPscript FORM does already specify an input bin that is undesired, and if it cannot be changed, please contact Technical support for how to override it.

Note:
This command can NOT be used to specify the input bin for transparencies in connection with the slip sheet function.
Instead, it needs to be commented out, and the PJL commands DOCBODYTRAY [PJL.20c] and possibly TRAY [PJL.20d] have to be used.

3.1.1 Tag: # [PCL.01] INPUT BIN

Command syntax:
- \e&l^^^H

Initial / Example:
- #\e&l7H

3.2 Paper Type

Description:
Paper type (Media type) should be configured for two reasons:
1. Different paper quality and thickness may require a different fusing temperature. This is called **Fuser control**.
2. The device keeps track of which paper type is contained in each input bin. When a certain paper type is specified in the print job, the controller can automatically select an appropriate input bin containing the requested paper type and paper size.
Both features can be configured through either the PCL command (preferred) or the PJL MEDIATYPE command.

Settings/Values:

^^^ [PJL.04b]	^^^ [PCL.12]	Print control	Interpretation
BOND	5WdBond	XTBND	Bonds
COLOR	6WdColor	-- (*)	Color Paper
ENVELOPE	9WdEnvelope	-- (*)	Envelope
LABELS	7WdLabels	XTLBL	Labels
LETTERHEAD	11WdLetterhead	XTLTH	Letterhead paper
MIDDLETHICK	12WdMiddlethick	-- (*)	Middle thick paper

PLAIN	6WdPlain	XTPLN	Plain / Normal paper
PLAINORRECYCLED	--	-- (*)	Plain / Normal paper or recycled paper
PREPRINTED	11WdPreprinted	XTPRN	Preprinted paper
RECYCLED	9WdRecycled	XTRCY	Recycled paper
SPECIAL	8WdSpecial	XTSPC	Special paper
SPECIAL2	9WdSpecial2	-- (*)	Special paper2
THICK	6WdThick	XTTHK	Thick paper
THIN	5WdThin	-- (*)	Thin
GLOSSY	7WdGlossy		Glossy paper
GLOSSYCOATED	13WdGlossyCoated	-- (*)	GLOSSYCOATED
MATCOATED	10WdMatCoated	-- (*)	MATCOATED
THICKMATCOATED	15WdThickMatCoated	-- (*)	THICKMATCOATED

Note: (*): Currently not supported by a Print Control.

Dependencies/Constraints:
- Only the Bypass tray supports "Envelop", "Bond", "Cardstock", "GlossyCoated", "MatCoated" and "Special2".For the paper types supported by a particular bin, please see the corresponding Operating Instructions manual.

3.2.1 Tag: # [PJL.04] PAPER TYPE 1/2

Command syntax:
- @PJL SET FUSERCONTROL = ^^^ \r\n   -- [PJL.04a] -- This command is NOT supported by this device.
- @PJL SET MEDIATYPE = ^^^ \r\n   -- [PJL.04b]

Initial / Example:
- #@PJL SET FUSERCONTROL = PLAINPAPER \r\n
- #@PJL SET MEDIATYPE = PLAIN \r\n

3.2.2 Tag: # [PCL.12] PAPER TYPE 2/2

Command syntax:
- \e&n^^^

Note: The value ^^^ has the following structure: "<decimal length of keyword> W <keyword>"; the <keyword> starts with a "d".

Initial / Example:
- #\e&n6WdPlain

3.3 Duplex Mode

Description:
Duplex means printing on both sides of a sheet of paper.

Depending on the **Binding edge** (the edge of the page that would be used for binding the document), there are 2 different orientations of the rear page with respect to the orientation of the front page possible and necessary.
There are two different notions of indicating the binding edge.
- The notion of **Long-/Short-edge binding** is independent of the orientation of the contents of the pages.
- The notion of **Side (Left-edge) / Top binding** is related to the above through the orientation of the printout, as follows:

	Portrait	Landscape
Long-edge	Side	Top
Short-edge	Top	Side

Settings/Values:

^^^ [PJL.17a]	^^^ [PJL.17b]	^^^ [PCL.03]	Print control	Interpretation
OFF	--	0	SPMSI	Simplex
ON	LONGEDGE	1	SPMDU	Duplex, Long-edge binding
ON	SHORTEDGE	2	SPMTU	Duplex, Short-edge binding (Tumble)

Dependencies/Constraints:
- Duplex requires a Duplex unit.
- Duplex is disabled for these Media types: "Envelop", "Bond", "Cardstock", "GlossyCoated", "MatCoated" and "Special2".
- Switching between different duplex modes within a document is supported.
- Duplex is disabled when "Slip sheet printing" is active.

Note: (Using the HPL2 ABAP list driver)
When using the HPL2 ABAP list driver, the PCL command for this setting will not become effective.
You need to use the SAP mechanism to specify the Duplex mode.

Note: (The SAP mechanism to specify the Duplex mode)
• For ABAP & SmartForms:
Under SAP this setting can also be specified in the definition of the Output device.
The "Output attributes for list drivers" tab has a setting named "Print mode".
The selectable values are: DEFAULT, SIMPLEX, DUPLEX, and TUMBLE DUPLEX.
This setting is only used by the HPL2 ABAP list driver.
If the standard ABAP list driver is used, the setting has to be specified in the command at [PCL.03] in the "Printer initialization" action in the Device type.
• For SAPscript:
The Duplex mode to be used for a particular page can be specified in the definition of the Form used by the document, under
  "Page layout" -> <page> -> [Attributes] -> "Print attributes" -> "Print mode".
The selectable values are: <empty>, "S", "D", "T".
• For SAPscript and SmartForms under POSS:
The Duplex Mode can be configured using POSS option 04. For more information please refer to the section on POSS in Volume 2.

Note: (Forcing a particular Duplex mode for SAPscript)
As explained above, the desired duplex mode for SAPscript can be specified in the "Print mode" field of the definition of the SAPscript FORM. If it is not desired to assign a fixed duplex mode to a SAPscript FORM, then this field should be left empty, and the desired duplex mode should rather be specified in the "Printer initialization" action of the Device type, at tag [PCL.03]. This is, however, only possible if the SAPscript FORM does not specify a duplex mode yet. If the SAPscript FORM does already specify a duplex mode that is undesired, and if it cannot be changed, please contact Technical support for how to override it.

3.3.1 Tag: # [PJL.17] DUPLEX MODE 1/2

These commands are not necessary.

Command syntax:
• `@PJL SET DUPLEX = ^^^ \r\n`   -- **[PJL.17a]**
• `@PJL SET BINDING = ^^^ \r\n`   -- **[PJL.17b]**

Initial / Example:
• `#@PJL SET DUPLEX = ON \r\n`
• `#@PJL SET BINDING = LONGEDGE \r\n`

Note: If both PJL command and PCL command are sent, the PCL setting takes precedence over the PJL setting.

3.3.2 Tag: # [PCL.03] DUPLEX MODE 2/2

Command syntax:
• `\e&l^^^S`

Initial / Example:
• `#\e&l0S`

3.4 Output Bin

Description:
The output receptacle (bin, tray) for the printed paper.

Settings/Values:

^^^ [PJL.16]	^^^ [PCL.02]	Print control	Interpretation	Capacity (# sheets)
--	0	--	Default output tray (as specified from the device's front panel)	--
UPPER	1	TROST TRO01	Standard Tray	500

3.4.1 Tag: # [PJL.16] OUTPUT BIN 1/2

Command syntax:
• `@PJL SET OUTBIN = ^^^ \r\n`

Initial / Example:
• `#@PJL SET OUTBIN = xxx \r\n`

Note: If both PJL and PCL commands are sent, the PCL setting takes precedence over the PJL setting.

3.4.2 <mark>Tag: # [PCL.02] OUTPUT BIN 2/2</mark>

Command syntax:
- `\e&l^^^G`

Initial / Example:
- `#\e&l1G`

3.5 Job Offset

This feature is NOT supported by this device.

3.5.1 <mark>Tag: # [PJL.13] JOB OFFSET</mark>

This command is NOT supported by this device.

3.6 Stapling

This feature is NOT supported by this device.

3.6.1 <mark>Tag: # [PJL.02] STAPLING MODE</mark>

This command is NOT supported by this device.

3.7 Punching

This feature is NOT supported by this device.

3.7.1 <mark>Tag: # [PJL.03] PUNCHING MODE</mark>

This command is NOT supported by this device.

3.8 Resolution

Description:
By default, the horizontal and vertical printer resolution, in dots per inch (dpi), is 600 dpi.

Settings/Values:

^^^ [(*)]	Interpretation
600	600 dpi

Note: (*): The same value must be set at both places !

3.8.1 <mark>Tag: # [PJL.01] RESOLUTION 1/2</mark>

Command syntax:
- `@PJL SET RESOLUTION = ^^^ \n`

Initial / Example:
- `@PJL SET RESOLUTION = 600 \n`

3.8.2 <mark>Tag: # [PCL.14] RESOLUTION 2/2</mark>

Command syntax:
- `\e&u^^^D`

Initial / Example:
- `\e&u600D`

3.9 Copies

Description:
Number of copies to print of this job.
For example, for 4 copies of a 3-page document,
- **Uncollated** copies will appear as 1,1,1,1,2,2,2,2,3,3,3,3.
- **Collated** copies will appear as 1,2,3,1,2,3,1,2,3,1,2,3.

Settings/Values:
^^^ = { 1,...,999 }

Dependencies/Constraints:
- Please note that this may conflict with some SAP Output Management System software.

Note: (PCL/PJL)
There are two PJL commands and one PCL command related to specifying the number of copies and the collation mode.
Initially, both PJL commands are commented out, and the PCL command specifies 1 copy.
If either PJL command is used, the other one and the PCL command need to be commented out to avoid conflicts.
For Collated mode, the PJL QTY command is needed.
For Uncollated mode, either PJL COPIES or the PCL command can be used.
If both PJL and PCL commands are used, the PCL setting will override the PJL setting.

Note: (Increasing the performance of network printers)

It is possible to specify the desired number of copies directly in the print data stream, using one of the commands below. Since the spool system cannot know the contents of the data stream, it has to be told explicitly that N = 1, to avoid any conflict.

If a certain class of print jobs always requires the same fixed number of copies, the administrator may choose
1. to create a dedicated device type which sends the appropriate command, and
2. to tell his users to always keep N = 1 in the Print parameters dialog.

Note: The above does not work in conjunction with the HPL2 ABAP list driver, since it overrides this setting; it always forces only 1 copy.

3.9.1 Tag: # [PJL.15] COPIES 1/2

Command syntax:
- @PJL SET QTY = ^^^ \r\n   -- **[PJL.15a]** (for Collated)
- @PJL SET COPIES = ^^^ \r\n   -- **[PJL.15b]** (for Uncollated)

Initial / Example:
- #@PJL SET QTY = 1 \r\n
- #@PJL SET COPIES = 1 \r\n

3.9.2 Tag: # [PCL.13] COPIES 2/2

Command syntax:
- \e&l^^^X

Note:
This PCL command will just print uncollated copies.
It needs to be commented out if one of the above PJL commands is used.

Initial / Example:
- \e&l1X

3.10 EconoMode (Toner Saver)

Description:
For draft printouts, the EconoMode can be activated to save toner.
For normal operation, this feature should be deactivated.

Settings/Values:

^^^ [PJL.14]	Interpretation
OFF	disabled (normal printing)
ON	enabled

Note: (The SAP mechanism to specify the EconoMode)

- For ABAP and non-POSS systems:
There is no SAP mechanism.
- For SAPscript and SmartForms under POSS:
The EconoMode can be configured using POSS option 10. For more information please refer to the section on POSS in Volume 2.

3.10.1 Tag: # [PJL.14] ECONOMODE (TONER SAVER)

Command syntax:
- `@PJL SET ECONOMODE = ^^^ \r\n`

Initial / Example:
- `#@PJL SET ECONOMODE = OFF \r\n`

3.11 Auto Tray Change/Switching

Description:
If enabled, and the current tray runs out of paper, the job will be continued from a tray containing the same paper size.
If disabled, the front panel LCD will prompt the user to refill paper and wait.
This should be disabled in case there are e.g. 2 different types of A4 paper (e.g. normal, colored) which should not be mixed.

Settings/Values:

^^^ [PJL.12]	Interpretation
OFF	disabled
ON	enabled

3.11.1 Tag: # [PJL.12] AUTOTRAYCHANGE

Command syntax:
- `@PJL SET AUTOTRAYCHANGE = ^^^ \r\n`

Initial / Example:
- `#@PJL SET AUTOTRAYCHANGE = ON \r\n`

3.12 Edge Smoothing/Enhancement

This feature is NOT supported by this device
.

3.12.1 Tag: # [PJL.11] SMOOTHING

This command is NOT supported by this device.

3.13 Page Protection

This feature is NOT supported by this device.

3.13.1 Tag: # [PJL.06] PAGE PROTECTION

This command is NOT supported by this device.

3.14 Paper Size

Description:

Determines the paper size to be used for the current page.

The **physical height** and **width** of the sheet or envelope are specified below.
The engine's mechanics implies an unprintable area near the edges, so that the **imageable area** is usually smaller. This is device-dependent.

Paper may be treated differently, depending on with which edge the sheets are fed into the paper path (**feed direction**).
- **LEF** = Long-edge-feed

- **SEF** = Short-edge-feed

(This notion of feed direction is independent of the notion of orientation.)
In the paper sizes below the first value specified is the feed edge.

Note: (Configuring the Paper size)
This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.
For a SAPscript document, its paper size is configured in the "Page format" setting in the SAPscript Form used by the document, which in turn determines the Device format to be used. For the SAP standard paper sizes (A3, A4, A5, Letter, Legal, Executive), the command sent is built in the HPL2 SAPscript OTF driver, otherwise (for non-standard paper sizes) it has to be specified at the end of the Printer initialization action of the corresponding Device format.
For an ABAP report, the paper size to be used is always assumed to be A4 or Letter; however, the "Printer initialization" action does not send any paper size command.
In any case, the command syntax is explained below.

Note: ("Sub paper size")
Normally, a print job specifying a certain paper size would require that paper of this size be loaded in a tray.
If paper of this size is not available in any tray, the user will be requested via the device's front panel to load it.
Since A4 and Letter have similar formats, it may be desirable to be able to print a job specifying Letter format on A4 paper, or vice versa. This feature is called "Sub(stitute) paper size". There is no scaling applied; so if the image is too large, it will be cropped at the margins.
This feature can only be set via the device's front panel (Sub Paper Size = Auto); there is no PJL command to achieve this.

Settings/Values:

^^^	Name (short)	Full / Alternative names	EU/US	Size
26	**A4**	DIN A4 (SEF)	EU	210 x 297 mm
24	**A6**	DIN A4 (SEF)	EU	105mm x 148mm
2000	**A5**	DIN A5 (SEF)	EU	148 x 210 mm
25		DIN A5 (LEF)		210 x 148 mm
46	B4	B4(JIS) ((SEF))	EU	257 x 364 mm
45	B5	B5(JIS) (SEF)	EU	182 x 257 mm
2020	B6	B6(JIS) ((SEF))	EU	128 x 182 mm
3	**Legal**	LGL, Legal ((SEF))	US	8.5" x 14"
2	**Letter**	LTR, Letter (SEF)	US	8.5" x 11"
1	**Executive**	Executive (SEF)	US	7.25" x 10.5"
2008	HalfLetter	HLT, Half Letter (SEF)	US	5.5" x 8.5"
		HLT, Half Letter (LEF)		8.5" x 5.5"
2012	Folio	F4 ((SEF))	US	8.25" x 13"
2011	F/GL	F, Folio GL ((SEF))	US	8" x 13"
2007	Foolscap	Foolscap, Folio, F4, Government Legal ((SEF))	US	8.5" x 13"
81	Com-10	Envelope Commercial #10 ((SEF))	US	4.125" x 9.5"
80	Monarch	Envelope Monarch, Commercial #7 3/4 ((SEF))	US	3.875" x 7.5"
91	C5	Envelope C5 ((SEF))	EU	162 x 229 mm
2022	C6	Envelope C6 ((SEF))	EU	114 x 162 mm
2031	16K	16Kai (SEF)	EU/US	195 x 267 mm
2081	OFICIO	OFICIO (SEF)	US	8.5" x 13.4"
101	Custom	Custom / User-defined	--	--

Dependencies / Constraints:
- Some input bins and output bins support only certain paper sizes, and some only in a certain feed direction.
  See the sections about Input bins and Output bins and the chapter "Device Hardware Accessories" above.
- If no paper select command is sent, the controller will use the paper in the addressed tray, or it may ask to load the paper which is currently specified as default.

Note: (Printing envelopes)
To print an envelope, you need to specify these commands:
- (Input bin): The command for the Envelope Feeder or the Bypass tray.
- (Paper size): The command indicated in this section.
- (Orientation): Please note that all envelope sizes require Landscape orientation.

Note: (Support of paper sizes by SAP)
Only the entries marked bold are currently fully supported as standard under SAP.
For the procedure on how to support a non-standard paper size, see the corresponding section in Volume 2, Appendix 1.

Command syntax:
- `\e&l^^^A`

Example:
- `\e&l26A`

3.15 Orientation

Description:

The orientation defines how the printed output appears on the physical paper. By definition, "Portrait" means that, in order to read the text, the sheet must be held upright, i.e. with the short edge at the top. (This notion is independent of the notion of paper feed direction.)

Note: (Configuring the Orientation)
This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.
For a SAPscript document, its orientation is configured in the "Orientation" setting in the SAPscript Form used by the document. The command is automatically sent by the HPL2 SAPscript OTF driver, using the Print controls SPORT and SLAND, after the command sequence of the "Printer initialization" action. Therefore, the "Printer initialization" action should not send any commands to specify orientation.
For an ABAP report, the orientation is a property of the Device format (X_ll_cc), which in turn is determined by the number of lines per page and the number of columns. The necessary PCL command is contained at the end of the "Printer initialization" action.
In any case, the command syntax is explained below.

Settings/Values:

^^^	Interpretation
0	Portrait (P)
1	Landscape (L)

Note: The values are the digits 0,1, NOT the letters O,l.

Dependencies/Constraints:
- For Stapling, Punching, Duplexing, Orientation, and Paper feed direction, only certain combinations make sense and are permitted. See the chapter "Limitations" below.

Command syntax:
- \e&l^^^O

Note: The last character is the uppercase letter "O".

Example:
- \e&l0O

3.16 Left margin

Description:
The left margin of the page.

Note: (Configuring the Left margin)
This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.
For a SAPscript document, the horizontal margins are automatically cleared (set to 0) by the HPL2 SAPscript OTF driver, sending the command "<ESC>9" after the command sequence of the "Printer initialization" action.
For an ABAP report, the horizontal margins are automatically cleared (set to 0) when using the HPL2 ABAP list driver. Otherwise no command is sent.
In any case, the command syntax is explained below.

Settings/Values:

^^^	Interpretation
{ 0,1,... }	Number of columns (as defined by the current HMI)

Command syntax:
- \e&a^^^L

Example:
- \e&a5L

3.17 Top margin

Description:
The top margin of the page.

Note: (Configuring the Top margin)
This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.
For a SAPscript document, the top margin is automatically cleared (set to 0) by the HPL2 SAPscript OTF driver, sending the command "<ESC>&l0E" after the command sequence of the "Printer initialization" action.
For an ABAP report, the top margin is automatically cleared (set to 0) when using the HPL2 ABAP list driver. Otherwise no command is sent.
In any case, the command syntax is explained below.

Settings/Values:

^^^	Interpretation
{ 0,1,... }	Number of lines (as defined by the current VMI)

Command syntax:

- `\e&l^^^E`

Example:

- `\e&l1E`

3.18 Horizontal spacing

Description: (PCL)
The horizontal spacing defines the distance between two adjacent characters.
In a proportional font, it affects only the width of the space character.
The current horizontal spacing is kept in a variable called **HMI** (Horizontal Motion Index).
It has to be specified as an absolute measure in 1/120 inch.
This determines the number of characters per inch (**cpi**).
The default HMI is = 12/120" = 10 cpi.

Note: (Configuring the Horizontal spacing)
This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it. Moreover, after any font select command the HMI is automatically set to a (font-specific) default, and therefore it needs to be specified again.
For a SAPscript document, the horizontal spacing is specified by the HPL2 OTF driver automatically after each font select command of a proportional font (thus only affecting the width of the space character). For fixed-spaced fonts, no command is sent; thus the default pitch of the selected font will be used.
For an ABAP report, the "Printer initialization" action of an X_ll_cc Format contains a command to override the default pitch of the font used (Courier), thus condensing or expanding it to just the right size so that cc columns will fit properly on the page. The HPL2 ABAP list driver sends the command automatically.
In any case, the command syntax is explained below.

Settings/Values:

^^^	Interpretation
{ <any rational number> }	absolute measure in 1/120 inch

Command syntax:

- `\e&k^^^H`

Example:

- `\e&k12H`

3.19 Vertical spacing

Description: (PCL)
The vertical spacing defines the distance between two adjacent lines.
The current vertical spacing is kept in a variable called **VMI** (Vertical Motion Index).
It can be specified as number of lines per inch (**lpi**).
The default VMI is = 8/48" == 6 lpi.

Note: (Configuring the Vertical spacing)
This setting cannot be configured effectively in the "Printer initialization" action of the device type, because there are other mechanisms which would override it.
For a SAPscript document, the vertical spacing is initially set to 0 by the HPL2 SAPscript OTF driver, using the command "<ESC>&l0C".
For an ABAP report, the necessary command is contained at the end of the "Printer initialization" action of the format. The HPL2 ABAP list driver overrides this, setting it to 0.
In any case, the command syntax is explained below.

Settings/Values:

^^^	Interpretation
{ 1,2,3,4,6,8,12,16,24,48 }	number of lines per inch (**lpi**)

Command syntax:

- `\e&l^^^D`

Example:

- `\e&l6D`

3.20 Character set

Description:
Select/change the active printer character set.
This term is also known as "symbol set" (HP) or "code page" (Microsoft).
It is a table that interprets ASCII codes as characters.

Note: (Configuring the Character set)
This setting is not a property of the job or a page but of individual characters. Nor is it an attribute of the font, it is maintained independently. It would make sense to specify an initial value in the "Printer initialization" action of the device type, but it could be overridden at any time.
In a SAPscript document, the character set can be switched by sending an appropriate Print control. (This is currently not implemented.)
This setting is also overridden by the SFxxx font select Print controls issued by the HPL2 SAPscript OTF driver.
For an ABAP report, the initial character set to be used is specified at the end of the "Printer initialization" action.
In any case, the command syntax is explained below.

Settings/Values:

^^^	Interpretation
0N	Latin-1 (ISO 8859-1)
2N	Latin-2 (ISO 8859-2)

For the initial setting, see the Example below.
Dependencies/Constraints:

- none

Note: (Switching the Character set)
At the moment it is not possible to switch between character sets, e.g. to mix both Latin-1 and Latin-2 in the same document.

Note: (Support of the EURO character)
The EURO character (€) has been implemented in the symbol sets 19U (Latin-1), 9E (Latin-2), for most typefaces, except LinePrinter, at position 80 (hex).
For this device the resident fonts support the EURO character.
To find out if the device type supports the EURO character, please see Volume 2.

Command syntax:

- \e(^^^

Example:

- \e(0N   -- for ZA0x1vvv
- \e(2N   -- for ZA0x2vvv

3.21 Font

Description:
Selects the font to be used, by specifying the following parameters:

- ^^^p = proportional
- ^^^h = pitch (cpi)
- ^^^v = font height (point size)
- ^^^s = style (italic)
- ^^^b = weight (bold)
- ^^^T = typeface

Note: (Selecting a font & Configuring font attributes)
This setting is not a property of the job or a page but of individual characters.
It doesn't make sense to specify an initial value in the "Printer initialization" action of the device type, since it will be overridden.
In a SAPscript document, the font to be used for a portion of text is specified by preceding the text with a 2-character tag which is defined as a Character format or Paragraph format in the Form or Style used by the document. The tag maps to a system font and thus to a SFxxx Print control and thus eventually to a font select PDL command sequence.
For an ABAP report, only a fixed-spaced font can be used, in this case COURIER. The font size depends on the format chosen, and it is specified in the "Printer initialization" action of the Device format. The HPL2 ABAP list driver has its own mechanism.
In any case, the command syntax is explained below.
There are no Print controls for changing/specifying a font attribute, because using them would conflict with the existing mechanisms.

Note: (OCR text printing)
Printing OCR text requires a separate solution. Please refer to the chapter "Barcodes & OCR Text" in Volume 2 for more information.

Note: (Barcode printing)
Printing barcodes requires a separate solution. Please refer to the chapter "Barcodes & OCR Text" in Volume 2 for more information.

Note: (Arbitrary size fonts)
For printing fonts in arbitrary sizes, please refer to the chapter "The Fonts" in Volume 2 [ZA0x].

Settings/Values:
Please refer to proper PCL documentation.

Note: The pitch command (<ESC>&k#H) must be respecified after any font select command. Otherwise a (font-specific) default is used.
Note: LinePrinter supports only symbol sets 0N, 2N.

Command syntax:

- \e(s^^^p^^^h^^^v^^^s^^^b^^^T

Example:

- `\e(s0p10h12v0s0b4099T`   -- This would select normal Courier 10 cpi 12 pt.

3.22 Color printing

Description:
There are several parameters which can influence the appearance of color images and text.
- Color/Monochrome mode

Settings/Values:
-- see below

Dependencies/Constraints:
- Color mode is not supported with resolution 300 dpi.
-- see below

Note: (How to specify Text color)
In ABAP, the colors are predefined. In SAPscript, the color of text can be specified as follows:
- For R/3 release 4.6C+, the SmartForms component allows to specify color as an attribute of characters.
- Otherwise, the proprietary Print controls below can be used with this syntax:
   `/:PRINT-CONTROL 'XCxxx'`

Print control -- direct (*)	-- indexed (*)	Color
XCBLU	XCXX4	Blue
XCRED	XCXX1	Red
XCCYA	XCXX6	Cyan
XCYLW	XCXX3	Yellow
XCGRN	XCXX2	Green
XCBLK	XCXX0	Black
XCMGT	XCXX5	Magenta
XCWHT	XCXX7	White

Note: (*)
The direct method specifies RGB values.
The indexed method uses a standard 8-color palette. This method may fail, because the SAPscript OTF driver may change the palette, mapping some colors to Black.

3.22.1 Tag: # [PCL.30] COLOR : COLOR MODE

Description:
This setting determines whether the subsequent output should be monochrome (black-and-white) or color.

Note: (Switching the color mode within a document)
It is possible to switch between the two modes within a SAPscript document.
However, this command always requires a page break, because it affects not only the toner to be used but also the format of the rasterized page bitmap. Therefore, it needs to be immediately preceded by a form feed, as follows:

```
/:NEW-PAGE
(
/:PRINT-CONTROL 'SESCP'
  &b0M
```

Command syntax:

- `\e&b^^^M`

Settings/Values:

^^^ [PCL.30]	Print control	Interpretation
0	XCLR1	Color
1	XCLR0	Monochrome (Black-and-white)

Initial / Example:

- `#\e&b0M`

3.23 Slip sheet

This feature is NOT supported by this device.

3.23.1 Tag: # [PJL.20] SLIPSHEET

This feature is NOT supported by this device.

3.24 Locked Printing

Description:
Locked printing allows to defer the printing out of the sheets of a job until the recipient has walked up to the device and entered a password.

Note: (The SAP mechanism to specify Locked Printing)
- For ABAP and non-POSS systems:
There is no SAP mechanism.
- For SAPscript and SmartForms under POSS:
Locked Printing can be configured using POSS option 09 ("User Authentication"). For more information please refer to the section on POSS in Volume 2.

Note:
Currently this feature can only be configured via POSS.
If it is needed for printing from ABAP or in a non-POSS environment, please contact Technical Support.
Also in case of different requirements regarding the job parameters displayed, please contact Technical Support.

Note: (The procedure under POSS)
To issue a job as locked, the password (of 4..8 alpha-numeric characters) has to be specified upon the creation of the job. Under POSS this has to be done at the "User Authentication" option. Note that, when entering the password, it will not be masked.
For how to release a locked job on the device, i.e. to print it out, refer to the device's Operating Instructions manual. On the panel, the job can be identified by its user id. Our Device type is designed to automatically assign the SAP login name of the creator of the Output request as the user id. For technical reasons, the entries appear with the fixed date "2001/12/31" and time "23:59". Note that a job that was specified with invalid syntax in the job password (e.g. too long), cannot be accessed on the device, even though it appears in the list; the entry can only be removed by rebooting the device.

Note: (Cover page)
Together with the Locked printing feature, a cover page should not be specified ! This is because the cover page would be generated as a separate locked print job with the same password. And, a cover page is actually not necessary for printout identification purposes, since the recipient has to walk up to the machine anyway.

3.25 Edge-to-Edge Mode

Description:
Normally there is a margin along the edges of the sheet.
If this setting is enabled, the logical area for printing almost equals the physical size of the paper; the margins are reduced to approx. 1 mm.
For normal operation, this feature should be disabled.

Settings/Values:

^^^ [PJL.07]	Interpretation
NO	disabled (default)
YES	enabled

Note:
The physical printable area may vary depending on the paper size.

3.25.1 Tag: # [PJL.07] EDGE-TO-EDGE MODE

Command syntax:
- `@PJL SET EDGETOEDGE = ^^^ \r\n`

Initial / Example:
- `#@PJL SET EDGETOEDGE = NO \r\n`

3.26 USERCODE

Description:
The USERCODE feature allows to tag a print job with a numeric code which identifies the job as having been issued by a certain individual (user) or organizational unit (department, etc.).
This can be used   for accounting or billing purposes, for usage statistics, or for user authentication.
For how to register the codes on the devices and how to evaluate the statistics, refer to the corresponding Operating Instructions manual.

Settings/Values:
The length of the code is max. 8 digits.
The surrounding double-quotes (") are mandatory.
The value of the code can be specified as static/fixed or as dynamic/variable.

In our ZAxx Device type, initially a fixed value is specified as an example.
For how to assign variable codes dynamically at print time, please contact technical support.

Dependencies/Constraints:
- If the value is too long (> 8 digits), it will not be truncated, but the parameter will be empty !
- If the value contains an invalid character, i.e. a non-digit, the parameter will be empty !

3.26.1 Tag: # [PJL.24] USERCODE

Command syntax:
- `@PJL SET USERCODE = "<usercode>" \r\n`

Initial / Example:
- `#@PJL SET USERCODE = "01234567" \r\n`

3.28 Job Separation

This feature is NOT supported by this device.

3.28.1 Tag: # [PJL.27] JOB SEPARATION

This command is NOT supported by this device.

4. Limitations

There are no device-specific or controller-specific limitations related to combinations of several features.
For **device-specific limitations of a single feature**, see under "Dependencies/Constraints" of the corresponding section above.
For **device-independent limitations** related only to the SAP device type used, please refer to the "Limitations" chapter of the corresponding Volume 2.

5. (Appendix 1): Printer Languages

This chapter gives a brief introduction of each printer language used by the printer controllers of our devices.

5.1 PCL

The HP **PCL Printer Language** (PCL) is a **page description language** (PDL).
That means it is used to specify the contents and format of a page.

The general syntax of a PCL command is:
*   `<ESC> <character> <letter> <value> <letter>`

Note:
*   Please be aware that the syntax is case-sensitive.
*   In `"\e&l^^^H"` etc., `"l"` is the lowercase letter "L" not the digit "1" !
*   In `"\e&l^^^O"` etc., `"O"` is the uppercase letter "O" not the digit "0" !
*   Do NOT introduce any extra blanks.

PCL5e is the version that most of our black-and-white devices use.
PCL5c is the version that our color devices use.

For detailed information, please refer to the "PCL5 Printer Language Technical Reference Manual" from HP.

5.1.1 PCL macros

PCL allows to define and execute **macros**. A macro is identified by a number (<#>).
*   `<ESC>&f<#>y0X`   start define macro #
*   `<ESC>&f<#>y1X`   stop define macro #
*   `<ESC>&f<#>y2X`   execute macro #
*   `<ESC>&f<#>y3X`   call macro #

5.2 PJL

The HP **Printer Job Language** (PJL) is a **job control language**.
That means it controls parameters of a whole job, not of individual pages.
Normally all PJL commands are sent at the beginning of a job, and then it switches to some page description language.

The general syntax of a PJL command is:
*   `@PJL SET <keyword> = <value> [<CR>]<LF>`

Note:
*   Please be aware that the syntax is case-sensitive.
*   The white spaces in front of and behind the "=" sign are optional.
*   Do NOT introduce any blanks behind the <CR><LF>.

For detailed information, please refer to the "PJL Technical Reference Manual" from HP.

6. (Appendix POSS): Support of POSS options for [DC122]

The following table shows the support of POSS options and option values on this device model.

Legend: **+** = supported, **o** = optional (supported if device hardware option), **--** = not supported.

Value	PCL	Description	Supp.
	[PCL.01]	L \p<POSSOPT:**01**> -- **Input bin**	+
		\e&l_H	
-1	8	Tray 1	+
-2	1	Tray 2	o
-3	4	Tray 3	o
-4	30	Tray 4	o
-15	23	Tray 5	--
-16	24	Tray 6	--
-17	25	Tray 7	--
-5	5	LCT (Large Capacity Tray)	--
-21	2	Bypass	+
-31	26	Tray T1	--
-32	27	Tray T2	--
-33	28	Tray T3	--
-34	29	Tray T4	--
-90	7	Auto Tray Select	+
	[PCL.02]	L \p<POSSOPT:**02**> -- **Output bin**	--
		\e&l_G	
-1	1	Inner Tray 1 (Lower Tray) (Standard Tray)	--
-2	100	Inner Tray 2 (Upper Tray) (Internal Tray 2)	--
-3	101	Finisher Shift Tray	--
-4	2	Finisher Proof Tray	--
-5	102	Finisher Booklet Tray	--
-6	103	Right Tray	--
-10	3	Mailbox Proof Tray	--
-11	4	Mailbox Tray 1	--
-12	5	Mailbox Tray 2	--
-13	6	Mailbox Tray 3	--
-14	7	Mailbox Tray 4	--
-15	8	Mailbox Tray 5	--
-16	9	Mailbox Tray 6	--
-17	10	Mailbox Tray 7	--
-18	11	Mailbox Tray 8	--
-19	12	Mailbox Tray 9	--
-21	105	Stacker 1	--
-22	106	Stacker 2	--
	[PCL.30]	L \p<POSSOPT:**03**> -- **Colour mode** -- only if [color model]	+
	[PCL.03]	L \p<POSSOPT:**04**> -- **Duplex mode** -- only if [dpx unit]	+
	[PJL.13]	C \p<POSSOPT:**05**> -- **Job separation**	--
	[PJL.03]	L \p<POSSOPT:**07**> -- **Punching mode**	--
	xxx // yyy	@PJL SET PUNCH=xxx // @PJL SET PUNCHHOLE=yyy	
-10	LEFTPORT // JP2	Left Edge (2 holes EU) (req LEF/SEF)	--
-20	TOPPORT // JP2	Top Edge (2 holes EU) (req SEF/LEF)	--
-11	LEFTPORT // EU4	Left Edge (4 holes EU) (req LEF/SEF)	--
-21	TOPPORT // EU4	Top Edge (4 holes EU) (req SEF/LEF)	--
-12	LEFTPORT // US2	Left Edge (2 holes US) (req LEF/SEF)	--
-22	TOPPORT // US2	Top Edge (2 holes US) (req SEF/LEF)	--
-13	LEFTPORT // US3	Left Edge (3 holes US) (req LEF/SEF)	--
-23	TOPPORT // US3	Top Edge (3 holes US) (req SEF/LEF)	--
-14	LEFTPORT // NEU4	Left Edge (4 holes NE) (req LEF/SEF)	--
-24	TOPPORT // NEU4	Top Edge (4 holes NE) (req SEF/LEF)	--

-90	OFF	Off	–
	[PJL.02] (...)	L \p<POSSOPT:**08**> -- **Stapling mode**	**–**
	xxx	@PJL SET STAPLE= xxx	
-1	LEFTTOP	Top-Left Corner	–
-3	LEFT2PORT	Left Edge (req LEF/SEF)	–
-4	TOP2PORT	Top Edge (req SEF/LEF)	–
-2	LEFTTOPSLANTPORT	Top-Left Corner (Slanted) (may req SEF/LEF)	–
-5	STAPLELESSLEFTTOPSLANTPORT	Top-Left Corner (Slanted & Stapleless)	–
-90	OFF	Off	–
	(...)	U \p<POSSOPT:**09**> -- **User password**	**+**
	(...)	C \p<POSSOPT:**10**> -- **Vendor-defined 1: Draft print (Toner Saver)** -- only if not [color model]	**+**