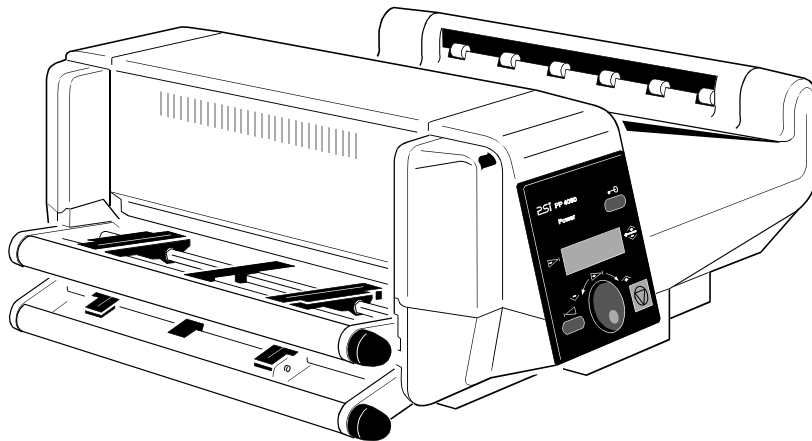


User's Manual

PP 4050
PP 4050XP
PP 4050MICR
PP 4650



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Great care has been taken to ensure that the information in this handbook is accurate and complete. However, should any errors or omissions be discovered or should any user wish to make suggestions for improving this handbook, please feel encouraged to send us the relevant details.

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Safety Regulations for the Laser Printer PP 4x50 and PP 4050XP and the intelligent Paper Stacker iPS 4050E

The LED printers **PP 4050**, **PP 4050MICR**, **PP 4050XP**, **PP 4650** and the **intelligent Paper Stacker iPS 4050E** fulfils the safety regulations according to IEC, VDE/GS, and UL / C-UL for information technology equipments (EN 60950, UL 1950 3rd Edition / CAN/CSA C22.2 No 950-95).

Note: The commercial name of the **iPS 4050E** is **iPS 4050/4060**).

The mains cable must be connected to a ground protected wall-socket. The printer's voltage has to be in accordance with the local mains voltage.

The power plug must be easily accessible at any time so that it can be disconnected immediately in case of danger or for maintenance purposes.

Before installing the printer, check the surrounding conditions in which the printer is intended to be used (see next page, Operating Environment).

During thunderstorm you should never attempt to connect or disconnect any data transfer cable.

The power supply should only be opened and checked by authorized personnel. Maintenance beyond the descriptions of chapter 5 may only be attempted by authorized personnel. Repairs done inappropriately may seriously jeopardize the user's safety.



Attention: This symbol is standing for a hot surface - **danger of burning!**

Safety Regulations

Electromagnetic Compatibility

We certify that the equipment at issue,

Type: **Printer PP 4050**, **PP 4050MICR**, **PP 4050XP**, **PP 4650** and the **intelligent Paper Stacker iPS 4050E**

corresponds to the laws and regulations ruling electromagnetic compatibility of appliances (89/336/EEG) and, therefore, fulfils the requirements for conformity marking with the CE-sign.

To guarantee that the device stays within the limits according to the approval regulations for conducted and radiated emission (EN 55022, Class B) and immunity (EN 55024) in any case shielded interface cables are to be used only.

Note: This equipment has been tested and found to comply with the limits for a **CLASS A** digital device pursuant to **Part 15** of the **FCC Rules**. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes and modifications not explicitly allowed by the equipment's manufacturer could void the user's authority to operate the equipment.

Operating Environment

Avoid installing the printer where it is exposed to moisture or heat (eg. direct sunlight).

The printer is designed to operate in a wide range of environmental conditions.

- Temperature: + 15 °C to + 35 °C (+59 °F to + 95 °F)
- Humidity: 30% to 50%

For best performance, store and use fanfold paper at 19° to 23° C (68° to 73°F) and a relative humidity of 33 to 47 percent.

Note: In case of higher values for temperature and humidity the print quality will degrade!

Power Requirements

- 100 - 110 V (-10/+6%) AC, 12 A (average)
- 100 - 110 V (-10/+6%) AC, 12 A (average)
- 110 - 120 V (-10/+6%) AC, 12 A (average)
- 220 - 240 V (-10/+6%) AC, 6 A (average)
- 50 - 60 Hz

Note: To avoid an overload of the electric circuit support (particularly for 100 to 110 or 110 to 120V) connect the power supply plug of the printer into a separate protected power wall socket.

Power Consumption

- Operating power < 1.200 Watt average; (<1.650 W peak during Warming Up)
- Operating current < 100 Watt
- Power save ≤ 45 W

Notes: Slots and openings in the printer's housing are provided for ventilation. Always ensure that these openings are not obstructed.

Also ensure that the cables of the printer do not interfere with the output paper path.

During the printing process ozone will be produced. Take care that the printer is standing in a room with good ventilation. The limit of ozone concentration should be **0,1 ppm (0,2 mg/m³)**. Note that the specific gravity of ozone is higher than that of air.

Caution: Danger of explosion if battery is incorrectly replaced!
Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the batteries manufacturer's instructions.

The intelligent Paper Stacker iPS 4050E can only be used in conjunction with the printer PP 4050, PP 4050MICR, PP 405XP, PP 4060 or PP 4650.

Caution: Connector not located in limited Power Source! Only for connecting Paper Stacker (iPS 4050E). Refere to User's Manual.



Caution, the chain of the motor to move the paper exit tray up and down will start automatically or after pushing the key at the front side of the table.



Caution, the paper exit tray moves up and down automatically or after pushing the key at the front side of the table. Keep your feet clear when the paper exit tray moves down. Ensure that the cables at the rear of the printer do not interfere with the paper path within the stacker.

The feet of the laser printer PP 4050, PP 4050MICR, PP 4050XP or PP 4650 should be positioned into the depressions of the stacker's table.

Note: Open windows, airing, and also draught disturb the paper flow!

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Preface

About this Manual

This manual covers the printer in combination with the interface module, the Personality Module. The Personality Module (PM) is an integral part of the printer which determines the functionality of the printer especially regarding the user and system interface.

The structure of this manual is such that the operator is led step-by-step through the various procedures. Starting with unpacking and installation of the consumables it moves on to setting-up configuration parameters and ends with the mounting of options.

The manual is divided into the following chapters:

1. Installing the Printer and intelligent Paper Stacker

This chapter covers the information about the basic elements of the printer. The next steps show how to power on the printer, the handling of the tractor cassettes, inserting fanfold paper, and how to operate the intelligent Paper Stacker (iPS 4050).

2. Operating the Printer

This chapter discusses in great detail the operation of the control panel, all menu functions, and the general operation of the menu. General status messages are also described.

3. Configuring the Printer

This chapter explains how to use the Profiles and to configure the printer so that it can communicate with the corresponding system environment. Further on this chapter includes a view of the Menu Structure and thoroughly describes in a short form the printer's operating controls. Finally you will find a description of the Configuration Programs **Profiler 4050** and **Profile Selector 4050**. The Profiler 4050 is a menu controlled program and supported the printer configuration via PC. Different configurations can be downloaded into the printer.

Profile Selector 4050 is a program for quick access to a profile.

4. Explanation of Individual Menu Items

In this chapter are the individual menu items are explained in detail.

5. Maintenance

This chapter explains how to replace the consumables and maintain the printer.

6. Trouble Shooting and Diagnostics

suggests how to identify and correct simple problems.

7. Technical Data

All technical details or data about the printer can be found here.

8. Paper Specification

Guidelines, Specification, Paper and Label properties are defined in this chapter.

9. Maintenance / Logbook

All activities of maintenance should be written down here.

Appendix A Programming Guide

This appendix describes command extension of PCL5 and PJJ in section 2 and 3. Bar Code Programming is described in section 5.

Appendix B Symbol Sets

All supported Symbol Sets are listed.

Appendix C Miscellaneous


- Order Numbers
- Printer Driver

Safe Energy

The PP 4x50 printer models have a special feature to save power. After a specified period of inactivity, the printer changes to a low power state. When a print job is received, the printer resumes the operating mode. This function is changeable in the Configuration Menu with the item **POWER SAVE**. Standard setting is 15 minutes.

Conventions Used in this Guide

The following conventions are used:

Bold	Headlines and important information.
<i>Note:</i>	Contains special advice to facilitate handling.
<i>Caution:</i>	Contains important information to prevent damage of the equipment.
[ENTER]	Key functions are always depicted in brackets or indicated by the corresponding symbol e.g.  .

The use of **LEFT** and **RIGHT** always assumes you are viewing the front i.e. the control panel of the printer. For instance, the paper input is at the LEFT side of the printer.

Installing the Printer and intelligent Paper Stacker

1.1 Requirements to the location of the printer

In this chapter the preconditions are described concerning the environment, the physical prerequisites, and the demand for space which are required for installation of the printer.

1.1.1 Environmental conditions

– Temperature and Humidity

The following table shows the values of temperature and relative humidity which are specified for the printer and its consumables.

	Temperature	Relative Humidity
Print operation * Optimum range	+ 19 to + 23 °C + 68 to + 73 °F	33 to 47%
Print operation Extended range	+ 15 to + 35 °C + 56.5 to + 86 °F	30 bis 50%
Transport and Storage of the printer	- 10 to + 40 °C - 4 to + 104 °F	max. 95% (at + 40 °C or + 104 °F)
Transport and Storage of the consumables **	- 10 to + 40 °C - 4 to + 104 °F	max. 95% (at 40 °C or 104 °F)
Storage of fanfold paper	+ 19 to + 23 °C + 68 to + 73 °F	33 to 47%

* The photoelectrical process in a laser printer is influenced by the climatic conditions of the environment. The herewith specified values define a climate in which an optimal print quality is ensured. Operating the printer outside this range may lead to a reduction of the print quality.

** It is recommended to store the consumables at a cool and dark location.

– Altitude

The printer can be used at an altitude up to 2,135 m (7,000 ft.).

– Air circulation

In general there are no restrictions concerning air circulation. However, it is to be observed that the air flow does not move the fanfold paper heavily at the paper entry and paper exit of the printer and such may lead to paper jams.

In conjunction with the paper stacking system care has to be taken that the air flow does not disturb a proper operation of the stacker.

– Impact of Light and Sunshine

Since the printer is equipped with a light-sensitive photoconductor drum and optical sensors it shall in general not be installed at a location which is exposed to sunlight. If not otherwise possible window shades have to provide for the necessary protection.

Note: The printer must never be installed such that its right side (paper exit) points to a window.

If the top cover is opened to clear a paper jam or to perform maintenance actions sunbeams would directly fall onto the photoconductor drum and would permanently destroy its surface after an impact period of about 1 minute.

– Acoustical Noise

The upper limits of the acoustical noise are shown below.

- Print Operation ≤ 55 dB(A)
- Stand-by ≤ 48 dB(A)

– Power Dissipation

If an interruption of a print operation occurs the printer can enter the Power Save mode when for a certain period of time whose duration is selected at the operator panel the printer does not perform any further operation. In this mode most of the printer's subsystems are disconnected from power. The operating mode is resumed when the printer receives further data from the host system.

Mode	Power Consumption
Operating	< 1,200 Watt average < 1,650 Watt max.
Stand-by	< 100 Watt
Sleep Mode (Power Save)	≤ 45 Watt

– Weight and Dimensions

The printer's weight is 112 kg (247 lbs.) with all consumables included.
The printer and the optional intelligent paper stacker both together weigh 164 kg (361 lbs.).

– Dimensions

	Printer	Printer incl. Stacker System
Width	810 mm; 32.9 inch	1.040 mm; 40.9 inch
Height	350 mm; 13.8 inch	1.140 mm; 44.9 inch
Depth	780 mm; 30.7 inch	780 mm; 30.7 inch

– Accessibility

To facilitate the handling of the printer (and the stacking system) by the operator the below mentioned distances around the printer should be met minimally:

- Front 700 mm / 27.6 inch
- Rear 140 mm / 5.5 inch
- Left 480 mm / 18.9 inch
- Right 400 mm / 15.8 inch

Note: The intelligent paper stacker is equipped with castors which allow to move the entire configuration to an empty space in case of maintenance activities.

– Preconditions for Installation

Floors and doors must be wide enough that the printer can pass them; corners and angles must be large enough such that the printer can be turned if necessary. For example a door must be 80 cm (31.5 inch) wide minimally.

Elevators must be able to carry the printer and the personnel who transport it. Doors of the elevators must be wide enough that the printer can pass them.

It must be ensured that the floor space where the printer is to be installed does not exceed the following horizontal inclinations:

- from the front to the rear $\pm 1^\circ$
- from the left to the right $\pm 2^\circ$

It must be safeguarded that an approved mains voltage wall socket is available which provides for correct and sufficient current; the mains cord must extend to the wall socket.

1.2 A First Look at the devices

- | | |
|--------------------------------|------------------------------------|
| 1 Laser Printer | 2 Rear Cover |
| 3 Paper Exit for Cut Sheets | 4 Top Cover |
| 5 Paper Exit for Fanfold Paper | 6 Front Cover |
| 7 Control Panel | 8 Lower Tractor |
| 9 Upper Tractor | 10 intelligent Paper Stacker (iPS) |
| 11 Pendulum | 12 Paper Exit Tray |
| 13 Shelf for Lower Tractor | 14 Shelf for Upper Tractor |
| 15 Castors | |

Note: The intelligent Paper Stacker (10) - also called **iPS 4050/4060** - is an option!



Note: The Printer drivers for Windows® are available - see Appendix C Order Numbers.

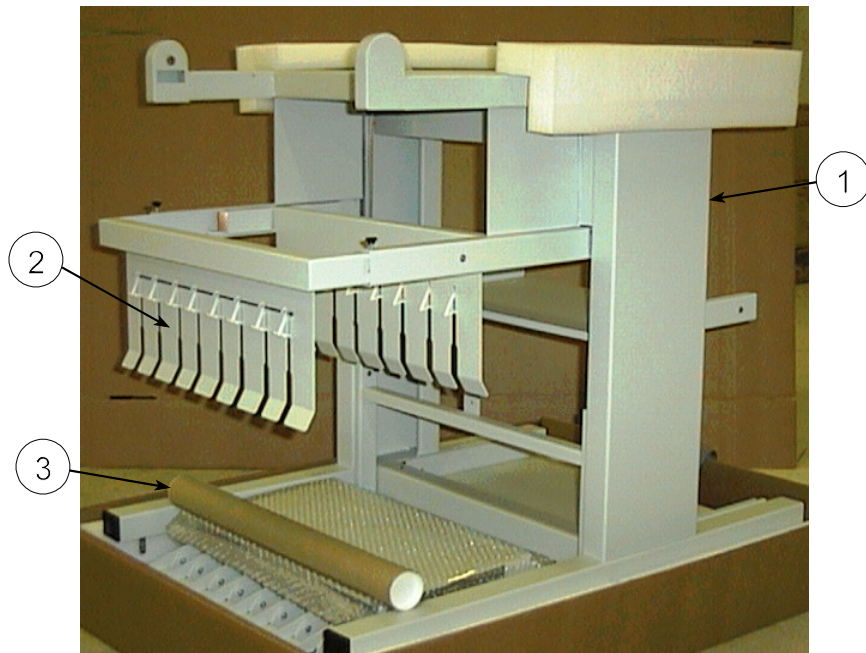
1.3 Installing the intelligent Paper Stacker

1.3.1 Check delivery for completeness

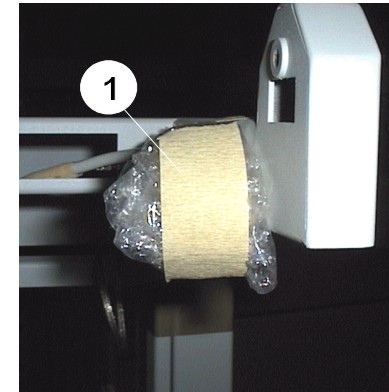
When unpacking, check contents of delivery by item against the list detailed below. Contact your delivery agent immediately if any item is missing or damaged.

The iPS 4050/4060 package should contain the following:

- iPS 4050/4060 basic unit (1)
- Pendulum (2)
- a box with the left and right Paper Guide (3)
- four Castors



Note: Remove the transport locks and mount the four castors.
Observe that the two castors with locking lever are mounted at paper entry side.



- The interface connector and protective ground cable are packed into a plastic bag (1).

1.4 Installing the Printer

1.4.1 Check delivery for completeness

When unpacking, check contents of delivery by item against the list detailed below. Contact your delivery agent immediately if any item is missing or damaged

The **Starter Kit** package should contain the following:

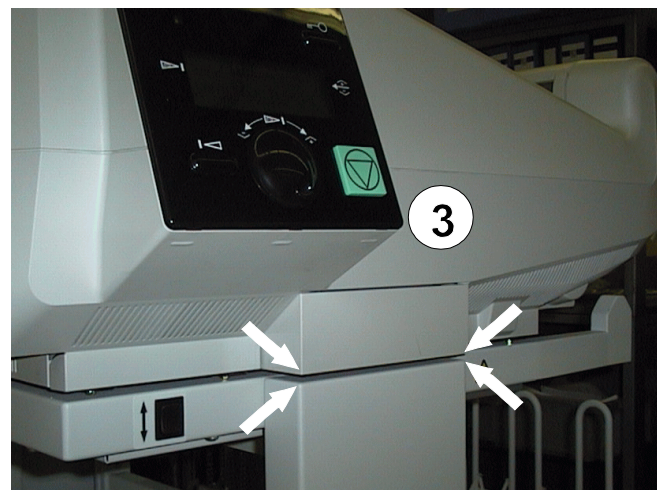
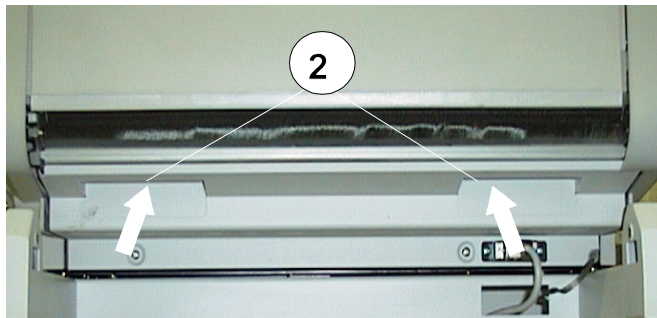
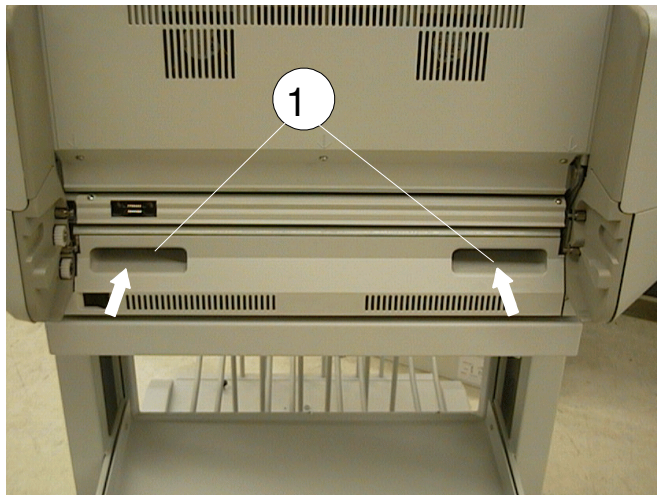
- 1 x Developer Unit incl. Toner Cartridge
- 2 x Tractor Cassettes
- 1 x PC-Cartridge
- 1 x Cleaner Felt
- 1 x Ozone Filter
- 1 x Toner Cartridge
- 1 x User's Manual
- 1 x Mains Cable
- 1 x Waste Toner Bottle

1.4.2 Put the Printer onto the intelligent Paper Stacker (iPS 4050/4060)

- Lift the printer from the pallet using the transport grip points on the left (1) and the right side (2) of the printer and put it onto the iPS 4050/4060.

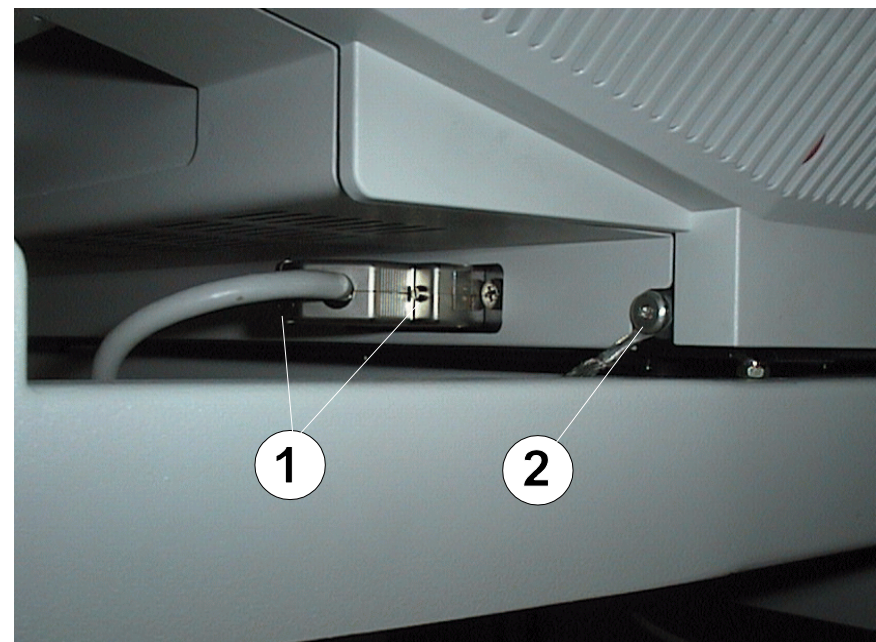
Note: Do not attempt to lift the printer in any other manner!

- Position the printer properly (3) into the depressions and make sure the side covers adequately clear the iPS 4050/4060 frame when opened.



1.4.3 Interconnect the Printer and iPS 4050/4060

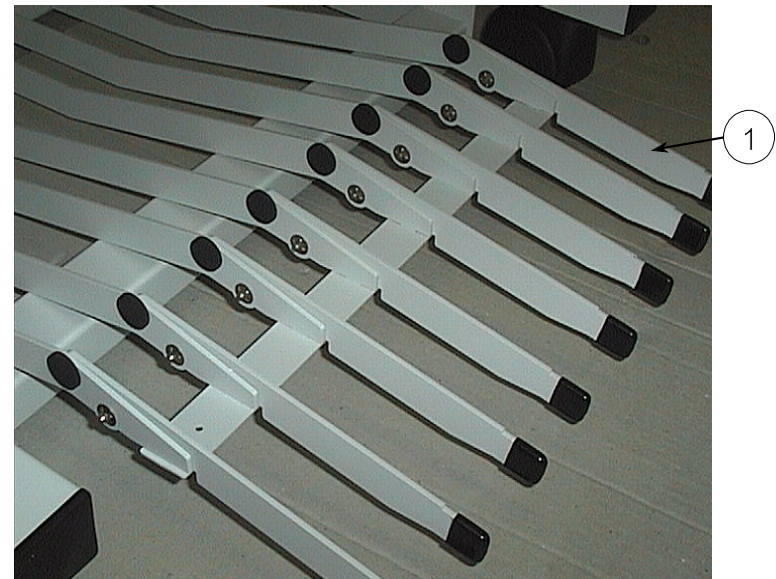
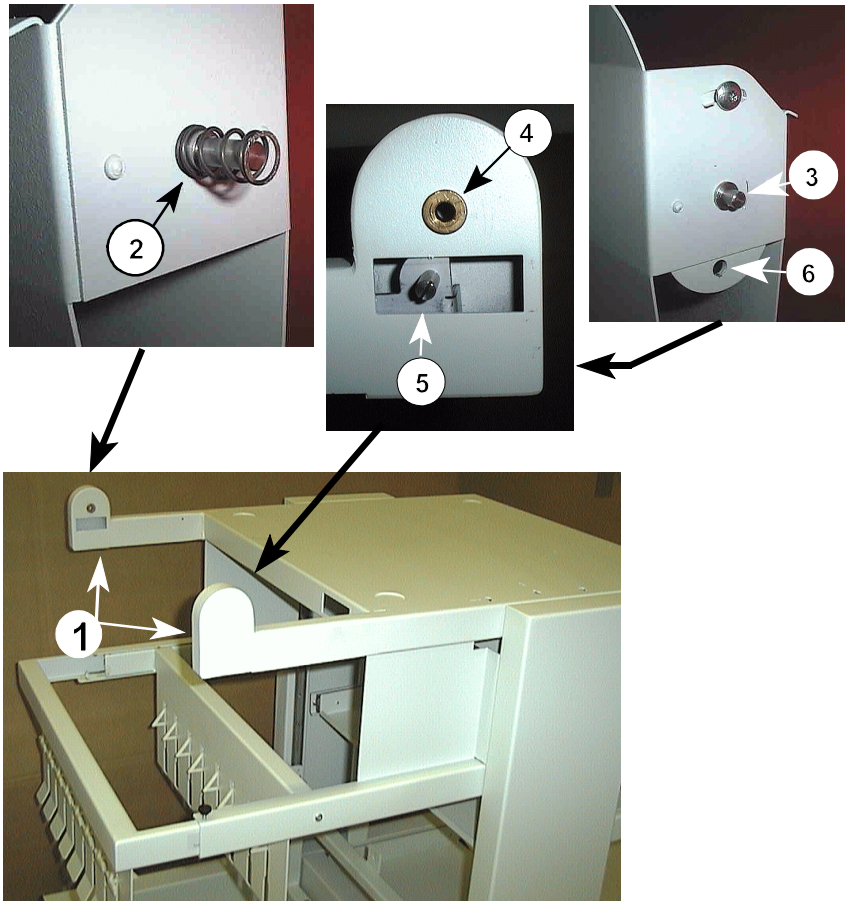
- Make sure that the printer and the iPS are powered off
- Plug in the interface connector (1) and fix it properly
- Connect the protective ground cable (2)



1.4.4 Mount the pendulum of the iPS 4050/4060

The printer must be put onto the iPS first before mounting the pendulum. The pendulum is to be mounted vertically between the bars (1).

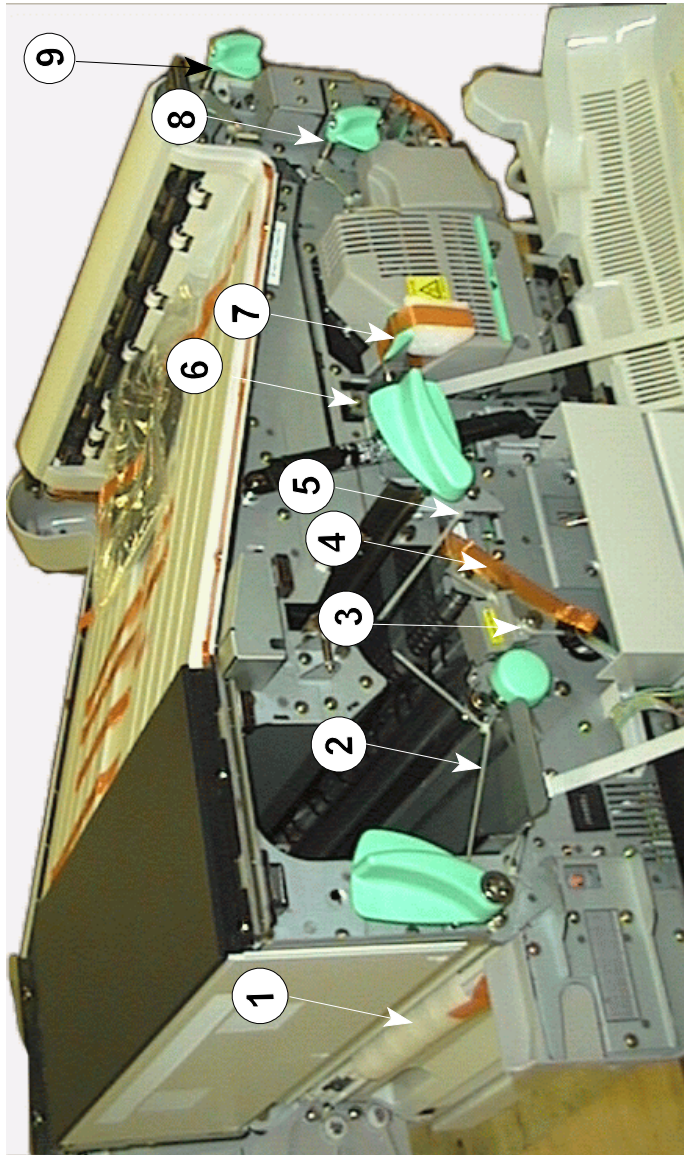
- Shift pendulum (2) into the left stacker bearing by compressing the spring while simultaneously inserting the bolt (3) of the pendulum into the right bearing (4). Take care that the pin (5) hits the hole (6).



- Open the extensions (1) of the paper tray.

1.4.5 Remove the Transport Locks

- Open the front cover at the Operator Panel side
- Remove the foil (1) which protects the paper sensors in both paper paths.
- Remove the transport locks (2), (3), (5), (6), (8), and (9) which fix the levers.
- Remove the bubble wrap (4) which protects the rollers at the paper entrance of the Fuser.
- Remove the foam block (7) which locks the lever of fuser.



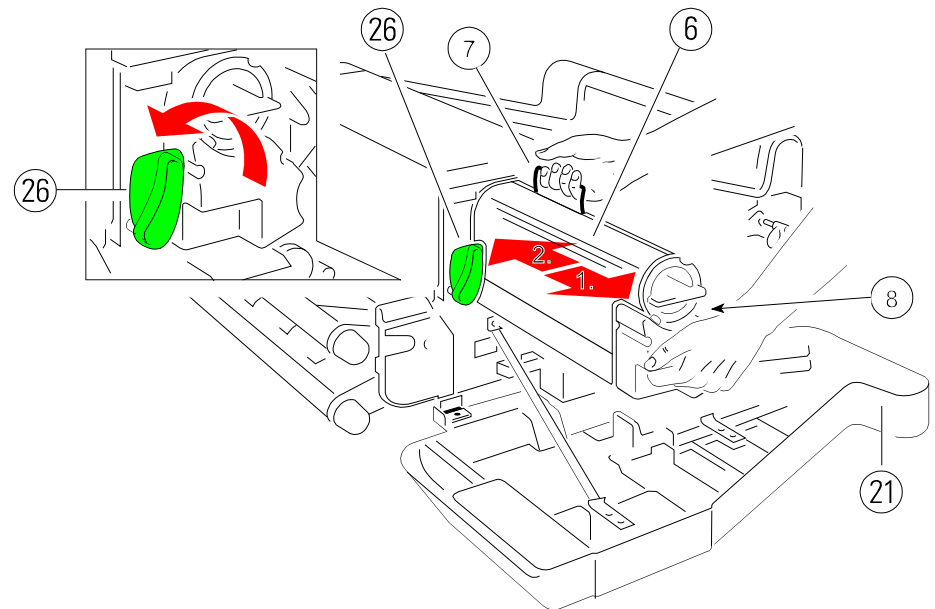
1.5 Installation of the Consumables

1.5.1 Loading the Developer Unit

- Lift the lever (26) upwards to unlock the Developer Unit.
- Pull the Developer Unit (6) about $\frac{2}{3}$ out of the housing and grasp the grip (7) with one hand and remove it.
- Remove the plastic bag from the clutch on the rear side.
- Remove plastic and paper safety strips (8) from the area of the toner output of the Developer Unit (6).

Note: Don't destroy the small plastic lip above the toner output of the Developer Unit (6).

- Insert the Developer Unit (6) (step 2.) and secure it by pressing down the lever (26).



1.5.2 Loading the Toner

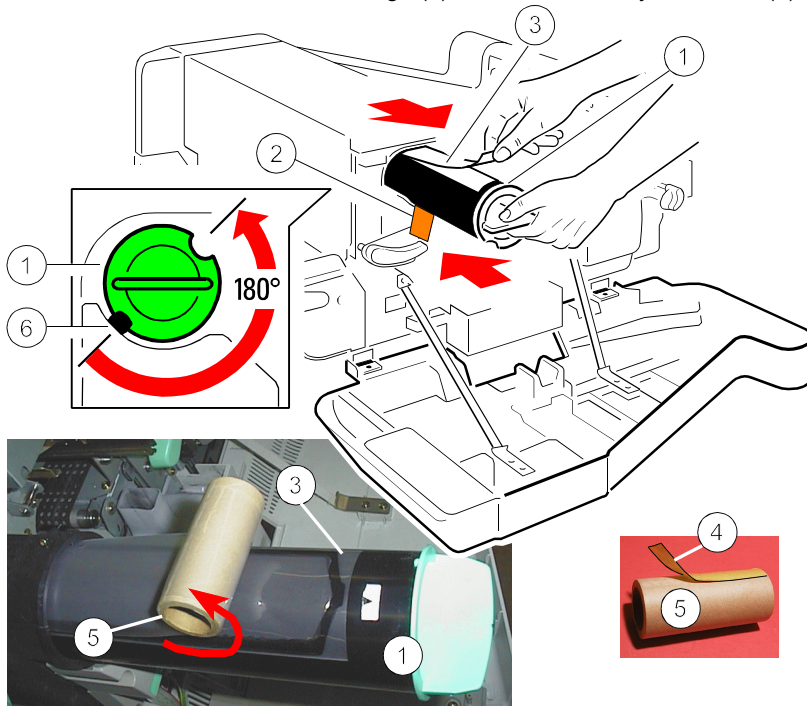
There is a Toner Cartridge in the Developer Unit.

- Pull the Toner Cartridge (1) completely off the developer.

Note: An orange tape (2) is visible which is fixed to a foam block that closes the toner entrance into the developer.

- Remove the foam block (2) from the Developer Unit.
- Shake the Toner Cartridge several times.
- Insert the Toner Cartridge (1) approximate 10 cm, illustrated below, with the attached plastic seal (3) pointing to the top .
- Remove the stripe (4) from the cardboard roll (5) and fix it at the begin of the plastic seal tape (3) .
- Turn the cardboard roll (5) to roll up the plastic seal (3) until the seal is entirely removed and push the toner cartridge until it is fully inserted.
- Turn the Toner Cartridge (1) counter clockwise by about 180 degrees until it is fully engaged.

Note: The cover of the Toner Cartridge (1) must be locked by the screw (6).

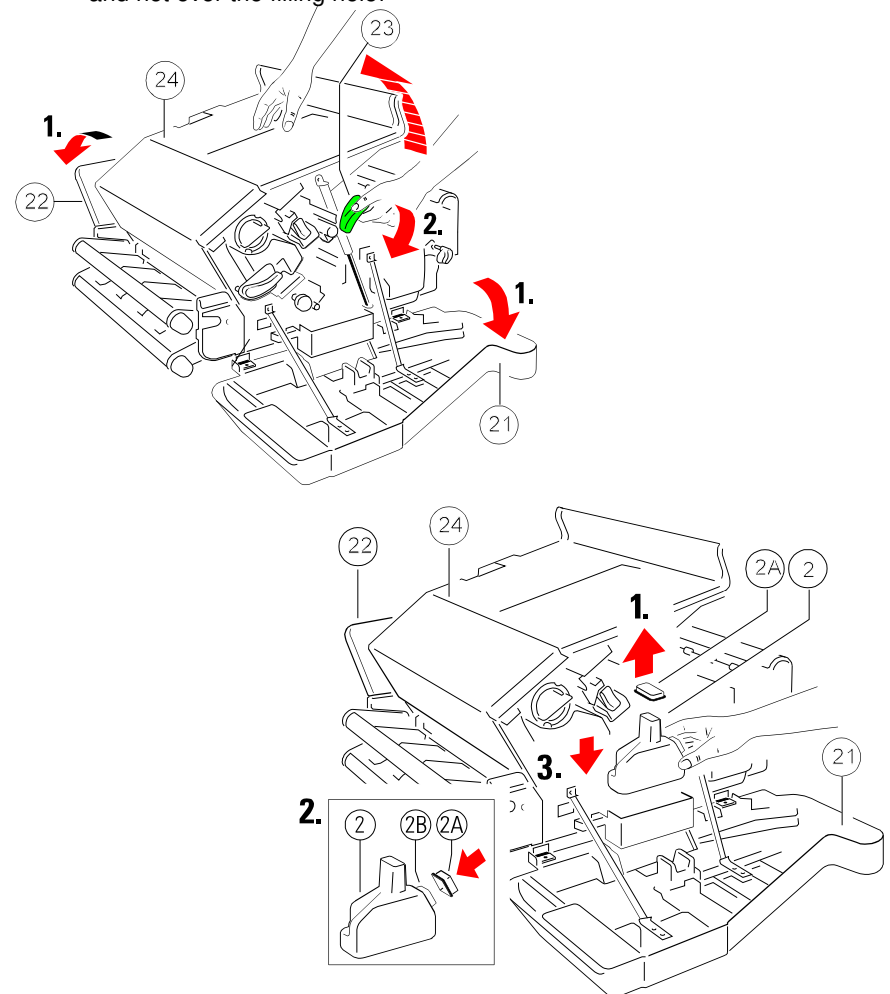


1.5.3 Inserting the Waste Toner Bottle

The Waste Toner Bottle is in the Starter Kit package 1

- Open the rear (22) cover.
- Press the lever (23) to open the top cover (24), illustrated below.
- Take the Waste Toner Bottle (2) and put it into the compartment.

Note: Please make sure that the cap (2A) is placed onto the cap holder (2B) and not over the filling hole!

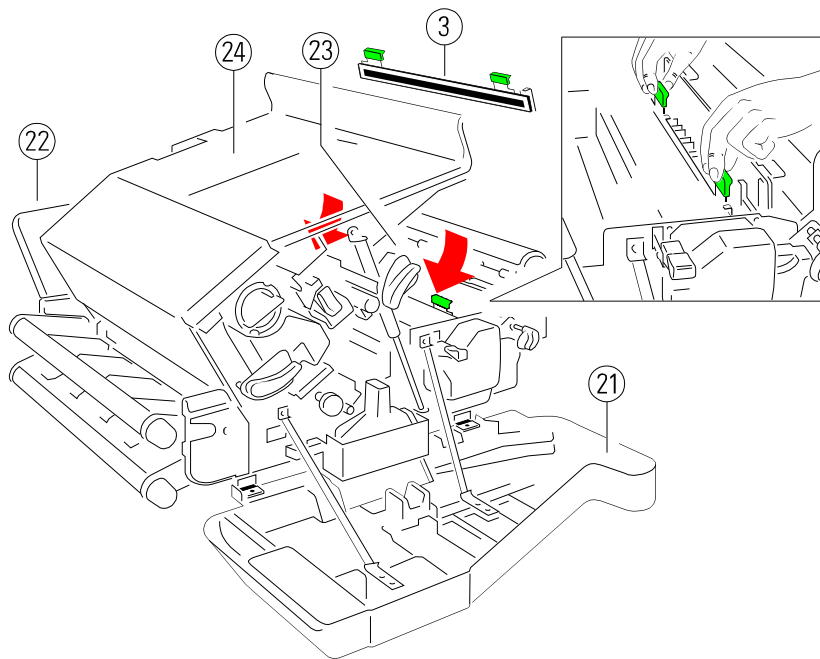


1.5.4 Inserting the Cleaner Felt

The Cleaner Felt (3) is in the Starter Kit package 2

- Insert the Cleaner Felt (3).
- Close the top cover (24).

Note: Depending on paper properties it may be necessary to change the Cleaner Felt more often than with every second Toner Cartridge.

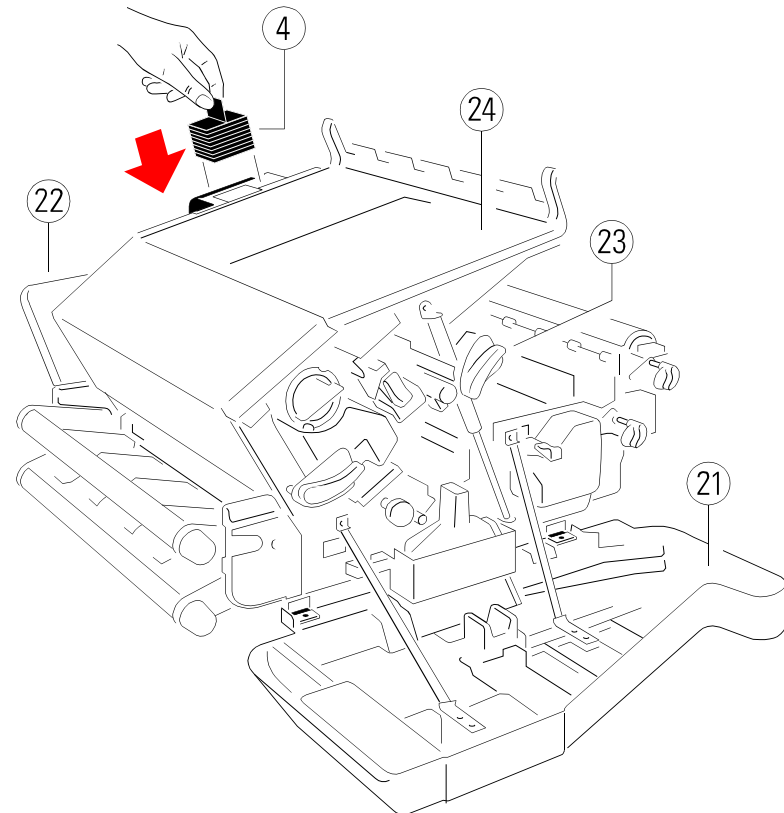


1.5.5 Inserting the Ozone Filter

The Ozone Filter is in the Starter Kit package 1

- Insert the Ozone Filter (4) into the slot.
- Close the rear (22) cover.

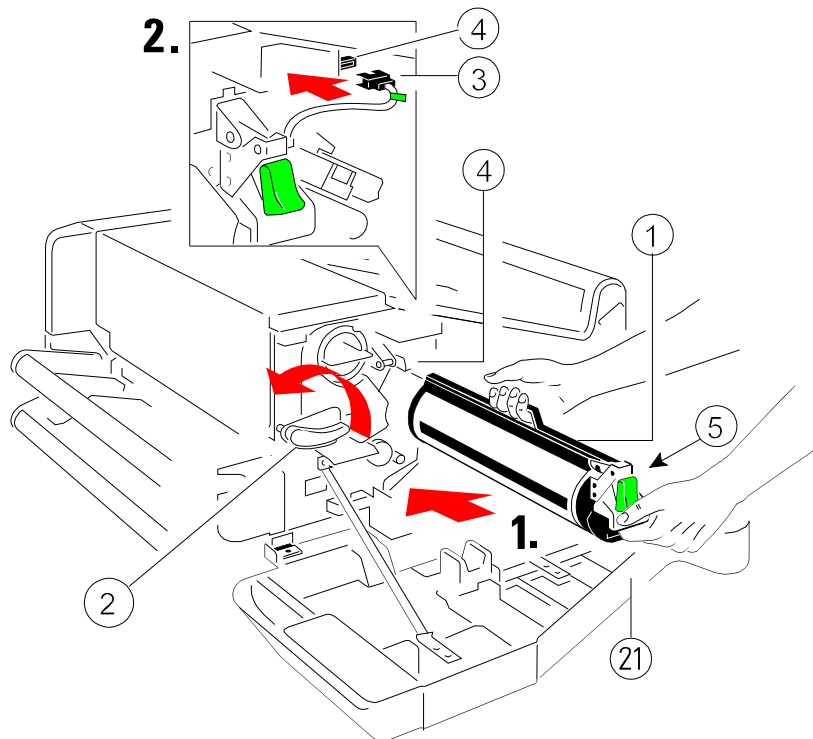
Note: After printing 20,000 pages it is recommended that the Ozone Filter is replaced. The box of the Toner Kit contains the Ozone Filter.



1.5.6 Installing the PC Cartridge (OPC)

The Photoconductor (1) is in the Starter Kit package 2

- Note:**
- The Photoconductor is very light-sensitive, so it is wrapped in a lightproof foil.
 - Please do not touch the green part of the Photoconductor with your fingers. Oil and dirt degrade the print quality.
 - Do not expose the light-sensitive Photoconductor to room lighting or sunlight any longer than necessary.
- Lift the lever (2) upwards to unlock the Developer Unit.
 - Carefully remove the drum from its foil container.
 - Insert the Photoconductor (1) by using the upper and lower iron band guides and push it into the printer until you hear a **click**.
 - Attach the electrical connector (3) to position (4).
 - Find the orange adhesive tape on the waste toner exit and remove it (5).
 - Secure the Developer Unit by pressing down the lever (2).

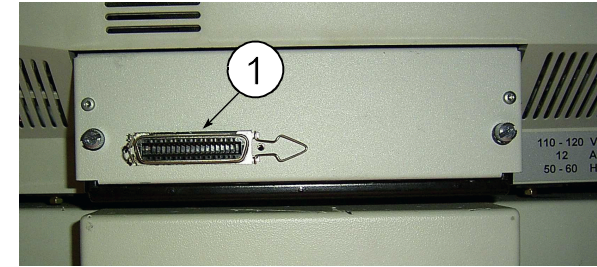


1.6 Connection to a Computer or to a Network

Note: The printer must be powered off!

1.6.1 PP 4050 Parallel Interface

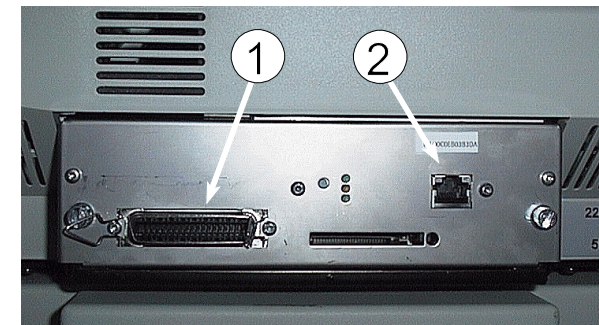
At the rear side of the printer you will find the Parallel IEEE 1284 (1) interface connector.



1.6.2 PP 4050XP Parallel and Ethernet Interface

At the rear side of the printer you will find two interface connectors:

- Parallel IEEE 1284 (1)
- Ethernet 10 Base T (2)

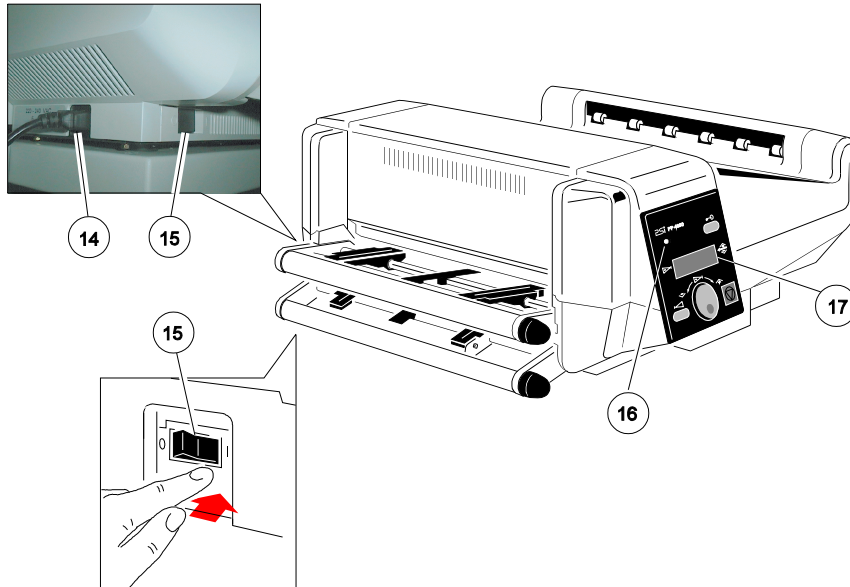


- Connect the interface cable coming from the computer or from the network to the printer's parallel (1) or 10 Base T port (2).
- Check in the CONFIG. MENU the **HOST CHANNEL**.
 - For the parallel connection the setting **PARALLEL ONLY** is necessary.
 - To activate the 10 Base T interface the setting must be **I/O EXTENSION**.

Note: For detail information about the Ethernet interface see the included Ethernet Reference Manual.

1.7 Power ON/OFF Switch

- Connect the printer to the mains using the power cord (14).
- The power ON/OFF switch (15), can be found in the housing under the lower tractor cassette to the rear of the printer, switches the printer's power supply ON or OFF.



When switched **ON** the printer performs an internal self test which checks the electronics, fans, and the motors for the paper transport mechanism.

The display (17) presents the message:

MEMORY TEST!
PLEASE WAIT ...

After successful completion two messages pop up shortly after each other:

OFFLINE (1)

.....
.....

PCL

Then all fields of the display will show black squares and a short beep sounds; power **ON** is indicated by a green LED (16).

The following message appears:

ONLINE (1)

.....
.....

02 WARMING UP

After a short delay the message **WARMING UP** in line 4 will disappear.

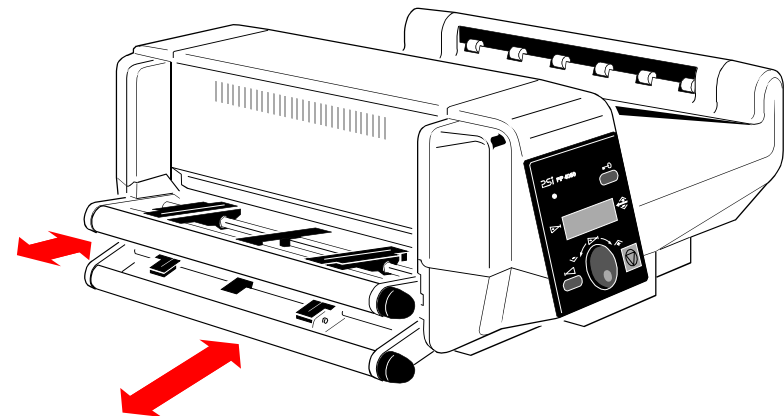
Note: If an error message is displayed please refer to section 6.2 **Error Messages**.

1.8 Handling the Tractor Cassettes

The printer has two tractor cassettes for fanfold paper, the **LOWER TRACTOR** cassette and the **UPPER TRACTOR** cassette. The tractor cassettes are in the Starter Kit Package 1 and 2

If the printer is used without the intelligent Paper Stacker, align the printer with the front edge of the table. Ensure that the cables at the paper exit do not block the paper path.

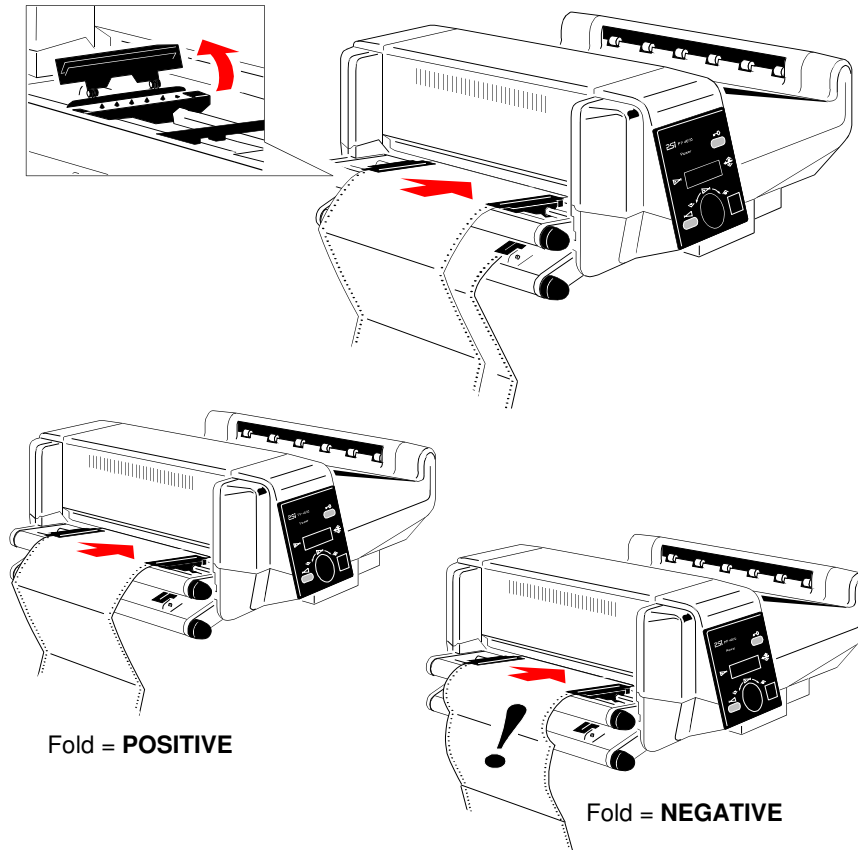
Simply slide the tractor cassettes forward into the respective guides (see illustration). Remove the tractor cassettes by lifting and pulling them toward you. Take out the **UPPER TRACTOR** before inserting paper into the **LOWER TRACTOR**. If more than two different fanfold papers are to be processed, it is useful to work with additional tractor cassettes. Such an additional tractor cassette can be preloaded with paper and quickly mounted into the printer as required.



1.9 Inserting Fanfold Paper

Insert the paper as shown in the illustration; the top edge of the paper must be close to the paper guide. (About **three transport punches** behind the last transport pin of the tractor.)

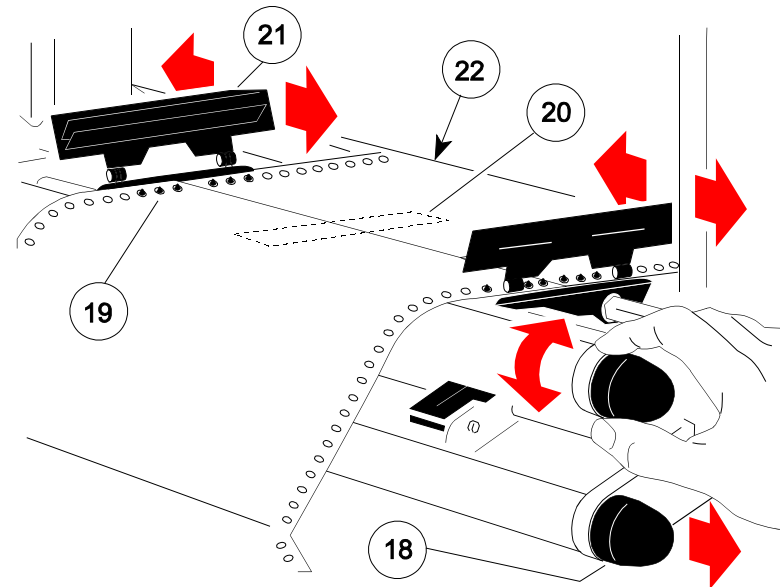
Check that the fold points outwards behind the first page (default setting for **SELECT FOLD = POSITIVE**). If not tear off one page or change the setting for **SELECT FOLD** to **NEGATIVE** (see chapter 4 **Explanation of Individual Menu Items**).



Note: Paper must only be inserted while the printer is powered on!

Inserting paper for the first time or changing to another paper width:

1. Pull out and turn the knob (18) to the right (small paper) or left (wide paper) to adjust the tractors to the paper width, and center the paper support (20) between the tractors.
2. Open the tractor covers (21), insert the paper, and close one tractor cover again.
3. Turn the knob (18) for final adjustment of the paper. The pins (19) of the tractor must be centered in the transport punches of the paper. Close the other tractor cover.
4. Turn the tractor until the top edge of the paper digs into the paper guide (22). (or put the paper already into the paper guide (22) during inserting).



Note: The top edge of the paper must be close to the paper guide (22). (About **three transport punches** behind the last transport pin of the tractor.) The pins (19) of the tractor must be centered in the transport punches of the paper.

1.10 Operating the intelligent Paper Stacker

Correct operation of the stacker is only ensured if the fold behind the first page is positive i.e. the fold points towards the operator. If the fold is negative (it points to the printer) the first page must be torn off.

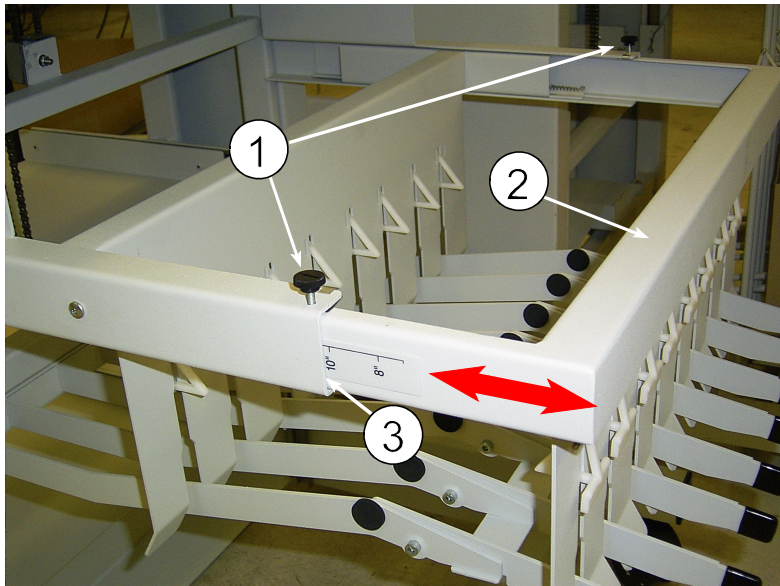
Note: The before mentioned procedure is only necessary for inserting new paper (e.g. a new pile of paper or newly inserting the paper after paper jam). See also chapter **1.9 Inserting Fanfold Paper** on the previous page.

1.10.1 Adjusting the Paper Exit Tray

To stack the paper precisely the intelligent Paper Stacker needs to be adjusted to the paper length. This is done by means of the metal frame at the rear. To set the paper length perform the following steps:

- Loosen the two adjustment screws (1)
- Move the bar (2) until the required length is visible on the ruler (3).
- Tighten the adjustment screws (1).

Note: The adjustment range for the paper length is from 7 inch up to 17 inch.



1.10.2 Remove Paper

There is a switch (25) at the front of the table (below the operator panel) which causes the paper exit tray (26) to move up and down.

Move the paper exit tray down and remove the paper. After 30 seconds or when a next print job is processed the paper exit tray is lifted automatically into the operating position.

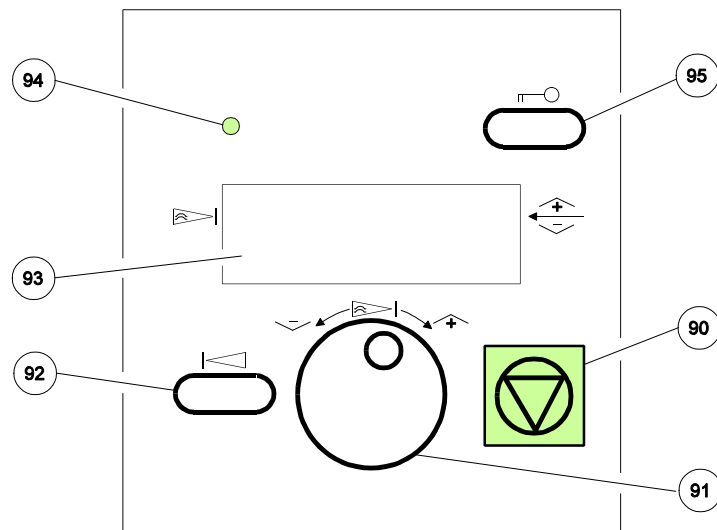


2 Printer Operation

2.1 Control Panel

The control panel

- gives information about the printer status
- controls various parameter settings
- allows manual control of the paper handling



2.1.1 Description of the two Indicators

- **The 4-line Liquid Crystal Display (LCD) (93)** indicates the current status of the printer. If any error occurs (e.g. COVER OPEN) the resulting error message will be displayed. While configuring the printer menu settings and parameters appear on the display.
- **The green indicator lamp (94)** is lit if the printer is supplied with power by setting the power ON/OFF switch to ON.

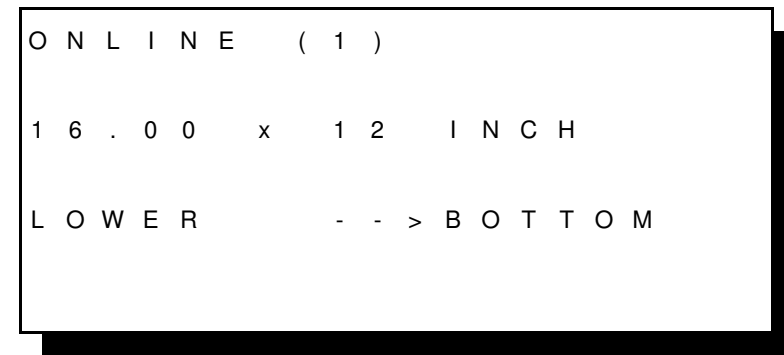
2.1.2 Description of the LCD Indicator

The LCD Indicator gives information about the status of the printer.

In general it can be distinguished between:

- ONLINE messages
- OFFLINE messages

When the printer is in the **ONLINE** mode the display shows:



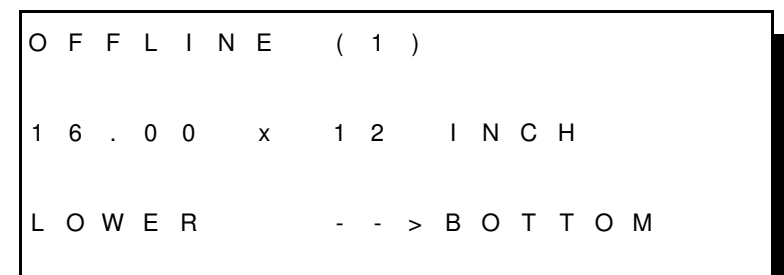
In line two the selected paper format is shown and in line three the selected paper input and paper output.

Note: The value after **ONLINE** is the indication of the actual **PROFILE**.

When the printer is in the **OFFLINE** mode status information, error messages, or menu messages are displayed.

Example: The display content after paper jam.

Note: The printer status gets OFFLINE when a failure occurs.



```

1 3   J A M   L O W E R   I N P U T

```

The error message in line four is flashing and the printer is sending a short acoustic signal.

Note: The value behind **OFFLINE** indicates the last selected **PROFILE**.

Example: The printer is warming up.

```

O N L I N E   ( 1 )
1 6 . 0 0   x   1 2   I N C H
L O W E R           - - > B O T T O M
0 2   W A R M I N G   U P

```

Example: The printer receives data for a print job.

```

O N L I N E   ( 1 )
1 6 . 0 0   x   1 2   I N C H
L O W E R           - - > B O T T O M
                        D A T A


```

Example: Display content after pressing  (90).

```

O F F L I N E   ( 1 )
  S E L E C T   P R O F I L E
  C U T       F O R M
  F O R M     F E E D

```

In this state it is possible to turn  (91) to shift next following lines onto the display.



- SELECT FOLD LOWER
- SELECT FOLD UPPER
- CHANGE PROFILE
- BASIC SETTINGS
- TEST MODE
- RESET PRINTER

Example: Select Profile

```

O F F L I N E   ( 1 )
  S E L E C T   P R O F I L E
  C U T       F O R M
  F O R M     F E E D


```


Example: By turning  (91) the desired menu point is showing in line two. After selecting the menu point **Select Profile** by pressing  (91) you get the following information:

```


S E L E C T   P R O F I L E
  1                                           *
  2
  3

```

By turning  (91) the display contents change to the values available 1 up to 10 (PP4050) resp. 1 up to 50 (PP 4050XP/PP 4650) (only three of them are displayed at a time).

Example: After selecting the desired **Profile Number** (for example 10, because this number stands in line two) press the key  (95) and the following information is getting:




After pressing  (90) the printer use Profile number 10.

2.1.3 Function Keys


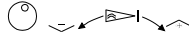


The function of the four keys (90) to (92) and (95) depends on the printer operation state.

Short Description of Keys in the **ONLINE** mode

Number	Key	Function
90		OFFLINE <ul style="list-style-type: none"> - changing to OFFLINE mode - stops data transfer - stops printing

Note: In the **ONLINE** mode all other keys have no function.

Short Description of Keys in the **OFFLINE** mode

Number	Key and Symbol	Function
90		ONLINE <ul style="list-style-type: none"> - changing to ONLINE mode (after an error message) - starts data transfer - leaving the Menu Mode
91		<ul style="list-style-type: none"> - Quick set up wheel to activate a cut function after a print job is terminated without automatic cut. - navigation through the menu (turn) - selection of parameters (press)
92		<ul style="list-style-type: none"> - return to the higher menu level
95		<ul style="list-style-type: none"> - confirm and save the selection

Note: All newly selected values must be confirmed and saved immediately by pressing the key (95)!

2.2 Menu Mode

All operator selected features are accessible via the control panel and combined in the printer MENU.

This feature provides:

- easy handling of configuration (language, etc.)
- quick parameter changes
- activation of test functions

There are four entry points:


- SELECT PROFILE - for profile selection (1 up to 50)
- CHANGE PROFILE - to change the profile settings
- BASIC SETTINGS - to control the printer (power save, menu access)
- TEST MODE - to make test prints and get information about the printer

The menu has three levels:

- Level 1 the Main Function
allows the selection of a group of subfunctions
- Level 2 Subfunctions
can be activated as a function or allow to choose a group of values
- Level 3 Parameters and values
can be selected/activated in this level

2.2.1 To Activate the Menu

To activate the menu, please follow the next steps:

- Press 



The printer enters from the **ONLINE** mode into the **OFFLINE** mode and the display shows


OFFLINE (1) The number in brackets indicates the actual profile!
SELECT PROFILE
CUT FORM
FORM FEED

The next, but not visible items are:


FEED MULTIPLE PAGES
 SELECT FOLD LOWER
 SELECT FOLD UPPER
 CHANGE PROFILE
 BASIC SETTINGS
 TEST MODE
 RESET PRINTER

Selection of functions and parameters at a certain menu level:



- Turn the quick set up wheel  with the symbol  to the left or right; the button has a wrap around function, i.e. after the last item the first item is repeated.

After selecting **CHANGE PROFILE** by pressing the quick set up wheel  you have entered the main function level of the Menu Mode:

CHANGE PROFILE (1)
PAPER MENU
PCL MENU
GENERAL MENU

To switch to the next level first scroll the requested menu item into line two (below the head line). Then press the quick set up wheel .

Now you are at the Subfunction level. Movement in both directions is possible by:


- pressing the quick set up wheel  to enter the next lower level
- pressing the key  to enter a higher level.

If the selection is e.g. **PCL MENU** the display will indicate:

PCL MENU
FONT NUMBER
PITCH
SYMBOL SET


The next, but not visible items are:

LINE SPACING
 TOP MARGIN
 LEFT MARGIN
 RIGHT MARGIN
 TEXT LENGTH
 PERF. SKIP
 \$\$ COMMANDS


Now select the requested menu item of this menu (for example **PERF. SKIP**) by turning the with the quick set up wheel  and press the same button to enter the lowest level.

At the last level to select/confirm values, the asterisk (*) at the right indicates the actual selection.


PERF. SKIP
OFF *
ON

By turning the quick set up wheel  to the left or right you are able to change from OFF to ON.

2.2.2 To Confirm and Save Selection

- press  ; the confirmed value is displayed with an asterisk (*) in the last position.

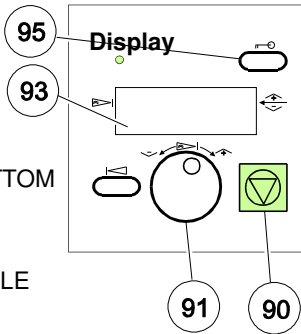





Note: All newly selected values must be confirmed and saved immediately by pressing this key!

The Menu Mode is left by pressing the  key.


Note: All actual parameter settings can be printed with the function **SELF TEST** in the **TEST MODE**.

2.2.3 Example to Start a Self Test

Panel keys are now used and associated display messages are shown for the next steps. The following example demonstrates how to do so:

Key		
1. Switch the printer on.	ONLINE (1) 16.00 x 12 INCH LOWER --> BOTTOM	
2. Press  (90)	OFFLINE (1) SELECT PROFILE CUT FORM FORM FEED	
3. Turn  (91) until	OFFLINE (1) TEST MODE RESET PRINTER SELECT PROFILE	
4. Press  (91) <i>select the TEST MODE</i>	TEST MODE TEST MENU INFO MENU	
5. Press  (91) <i>select TEST MENU</i>	TEST MENU PANELTEST SELF TEST CONT SELF TEST	
6. Turn  (91)	TEST MENU SELF TEST CONT SELF TEST CONFIG. PRINT	

Note: The number in brackets behind ONLINE or OFFLINE indicates the selected Profile.




Key	Display
7. Press  (91) <i>activate SELF TEST</i>	TEST MENU SELF TEST * CONT SELF TEST CONFIG. PRINT

The printer starts to print using paper from the defined paper source.

8. Press  (90)	ONLINE (1) 16.00 x 12 INCH LOWER --> BOTTOM
---	---

Note: The Self Test informs about all settings of the actual Profile (see Paragraph **3.2 Printout off Standard Configuration**).

To cut the SELF TEST-Page, please execute following steps:

9. Press  (90)	OFFLINE (1) SELECT PROFILE CUT FORM FORM FEED
10. Turn  (91)	OFFLINE (1) CUT FORM FORM FEED SELECT FOLD LOWER
11. Press  (91)	OFFLINE (1) CUT FORM * FORM FEED SELECT FOLD LOWER

3 Configuring the Printer

3.1 What is Configuring ?

This chapter describes how to use the control panel and menu to set up or configure your printer so that the printer and your computer system can communicate correctly with each other.

The important menus are:

- SELECT PROFILE
- CHANGE PROFILE
 - PAPER MENU
 - PCL MENU or HEXDUMP MENU
 - GENERAL MENU
- BASIC SETTINGS
 - CONFIG. MENU
- TEST MODE
 - TEST MENU
 - INFO MENU

3.1.1 Profiles

All parameters which characterise a print job and its corresponding form (e.g. **SOURCE, PAPER LENGTH, DESTINATION, FUSER TEMP.**) are contained in one profile. In total **10 PROFILES** (for PP4050) and **50 PROFILES** (for PP4050XP/4650) are available and can be either programmed via the operator panel or by means of the utility called **Profiler**. The profiler provides an utmost comfortable way of creating profiles. More about the Profiler 4050 on next page.

There are two items in the **OFFLINE MENU** which deal with profiles, **SELECT PROFILE** to activate a profile and **CHANGE PROFILE** to define its contents. All parameter settings via the operator panel, via the Profiler 4050 or via PJJL commands are effecting the actually selected profile. The number of the actually selected profile is shown in the first line of the operator panel. After switching on the printer the last selected profile will be active.

The function **RECALL FACTORY** in the **CONFIG. MENU** is setting all parameters of all profiles to the factory default values.

Different applications use also different settings. All these settings for an application are collected in a **PROFILE**. For example: Application A needs fanfold paper cut into single sheets with a top margin of one, application B processes fanfold paper in a batch with a top margin of six. Simply by pressing **SELECT PROFILE** the Profile containing the information for the specific application requirements can be activated.

- **Profiler 4050** and **Profiler 4050/4060/4650**

The Profiler 4050 represents a utility which can be used for printer configuration. It provides the capability to program up to 10 profiles (for PP 4050 and 50 profiles (for PP 4050XP/4650) whose contents can be defined and archived on a PC and downloaded into the printer. All relevant configuration parameters are presented on the screen in a similar way as they are shown on the printer's operator panel display. The utility runs under Windows 95 / 98, Windows NT, Windows ME, Windows 2000 and Windows XP.

Attention: The printer must be in the **ONLINE** state when profiles are downloaded from the PC.

Note: For detailed description of the Programm see Paragraph **3.6 Configuration Tools**.

3.1.2 Basic Printer Settings

All parameters which characterise general printer features and functions can be defined in the menu mode **BASIC SETTINGS** and the submenu **CONFIG. MENU**.

3.1.3 Test Mode

- The **TEST MENU** allows running of various self tests and configuration print outs.
- The **INFO MENU** allows the print out of all release informations of the printer.

3.2 Printout of Standard Configuration

The factory default configuration can be printed within the **TEST MENU** and is shown on the following page.

The upper part of the **SELFTEST** printout shows the actual selections and parameter values.

Main functions appear in the first line of each menu block.







Second and following lines show the selection at subfunction level and the selected parameters behind the "=" sign.

Below the menu section on the test page information is given about the hardware and software configuration of the printer and stacker is given:

- FLASH memory size for printer firmware and fonts
- memory size (DRAM)
- Printer and Stacker firmware version
- Panel version
- available emulations



The rest of the page is filled up with a diagonal test pattern. The black frame around the test page reflects the actual paper format. The default format is 12 inch for paper length and 16 inch for image width.

3.2.1 How to Start the SELF TEST

	Key	Display
1.	Switch the printer ON	ONLINE (1) (after initialisation) 16.00 x 12 INCH LOWER --> BOTTOM
2.		OFFLINE (1) SELECT PROFILE ...
3.	 turn until	OFFLINE (1) TEST MODE ...
4.	 press the button	TEST MODE TEST MENU INFO MENU
5.	 press the button	TEST MENU PANEL TEST SELF TEST CONT SELF TEST
6.	 turn to the right	TEST MENU SELF TEST CONT SELF TEST CONFIG. PRINT
7.	 press the button	TEST MENU SELF TEST * ...

The printer starts to print the self test.

The printer returns to the operating mode after pressing .

Note: If the printer is in the **ONLINE** mode press , select **CUT FORM**, and press  to cut the page!

3.3 Printout of the Profiles

After selecting **CONFIG. PRINT**, the printer starts to print **all 10** resp. **50** Profiles.

Sample of **PROFILE** 1

```

--- Configuration (Active) ----> Profile 1 ---

OFFLINE MENU
SELECT PROFILE      = 1
CUT FORM
FORM FEED
FEED MULTIPLE PAGES= 1
SELECT FOLD LOWER
SELECT FOLD UPPER
CHANGE PROFILE
MAIN SETTINGS
TEST MODE
RESET PRINTER      = NO

GENERAL MENU
EMULATION          = PCL
AUTO FORM FEED     = OFF
AUTOMATIC CUT      = OFF
JOB SEPARATION     = OFF
TRACTOR CHANGE CUT = ON
REPRINT LAST PAGE  = OFF

TEST MENU
PANELTEST
SELF TEST
CONT SELF TEST
CONFIG. PRINT
PCL TYPE LIST

PAPER MENU
PAPER              = CUSTOM
PAPER LENGTH       = 12 INCH
LENGTH FACTOR      = 1
IMAGE WIDTH        = 8.25 INCH
SOURCE             = LOWER
DESTINATION         = BOTTOM
ORIENTATION         = CONTRAIT
LANDSCAPE MODE     = REVERSE
ORIENT. MODE       = FIXED
PAPER EXTENDED     = NO
PAPER SELECTION    = ONLY PJL
PAPER PATH SELECT. = RECOGNIZE
FUSER TEMP.        = MIDDLE
TONER DENSITY      = MIDDLE
VER SHIFT          = 0/100 INCH
HOR SHIFT          = 0/100 INCH
CUT SHIFT          = 0/100 INCH
INIT LINE REGISTR. = 1

CONFIG. MENU
POWER SAVE         = 30 MIN
KEEP TEMP. HIGH    = 15.0 MIN
ALARM BELL         = ON
LANGUAGE           = ENGLISH
MENU ACCESS        = ALL
HOST CHANNEL       = I/O EXTENSION
TRACTOR POOL       = OFF
RECALL FACTORY     = NO
RESET DEVELOP. INFO= NO
RESET OPC INFO     = NO
RESET FUSER INFO   = NO

CLOCK MENU
WEEKDAY            = MONDAY
DAY                = 4
MONTH              = OCTOBER
YEAR               = 2000
HOUR               = 1
MINUTE             = 55
SECOND             = 4

INFO MENU
PRINTER TYPE       = 50
ENGINE ID          = 56R1 (2.002;2.001)
FIRMWARE VERSION   = 208 12615 4.27
STACKER VERSION    = 4.08 0.00
PANEL VERSION      = 0.26
DEVELOPER INFO     = 18% USED
OPC INFO           = 38% USED
FUSER INFO         = 11% USED

```

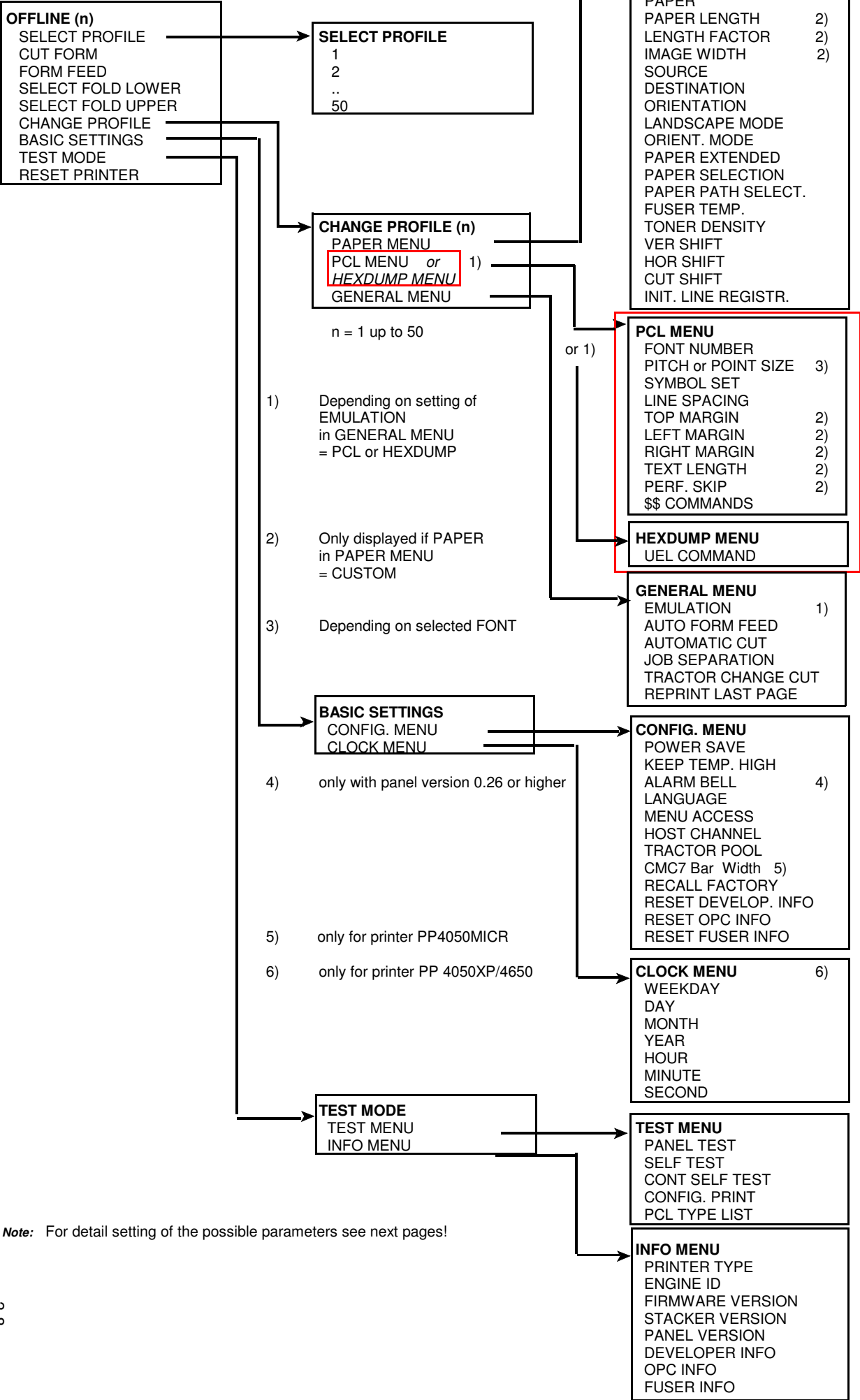
*) Depending on setting of **EMULATION** in the **GENERAL MENU** (see **TEST PRINT**) either **PCL MENU** or **HEXDUMP MENU** is indicated.

**) This value is depending on selected FONT NUMBER;
for FONT NUMBER 0, 39 - 44 = PITCH and
for FONT NUMBER 1 - 38 = POINT SIZE

See Paragraph **3.4 Menu Structure** for the different entry points and Chapter **4 Explanation of individual Menu Items** !

3.4 Menu Structure

n = 1 up to 10 (PP 4050); 1 up to 50 (PP4050XP)



Note: For detail setting of the possible parameters see next pages!

3.5 Menu Item Description

OFFLINE

PARAMETER	VALUE
SELECT PROFILE	see below
CUT FORM	
FORM FEED	
FEED MULTIPLE PAGES	1.....16
SELECT FOLD LOWER	POSITIVE |> * NEGATIVE |<
SELECT FOLD UPPER	POSITIVE |> * NEGATIVE |<
CHANGE PROFILE	see below
BASIC SETTINGS	see below
TEST MODE	see below
RESET PRINTER	NO * YES

The following table show menu modes, submenus and parameters.
Precondition is: Access to all menu items is allowed. (MENU ACCESS = ALL) Otherwise restrictions are to observed.

SELECT PROFILE

Entry Point = **SELECT PROFILE**

PARAMETER	VALUE
SELECT PROFILE	1 * 2 10 (PP4050 max. 10; PP4050XP/4650 max. 50)

Note: A asterisk (*) after the value indicates the actual setting!

PAPER MENU

Entry Point = **CHANGE PROFILE (n = 1 - 10) ---> PAPER MENU**

Paper Menu	Value / Parameter
PAPER	CUSTOM * LETTER A4
PAPER LENGTH (Only for CUSTOM)	12 INCH * (Range: 3...20 inch; in steps of 1/4 or 1/6 inch)
LENGTH FACTOR (Only for CUSTOM)	1 * (Range: 1 - 20 logical pages)
IMAGE WIDTH (Only for CUSTOM)	16 INCH * (Range: 0,5...16 inch; in steps of 0.05 inch)
SOURCE	LOWER * UPPER
DESTINATION	BOTTOM * TOP (Always with cutting) BOTTOM CUT
ORIENTATION	PORTRAIT * LANDSCAPE
LANDSCAPE MODE	REVERSE * PCL COMPATIBLE
ORIENT. MODE	FIXED * AUTOMATIC
PAPER EXTENDED	NO * YES
PAPER SELECTION	ONLY P/JL * RECOGNIZE IGNORE
PAPER PATH SELECT.	RECOGNIZE * IGNORE
FUSER TEMP.	MIDDLE * HIGH LOW

Paper Menu	Value / Parameter
TONER DENSITY	LOW MIDDLE * HIGH ECO-TOP MICR LOW MICR MIDDLE MICR HIGH Note: MICR is only available in PP 4050 MICR printer.
VER SHIFT	0/100 INCH * (Range: -50/100 up to +50/100 inch)
HOR SHIFT	0/100 INCH * (Range: -50/100 up to +50/100 inch)
CUT SHIFT	0/100 INCH * (Range: -50/100 up to +50/100 inch)
INIT LINE REGISTR.	1 * (Choice: 1 up to 6 patterns) 1 = No correction 2 = Displacement on the first 2 pages by 0,5 mm 3 = Displacement on the first 2 pages by 1,0 mm 4 = Displacement on the first 2 pages by 1,5 mm 5 = Displacement on the first 5 pages up to 0,5 mm 6 = Displacement on the first 5 pages up to 1,0 mm

PCL MENU

Entry Point = **CHANGE PROFILE** ---> **PCL MENU**

Note: The **PCL MENU** will be displayed if the **EMULATION** in the **GENERAL MENU** is set to **PCL**

PCL Menu	Value / Parameter
FONT NUMBER	0 * (Range: Font No. 0 up to 54)
PITCH	10.00 * (For Font No. 0, 39...44 are values 0.44...99.99 CPI possible)
POINT SIZE	12.00 * (For Font No. 1...38 are values 4.00...999.75 in steps of 0.25 PT) (Font No. 45...54 are not scalable)
SYMBOL SET	ROMAN-8 * ISO L1 (31 symbol sets are selectable)
LINE SPACING	6 LINES/ INCH * (Range: 1,2,3...48 LPI)
TOP MARGIN	0 LINES * (Range: 0 - 999 lines)
LEFT MARGIN	0 COLUMNS * (Range: 0 - 999 columns)
RIGHT MARGIN	MAXIMUM * (Range: 0 - 999 columns and Maximum)
TEXT LENGTH	72 LINES * (Range: 0 - 999 lines)
PERF. SKIP	OFF * ON
\$\$ COMMANDS	OFF ON

HEXDUMP MENU

Entry Point = **CHANGE PROFILE ---> HEXDUMP MENU**

Note: The **HEXDUMP MENU** will be displayed if the **EMULATION** in the **GENERAL MENU** is set to **HEXDUMP**

Hexdump Menu	Value / Parameter
UEL COMMAND	RECOGNIZE * IGNORE

GENERAL MENU

Entry Point = **CHANGE PROFILE ---> GENERAL MENU**

General Menu	Value / Parameter
EMULATION	PCL * HEXDUMP
AUTO FORM FEED	OFF * (Range: OFF or 1 - 120 sec.)
AUTOMATIC CUT	OFF * (Range: OFF or 1 - 120 sec.)
JOB SEPARATION	OFF * ON
TRACTOR CHANGE CUT	ON * OFF
REPRINT LAST PAGE	OFF * ON

CONFIG MENUEntry Point = **BASIC SETTING ----> CONFIG MENU**

Config Menu	Value / Parameter
POWER SAVE	15 MIN * (Range: 15 up to 60 minutes; in steps of 15 min.) OFF
KEEP TEMP. HIGH	1.0 MIN * (Range 0.5 up to 60 minutes; step 0.5 min.) ALWAYS
ALARM BELL	ON * OFF
LANGUAGE	ENGLISH * DEUTSCH FRANCAIS ESPANOL
MENU ACCESS	ALL * PROFILES ONLY NONE
HOST CHANNEL	PARALLEL ONLY * I/O EXTENSION
TRACTOR POOL	ON * OFF
RECALL FACTORY	NO * YES (Execution time of the reset may lost up to 2 minutes)
RESET DEVELOPER	NO * YES
RESET OPC	NO * YES
RESET FUSER	NO * YES

CLOCK MENU

(only for printers PP 4050XP/PP 4650)

Entry Point = **BASIC SETTINGS —> CLOCK MENU**

Clock Menu	Value / Parameter
WEEKDAY	Monday up to Sunday
DAY	1.....31
MONTH	January up to December
YEAR	2000 ...
HOUR	0 .. 24
MINUTE	0 .. 59
SECOND	0 .. 59

TEST MENUEntry Point = **TEST MODE ----> TEST MENU**

Test Menu	Function / Action
PANEL TEST	Check up of the Operator Panel display
SELF TEST	Printout of the actual settings
CONT SELF TEST	More pages with the actual settings
CONFIG. TEST	Printout of all Profiles
PCL TYPE LIST	Print out of the resident Typeface List

INFO MENU

Entry Point = **TEST MODE ---> INFO MENU**

Info Menu	Function / Action
Printer TYPE	* (depending on printer model)
ENGINE ID	Print out of the actual Engine Firmware revision
FIRMWARE VERSION	Print out of the actual PPOS revision
STACKER VERSION	Print out of the actual Stacker Firmware
PANEL VERSION	Print out of the actual Operator Panel Firmware revision
DEVELOPER INFO	Usage grade in % of the total life cycle of the Developer
OPC INFO	Usage grade in % of the total life cycle of the OPC
FUSER INFO	Usage grade in % of the total life cycle of the Fuser

* 50 or 50/300 or 50/600

3.6 Configuration Programs

For printer configuration a program **Profiler** is available. By means of this program , all profiles can be retrieved, edited and thereafter transmitted back to the printer.

For setting up the network interface a tool

InterCon NetTool

is available.


You will find both programs under

www.psi-laser.de/tools.php?lang=en.

4 Explanation of Individual Menu Items

In **OFFLINE** mode


- the different PROFILES can be programmed,
- the BASIC SETTINGS can be configured,
- and the printer can be set into the TEST MODE.

Note: All following functions are in the **OFFLINE** mode selectable by turning the quick set up wheel  (see also chapter **2.1.3 Function Keys**).


– SELECT PROFILE

To activate one out of **10** (PP 4050) or **50** (PP4050XP) possible set up parameter blocks called **Profiles**, for quickly changing the application specific printer set up.




– CUT FORM

By pressing  the cut function will be activated. The paper is moving depending on the selected paper length to the cut position. After cutting it moves backwards to the print position.

– FORM FEED

After pressing  the last printed page will move depending on the selected paper length to the tear off position.

After loading a new batch of paper it is also possible to insert empty pages into a print job.

By pressing  one empty page is inserted. If you need more empty pages wait until the movement of the form is finished and press  again. To start or continue the print job press .

Explanation of Individual Menu Items

– SELECT FOLD LOWER

– SELECT FOLD UPPER

The standard setting for both tractors is **POSITIVE** fold. In this case check that the fold behind the first page is a positive one (fold points outwards). If not tear off one page and insert the paper again beginning with a positive fold.

If it is not possible to lose a page use this parameter to change the standard setting to **NEGATIVE**.

– CHANGE PROFILE

To change one out of 10 or 50 possible set up parameter blocks called **Profiles**, determining the application specific printer set up.

Note: Each profile contains all print job relevant set up parameters specifying the features and functions grouped into different submenus like PAPER MENU, PCL MENU, and GENERAL MENU. For details see chapter 4.2.

– BASIC SETTINGS

In this menu mode it is possible to configure all the basic operation related features of the Printer (e.g. **Power Save**, **Keep Temperature High**, or **Menu Access**).

– TEST MODE

This function initiates a printout of the parameter settings, Profile definitions, and PCL typeface list. This printout is helpful for future reference and in case a Profile need to be changed.

– RESET PRINTER

If it is necessary to cancel a print job and reset the printer use this function by setting the value to **YES**. After resetting the printer changes automatically to **NO**.

Note: Before starting this function, cancel the print job on the host system!

4.1 Menu Mode **SELECT PROFILE**

Activation of one out of 10 Profiles

4.2 Menu Mode **CHANGE PROFILE**

Configuration of one specific Profile.

4.2.1 Submenu **PAPER MENU**

– **PAPER**

A choice out of three different paper sizes can be made:

A4

LETTER

CUSTOM.

If **A4** or **LETTER** is selected the printer automatically sets all parameters which define the allocation of the print image on a page. Those parameter values are in accordance to the PCL5 definition.

In case of **A4** the contents of an A4 page is printed asymmetrically onto a 12 inch form which leads to a larger bottom margin than top margin.

In case of **LETTER** the page contents are printed onto an 11 inch form.

Note: If the paper size is changed from one format into another the printer selects the default values of the format describing parameters (PAPER LENGTH, IMAGE WIDTH etc.) which belong to the chosen paper size.

Paper size (PAPER) can be selected at the control panel or by means of PCL- or PJL-commands from the host system (see also **PAPER SELECTION**).

– **PAPER LENGTH** ¹⁾

The paper length (physical paper length) can be selected in the range from 3 inch (76.2 mm) up to 24 inch (609.6 mm) in steps of $\frac{1}{6}$ (4.23 mm) or $\frac{1}{4}$ inch (6.35 mm):

3; $3\frac{1}{6}$; $3\frac{1}{4}$; $3\frac{1}{3}$; $3\frac{1}{2}$
 $3\frac{3}{4}$; $3\frac{5}{6}$; 4; **12**;24

Note: If ORIENTATION = LANDSCAPE is selected the paper length now corresponds to the page width.

Note for PP 4050: In case of forms with paper length > 13.5 inch (345.45 mm) the data buffer of 16 MB might not be sufficient to ensure a continuous printing. In those applications an additional memory module of minimum 16 MB must be inserted.

– **LENGTH FACTOR** ¹⁾

The length factor divides the physical paper length into an integer multiple of logical pages.

A physical page is printed when its pertaining last logical page is completed with a Form Feed command. If the number of logical pages isn't a multiple of the **LENGTH FACTOR**, the contents of the residual logical pages will remain in the printer. The functions **CUT FORM** or **FORM FEED** in the **OFFLINE MENU** and the functions **AUTO FORM FEED** or **AUTOMATIC CUT** in the **GENERAL MENU** cause the printer to print the residual logical pages and to feed the paper in the raster of a physical page.

Example: The **PAPER LENGTH** is **12 inch** and the **LENGTH FACTOR** is **3**. That means the application prints three logical pages of 4 inch each on one physical page.

The range is 1 up to 20 logical pages per physical page.

¹⁾ This menu item is only displayed if PAPER size **CUSTOM** is selected.

– IMAGE WIDTH ¹⁾

The print image is always centered on a page - not at the left or right margin.
The width of the print image can be selected from min. 0.5 inch (12.7 mm)
up to max. 16.00 (406.5 mm) in steps of 0.05 inch (1.27 mm):

0.50; 0.55; 0.60; 0.65;**16.00**;

Note: If ORIENTATION = LANDSCAPE is selected the image width now corresponds to the page height.

– SOURCE

The printer offers two choices for fanfold paper input:

- **LOWER** (default)
- **UPPER**

Note: Please refer to chapter **7 Technical Data** for media specifications.

– DESTINATION

It is possible to choose between **BOTTOM**, **BOTTOM CUT** (to leave the printer at the paper exit on the right side) and **TOP** (at the top on the right side).

If **BOTTOM** (default) is selected fanfold paper leaves the printer at the paper exit (right side). The cutter is not activated by default. If print jobs shall be separated the cutter must be activated via ESC sequences from the host system.

BOTTOM CUT means that page by page will be cut.

If **TOP** is selected the fanfold paper automatically leaves the printer as cut sheets which are collected face down on top of the printer. The position where the paper is cut is determined by the parameter Paper Length.

Note: If, for some reason, it is not desired to cut exactly on the perforation it is very important to **cut below the perforation**.

If the paper is cut above the perforation the remaining paper can easily bend and cause a paper jam. Do not cut through a label as the blade would get dirty by the glue. See also **CUT SHIFT** to adjust the cut position.

¹⁾ This menu item is only displayed if PAPER size **CUSTOM** is selected.

– ORIENTATION

The orientation of the print image may either be **PORTRAIT** or **LANDSCAPE**. The physical orientation of the print image is also influenced by the setting of **LANDSCAPE MODE** and **ORIENTATION MODE**.

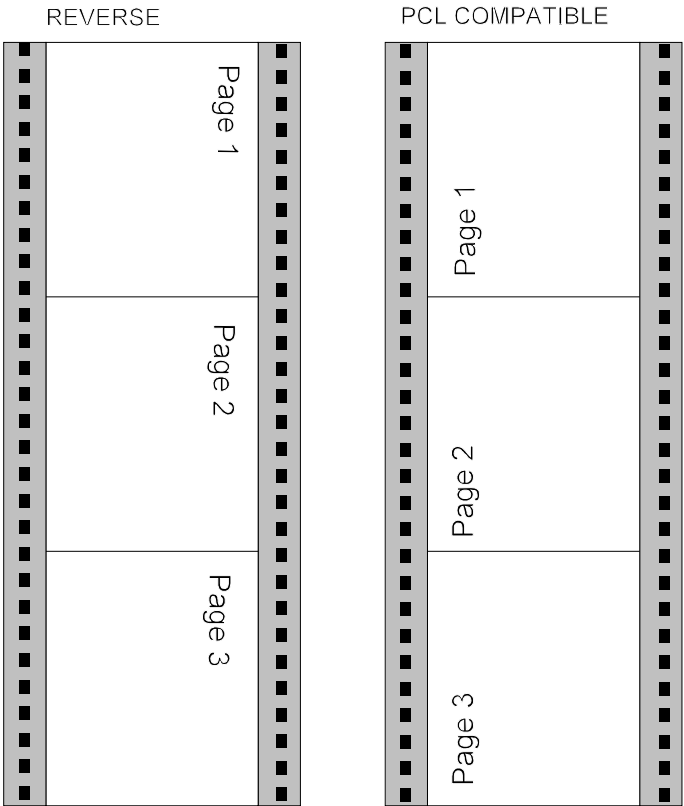
Note: If the orientation is changed from one direction into the other the page describing parameters (MARGINS, IMAGE WIDTH, VER SHIFT, HOR SHIFT etc.) are set to the corresponding default values. The physical page length will not be changed.

If printing is performed in **LANDSCAPE** and the selected values for image width and line spacing don't lead to an integer multiple of lines within this image area the result will be a displacement in the print image between two contiguous pages. An evenly arranged print image can only be achieved by either adapting the image width to the line spacing or by selection of **PERF.SKIP = ON**.

– **LANDSCAPE MODE**

The orientation of the print image is influenced by this parameter. Setting Landscape Mode to **REVERSE** (default) rotates the image of LANDSCAPE to REVERSE LANDSCAPE and REVERSE LANDSCAPE to LANDSCAPE. This makes continuous pages with landscape orientation readable like a book. Selection of **PCL COMPATIBLE** is according to the landscape definition of PCL i.e. rotation by 180° counter clockwise.

Print sample for **LANDSCAPE MODE** if
ORIENTATION = LANDSCAPE and **ORIENT. MODE = FIXED** selected:

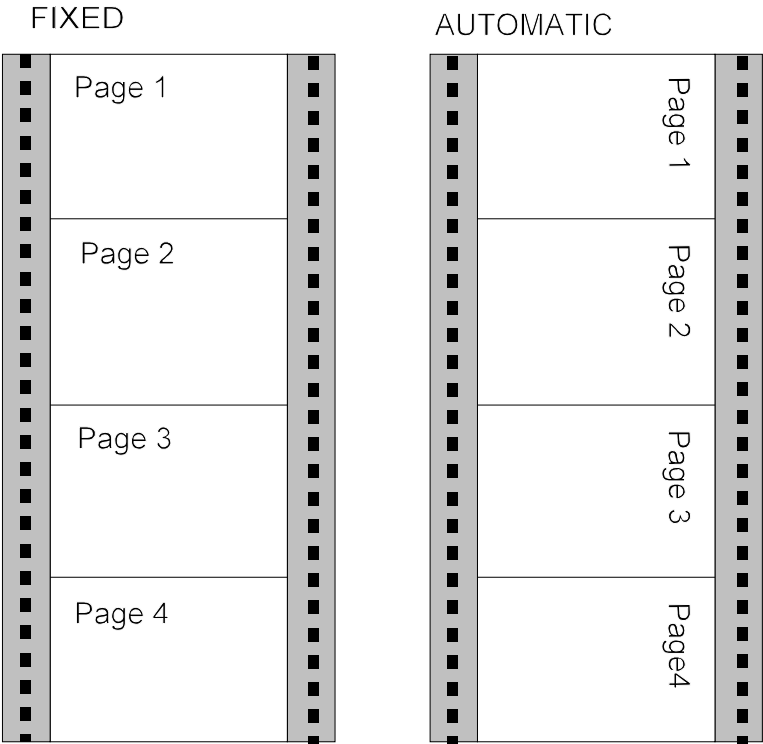


– **ORIENT. MODE** (Orientation Mode)

The Orientation Mode defines the print image rotation for CUSTOM paper format. Setting the Orientation Mode to **FIXED** (default) ensures that the print orientation of a form with paper length shorter than the image width is not rotated.

Setting the Orientation Mode to **AUTOMATIC** rotates the print image if the form length is shorter than the image width. This selection is required for applications which make use of the PCL compatible automatic rotation.

Print sample for **ORIENTATION MODE** if
ORIENTATION = PORTRAIT and **LANDSCAPE MODE = RESERVE**
selected:



– PAPER EXTENDED

With **PAPER EXTENDED** set to **NO** printing into the border areas of **A4** and **LETTER** pages is not possible which is in line with the PCL5 definition. However, for compatibility to existing applications which use the border areas **PAPER EXTENDED** can be set to **YES**. Now the entire physical page is printable at which the default cursor position remains unchanged. With format **CUSTOM** the complete page can also be printed but the default cursor position is always the first dot at the upper left corner.

– PAPER SELECTION

Selecting the paper format (A4, LETTER, CUSTOM) from the host can be done with PCL or PJL commands. The execution of this commands can be influenced by the parameter **PAPER SELECTION**.

- | | |
|------------------|---|
| RECOGNIZE | - A change of PAPER is possible via interface by means of PCL- or PJL-commands. |
| ONLY PJL | - Only via PJL-command (default) |
| IGNORE | - Any command to change the paper format will be ignored; the paper format can only be modified via the operator panel. |

Note: **PAPER SELECTION** by the printer driver needs the setting **RECOGNIZE** or **ONLY PJL**.

The PSi printer driver for Windows® uses PCL and PJL sequences.

– PAPER PATH SELECT. (Paper Path Selection)

With this parameter it is possible to recognize or ignore the change of the parameter **SOURCE** and **DESTINATION** via the interface. Factory default is **RECOGNIZE**.

- | | |
|------------------|--|
| RECOGNIZE | - A change of the parameters SOURCE and/or DESTINATION is possible via interface by means of PCL- or PJL-commands. (See Appendix A Paper Source and Exit Selection). |
| IGNORE | - Any command to change the parameter will be ignored. |

Note: **PAPER PATH SELECTION** by the printer driver needs the setting **RECOGNIZE**.

– FUSER TEMP. (Fuser Temperatur)

This parameter allows to adapt the fuser temperature to media properties. Default level is **MIDDLE** (about 180° C) .

Other selections are:

- **HIGH** (for thick paper, labels, and in conjunction with MICR; about 190° C)
- **LOW** (for thin paper; about 160° C)

Fuser temperature adjustment is necessary when temperature sensitive formsets (e.g. labels) are printed.

– TONER DENSITY

This parameter allows to adjust the toner density.

For all printers:

for MICR Printer:

- | | |
|-----------------------------------|----------------------|
| - LOW | - MICR LOW |
| - MIDDLE (default) | - MICR MIDDLE |
| - HIGH | - MICR HIGH |
| - ECO-TOP (not in PP 4650) | |

Note: The density will not be changed immediately but after having printed about 70 to 100 pages.

ECO-TOP is a toner save mode e.g. to print listings.

– VER SHIFT (VERTICAL SHIFT)

– HOR SHIFT (HORIZONTAL SHIFT)

The parameters **VER SHIFT** and **HOR SHIFT** allow to precisely position the print image vertically (-50...+200/100) and horizontally (-50...+50/100). The adjustment can be done in steps of 1/100 inch (0.25 mm); factory default value of both parameters is zero.

– CUT SHIFT (Vertical Positioning for Cutting Device)

This parameter is meant to shift the cut position.

The parameter covers a range of -50...+50/100 of an inch, where "-" is up the page and "+" is further down the page. The default value is zero.

Note: If it is not required to cut exactly through the perforation then the paper should be cut about 0.5 mm **below the perforation**. If the paper is cut above the perforation the remaining paper can be easily bent and cause a paper jam. **Do not cut through a label as the blade would get dirty by the glue.**

– **INIT. LINE REGISTR.** (Initial Line Registration)

The conditions inside the printer for feeding of the first pages of a fanfold paper starting from paper load or paper parking position for paper transportation is different during continuous printing. If not compensated, it may lead to an extension of the total line registration tolerance. The function shall be used to compensate this effect and precisely position the print out even at the very beginning of a print job.

There are five patterns available.

Effects of the patterns:

A correction by means of pattern 2 to 6 shifts the print image to the bottom (in direction of the middle of the paper).

Pattern 1:	No correction
Pattern 2:	Displacement on the first 2 pages by 0,5 mm
Pattern 3:	Displacement on the first 2 pages by 1,0 mm
Pattern 4:	Displacement on the first 2 pages by 1,5 mm
Pattern 5:	Displacement on the first 5 pages up to 0,5 mm
Pattern 6:	Displacement on the first 5 pages up to 1,0 mm

The compensation values apply to a paper length of 11 inch. For page length different to 11 inch the printer automatically adapts the values accordingly.

Typically, pattern 3 has the best correction result for standard paper of a weight of 70 - 90 g/m² and a paper width of 9 up to 17 inch. If ever required pattern 5 or 6 should be applied for thick paper of 120 g/ m² and above.

How to find the best adjustment:

Step 1 Use the parameter **VER SHIFT** to properly align the line registration for the 10th and all following pages.

Step 2 Select one of the patterns above for proper alignment of the line. registration for the first 2 or 5 pages.

4.2.2 PCL MENU

Definition of the parameters for character presentation on a page.

Note: The PCL MENU will only be displayed if EMULATION = PCL is selected in the GENERAL MENU.

– **FONT NUMBER**

The font number selects one of the 55 PCL typefaces (for PP 4050 MICR 57) as the default font within the PCL emulation. A printout of the PCL TYPE LIST can be started within the TEST MENU. Default is font no. 0 (COURIER)

– **PITCH**

Pitch defines the character size for FONT NUMBER 0 and 39 to 44. Any value from 0.44 to 99.99 CPI can be selected. Default value is 10.00 characters per inch.

– **POINT SIZE**

For FONT NUMBER 1 to 38 character scaling is defined as point size. Values can be selected from 4.00 to 999.75 PT in steps of 0.25. Default value is 12.00 PT.

Note: FONT NUMBER 45 to 54 (for PP 4050 MICR 45 to 56) are not scalable, neither the menu item PITCH nor POINT SIZE is applicable.

– SYMBOL SET

Symbol Set means a code table of characters and symbols.

Factory default is the ROMAN-8 symbol set. One of the following 36 different Sets (plus 2 MICR sets in PP 4050 MICR) can be chosen being the standard set in PCL.

Display	Symbol Set	ID number
ROMAN-8	Roman-8	8U
ISO L1	ISO 8859/1 Latin 1	0N
ISO L2	ISO 8859/2 Latin 2	2N
ISO L5	ISO 8859/9 Latin 5	5N
ISO L9	ISO 8859/15 Latin 9	9N
PC-8	PC-8 Code Page 437	10U
PC-8 DN	PC-8 Danish/Norwegian	11U
PC-850	PC-850 Multilingual	12U
PC-852	PC-852 Latin 2	17U
PC-858	PC-858 Multilingual	13U
PC-8 TK	PC-Turkish	9T
WIN L1	Windows 3.1 Latin 1	19U
WIN L2	Windows 3.1 Latin 2	9E
WIN L5	Windows 3.1 Latin 5	5T
DESKTOP	Desktop	7J
PS TEXT	PS text	10J
VN INTL	Ventura International	13J
VN US	Ventura US	14J
MS PUBL	Microsoft Publishing	6J
MATH-8	Math-8	8M
PS MATH		PS Math5M
VN MATH	Ventura Math	6M
PI FONT	Pi Font	15U
LEGAL	Legal	1U
ISO-4	ISO United Kingdom	1E
ISO-6	ISO US ASCII	0U
ISO-11	ISO Swedish	0S
ISO-15	ISO Italian	0I
ISO-17	ISO Spanish	2S
ISO-21	ISO German	1G
ISO-60	ISO Norwegian	0D
ISO-69	ISO French	1F
WIN 3.0	Windows 3.0 Latin 1	9U
WIN BALTIC	Windows 3.0 Baltic	19L
none	Symbol	19M
none	Windings	579L
none	MICR-CMC7 (only MICR printer)	14Y
none	MICR-E13B (only MICR printer)	10O

– LINE SPACING

The distance between print lines is determined in lines/inch; selectable values are: 1,2,3... 48 lines/inch. Default is 6 lines/inch.

– TOP MARGIN ¹⁾

This parameter defines the number of lines between the top edge of the page and the first print line. Any value from 0 up to 999 lines can be chosen; factory default value is 0.

– LEFT MARGIN ¹⁾

This parameter defines the displacement of the first print position of a print line from the left border of the printable area. Any value from 0 up to 999 positions can be selected; factory default value is 0.

– RIGHT MARGIN ¹⁾

The parameter value defines the distance of the last print position within a line from the left border of the logical page. Any value in the range from 0 up to 999 and **MAXIMUM** can be selected; factory default is MAXIMUM. Right Margin should only be set to a defined value if the application requires a text formatting by the printer.

Note: Setting **RIGHT MARGIN** in applications with download fonts or use landscape orientation may cause loss of characters in a line.

– TEXT LENGTH ¹⁾

The parameter defines the number of lines on a page; exceeding this limit leads to a transition onto the next following page. Any value from 0 up to 999 can be selected; factory default value is 72. The parameter is ignored if **PERF. SKIP = OFF** was selected.

– PERF. SKIP (PERFORATION SKIP) ¹⁾

In case of **PERF. SKIP = ON** the printer takes the values of TOP MARGIN and TEXT LENGTH into account on each page.

If **PERF. SKIP = OFF** is selected the printer prints over the perforation. At the transition onto a next following page the values of TOP MARGIN and TEXT LENGTH are ignored. Factory default selection is OFF.

¹⁾ This menu item is only displayed if PAPER size **CUSTOM** is selected.

– \$\$ COMMANDS

This function causes \$\$ either to be printed as \$\$ or to program ESC commands within an application.

If this function is set to **ON** the characters are interpreted by the printer in the following way:

\$\$/ means **ESC** .

4.2.3 HEXDUMP MENU

The HEXDUMP MENU defines the execution of control sequences when the HEXDUMP mode has been activated.

Note: The HEXDUMP MENU will only be displayed if EMULATION in the GENERAL MENU is set to HEXDUMP.

– UEL COMMAND

Universal Exit Language commands can be set to **RECOGNIZE** or **IGNORE**. That means this code can be executed in HEXDUMP mode or the command is ignored and printed out as hex code. UEL commands are part of the Printer Job Language (PJL).

4.2.4 GENERAL MENU

Configuration of the basic operating parameters for a print job.

– EMULATION

The Emulation determines the printer's set of command codes.

Default emulation is PCL (PCL5E).

The function HEXDUMP is useful to analyze the data received by the printer. Control codes are not executed, instead all data including command codes are printed out in hexadecimal format and as ASCII characters. Any non-printable character, such as CR, is represented as a dot (.) in the ASCII list.

– AUTO FORM FEED

If the printdata does not fill a complete page or if there is no Form Feed command (HEX 0C) at the end of a page this page is not printed out. The page remains in the printer memory if this parameter is set to **OFF** and is printed when the page is fed manually. Such a not completed page is automatically printed out after a selectable time period at the end of a print job. (Break in datastream) The time period can be set from **1 to 120 second** (see also AUTOMATIC CUT). The time out will also be activated at the end of the print job.

– AUTOMATIC CUT

If the printdata does not fill a complete page or if there is no Form Feed command (HEX 0C) at the end of a page this page is not printed out. The page remains in the printer memory if this parameter is set to **OFF** and is printed when the page is fed manually. Such a not completed page is automatically printed out and cutted after a selectable time period at the end of a print job. (Break in datastream) The time period can be set from **1 to 120 second** (see also AUTO FORM FEED). The time out will also be activated at the end of the print job.

– JOB SEPARATION

Many application programs terminate a printjob with the PJI command **EOJ**. The firmware is supporting this command as well and allows to link the EOJ recognition to the set up parameter **JOB SEPARATION (ON / OFF)** in the **GENERAL MENU**.


If set to **ON** and the last page of a job is printed, a cut is performed, printing is stopped and the paper is removed into the parking position.

Factory default is **JOB SEPARATION = OFF**. This setting means that neither automatic feeding into the cut position, and no automatic cutting is performed. It is appropriate for batch output of continuous forms.

– TRACTOR CHANGE CUT

The automatic cut function after selecting a new **SOURCE** (e.g. from LOWER to UPPER) or a new **DESTINATION** (e.g. from BOTTOM to TOP) can be set to **OFF**. Factory default is **ON**.

ON - The automatic cut function is active.

OFF - After a change of **SOURCE** or **DESTINATION** the printer switches into the **OFFLINE** mode and the display shows the message **11 REMOVE PAPER**. Press  to enter the menu mode and activate **CUT FORM**. The paper will be cutted and move backwards to parkposition.

– REPRINT LAST PAGE

Dependent on the defined paper length the very last page(s) of a pile of fanfold paper may be printed weak.

The function **REPRINT LAST PAGE (ON/OFF)** in **GENERAL MENU** allows a reprinting or it surpresses the recovery of the last pages. Factory default is **REPRINT LAST PAGE = OFF**.

After inserting a new form the printer automatically recovers the misprinted pages if the function **REPRINT LAST PAGE** is **ON**

Paper length	Recovery of
≥ 10 inch	1 page
5 inch up to 9 ⁵ / ₆ inch	2 pages
3 ¹ / ₃ inch up to 4 ⁵ / ₆ inch	3 pages
3 inch up to 3 ¹ / ₄ inch	4 pages

4.3 Menu Mode BASIC SETTINGS

4.3.1 CONFIG MENU

In the Configuration Menu general settings for the printer's operation are defined.

– POWER SAVE

The time until the power save mode is entered can be set to **15, 30, 45, 60 MIN** or **OFF**; factory default is **15 MIN**.

- **OFF** The printer doesn't switch into the POWER SAVE mode.

In power save mode the printer switches off the fuser lamps, the fans, and motors. Power dissipation in POWER SAVE mode is **less than 45 watt**. The message **00 POWER SAVE** is displayed. A new print job causes the POWER SAVE mode to be left.

If there are no new messages to be displayed within the next **15 minutes** the panel light is switched off as well. This function is independent of the chosen POWER SAVE time.

– KEEP TEMP. HIGH (Keep Fuser Temperature High)

The fuser temperature will not be lowered if a break between print jobs is shorter than the selected time period; factory default is **1.0** minutes.

Possible values are:

ALWAYS, 0.5 up to **60** minutes in steps of **0.5** minutes.

Note: If paper is still in the fuser and a time period ≥ 3.5 minutes is selected the fuser temperature will be lowered after **three** minutes for safety reasons. This happens also in case **ALWAYS** has been selected.

– ALARM BELL

Any error that occurs during a print operation is reported by a corresponding error message on the display, additionally the buzzer in the operator panel electronics is activated and the panel LED flashes. The signals can be stopped by either pressing any key on the panel or by opening the cover. The default setting is **ON**. To disable this function set the value to **OFF**.

Note: The two short signals during power on are always active.

– LANGUAGE

Selects the language of the menu.




Default is **ENGLISH**; available are:

ENGLISH, FRANCAIS, and DEUTSCH (German)

– MENU ACCESS

The menu **CONFIG MENU** has been extended by the new function **MENU ACCESS**, defining the access rights to various submenus. The access rights could be defined being **ALL**, **PROFILE ONLY**, or **NONE**. The locked submenus aren't displayed on the panel. However, configuration changes by means of PJI commands are possible.

The access rights can be changed with the following combination of operator panel keys:

- Choose the new access right in **MENU ACCESS**.
- Choose the option and save it with the key [].
- Press **ESCAPE** [] within the next two seconds.
- Save with the key [] once more.

Note: A wrong key sequence results in cancelling the current trial and the complete sequence has to be started again.

– HOST CHANNEL

the following types are available:

- **PARALLEL ONLY** (Default)
- **I/O EXTENSION**

The selection **PARALLEL ONLY** means that only the Centronics port can receive data.

If **I/O EXTENSION** is selected only the optional channel can be used e.g. Ethernet.

– TRACTOR POOL

Paper is alternately inserted the lower and upper tractor i. e. the printer changes automatically from one tractor to the other in case of paper empty. The empty tractor cassette can be reloaded and thus will be ready for the next automatic change if needed. The pool function requires the same type of paper to be used in both tractor cassettes.

– CMC7 Bar Widths

The CMC7 specification defines the size of bars and gaps. A printer with 300dpi resolution can print a dot at positions in multiples of 85 micrometers which causes that for some CMC7 parameters a print position is close to the limits of the standard. Because toner density and media properties contribute to the registration it might be necessary to adapt the composition of a character to the application.

For that purpose an application specific parameter selection can be done in the printer's menu. The table below describes four selections and their resulting allocation of bars and gaps. Factory default setting is "1- 2 - 5".

ParameterSetting	Bar Width (mm)	Narrow Gap (mm)	Wide Gap (mm)	Gap between Characters (mm)
1 - 2 - 5	0.125	0.254	0.508	1.016
1 - 2 - 6	0.125	0.254	0.590	0.849
2 - 2 - 4	0.209	0.339	0.508	0.500
1 - 3 - 5	0.125	0.339	0.508	0.500

– RECALL FACTORY

By calling up **RECALL FACTORY** in **CONFIG. MENU** all menus, including all profiles are reset to the factory defaults. This function needs to be confirmed by the additional prompting YES/NO to prevent unintended reset of all parameters.

Note: The printer needs up to **two minutes** for reset !

- **RESET DEVELOPER INFO**
- **RESET OPC INFO**
- **RESET FUSER INFO**

In addition to the mechanical page counter the firmware has incorporated an individual software page counter which count the usage grade for each consumable. This information is calculated in percentage of the total lifecycle of the device and is displayed in the info menu and on the configuration test page. When the end of the lifetime is reached a value of 100% is indicated. After replacing the worn out consumable the user must reset the associated counter. The associated counter can be reset by **RESET DEVELOPER INFO**, **RESET OPC INFO**, or **RESET FUSER INFO**.

Important Note 1: The lifetime of a consumable is determined by the rotation and the movement of the mechanical parts. If a print is stopped the paper moves back into the parking position. This retracting is influencing the OPC life time and is registered in the lifecycle counting by three additional pages.

Important Note 2: After replacing the Developer Unit, the PC Cartridge, or the Fuser Unit the above mentioned Reset functions have to be called up.

4.3.2 **CLOCK MENU** (only PP 4050XP/PP4650)

Following settings are possible:

- **WEEKDAY**
- **DAY**
- **MONTH**
- **YEAR**
- **HOUR**
- **MINUTE**
- **SECOND**

4.4 **Menu Mode TEST MODE**

Within the TEST MODE general printer status informations can be accessed and test printouts can be generated.

The TEST MODE is split into:

- TEST MENU
- INFO MENU

4.4.1 **Submenu TEST MENU**


- **PANEL TEST**

Use this point to check all Operator Panel display functions.

- **SELF TEST**

This selection starts the printout of the test page with the actual configuration settings of the actual Profile and diagonal character test (see Paragraph 3.2.1 **How to Start the SELF TEST**)

- **CONT SELF TEST** (Continuous Selftest)

If this function is selected the printer continuously prints the test page (see SELF TEST) until the  key is pressed.

- **CONFIG. PRINT** (Configuration Print)

This selection starts a printout of all Profiles with the information about the PAPER MENU, PCL MENU, GENERAL MENU, and the CONFIG. MENU (see Paragraph 3.3 **Printout of all Profiles**)

– **PCL TYPEFACE LIST**

By activating the PCL TYPEFACE LIST a printout of all available PCL Typefaces is started including information about the scalability and corresponding font number.

Typeface	Pitch / Point	Font #
Courier SWC	scalable	I 0
Dutch801 SWC	scalable	I 1
Dutch801 SWC Bold	scalable	I 2
Dutch801 SWC Italic	scalable	I 3
Dutch801 SWC Bold Italic	scalable	I 4
ZapfHumst Dm SWC	scalable	I 5
ZapfHumst Dm SWC Bold	scalable	I 6
ZapfHumst Dm SWC Italic	scalable	I 7
ZapfHumst Dm SWC Bold Italic	scalable	I 8
Ribbon 132 SWC Italic	scalable	I 9
Clarendon SWCCondensed Bold	scalable	I 10
Swiss742 SWC	scalable	I 11
Swiss742 SWC Bold	scalable	I 12
Swiss742 SWC Italic	scalable	I 13
Swiss742 SWC Bold Italic	scalable	I 14
Swiss742 Cn SWC Condensed	scalable	I 15
Swiss742 Cn SWC Condensed Bold	scalable	I 16
Swiss742 Cn SWC Condensed Italic	scalable	I 17
Swiss742 Cn SWC CondensedBold Italic	scalable	I 18
Incised901 SWC	scalable	I 19
Incised901 SWC Bold	scalable	I 20
Incised901 SWC Italic	scalable	I 21
OrigGaramond SWC	scalable	I 22
OrigGaramond SWC Bold	scalable	I 23
OrigGaramond SWC Italic	scalable	I 24
OrigGaramond SWC Bold Italic	scalable	I 25
Audrey Two SWC	scalable	I 26
Flareserif82 1 SWC	scalable	I 27
Flareserif82 1 SWC Bold	scalable	I 28

continuation see next page

Typeface	Pitch / Point	Font #
Swiss SWM	scalable	I 29
Swiss SWM Bold	scalable	I 30
Swiss SWM Italic	scalable	I 31
Swiss SWM Bold Italic	scalable	I 32
Dutch SWM	scalable	I 33
Dutch SWM Bold	scalable	I 34
Dutch SWM Italic	scalable	I 35
Dutch SWM Bold Italic	scalable	I 36
Symbol Set SWA	scalable	I 37
MoreWingbats SWC	scalable	I 38
Courier SWC Bold	scalable	I 39
Courier SWC Italic	scalable	I 40
Courier SWC Bold Italic	scalable	I 41
Letter Gothic	scalable	I 42
Letter Gothic Bold	scalable	I 43
Letter Gothic Italic	scalable	I 44
Line Printer	16.67/8.50	I 45
Line Printer	16.67/8.50	I 46
Line Printer	16.67/8.50	I 47
Line Printer	16.67/8.50	I 48
Line Printer	16.67/8.50	I 49
Line Printer	16.67/8.50	I 50
OCR A	10.0/12.0	I 51
bar code 39	8.11/12.0	I 52
bar code 39	4.69/12.0	I 53
OCR B	10.0/12.0	I 54
MICR - E13B (only for PP 4050 MICR)	7.89/12.0	I 55
MICR - CMC7 (only for PP 4050 MICR)	8.11/12.0	I 56

4.4.2 INFO MENU

In this submenu the following printer details are displayed of the Operator Panel:

- **ENGINE ID**
The actual Engine Firmware version.
- **FIRMWARE VERSION**
The actual Printer Operating System (PPOS) version.
- **STACKER VERSION**
The actual Stacker Software version.
- **PANEL VERSION**
The actual Panel Software version.
- **DEVELOPER INFO**
The actual usage grade in % of the Developer of the total life time of the device.
- **OPC INFO**
The actual usage grade in % of the PC Cartridge (OPC) of the total life time of the device.
- **FUSER INFO**
The actual usage grade in % of the Fuser of the total life time of the device.

5 Maintenance

How to use this Section

Chapter 5.1 up to 5.4 inform how to install the consumables. The **user preventive maintenance** is described in chapter 5.5

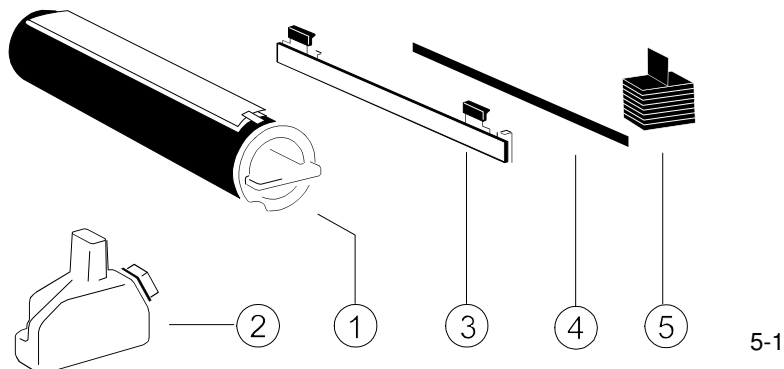
Note: For information about the lifetimes of the consumables see Chapter 7 **Technical Data**.

After replacing the consumables document the installation on the pages in **Chapter 9 Maintenance / Logbook**.

5.1 Installing the Parts of the Toner Kit

A Toner Kit comprises:

Standard Toner	MICR Toner (PP4050 only)
10 Toner Cartridges (1)	10 Toner Cartridges MICR (1)
5 Waste Toner Bottles (2); change it with every second Toner Cartridge	5 Waste Toner Bottles (2); change it with every second Toner Cartridge
1 Fuser Cleaner Platen (3)	1 Fuser Cleaner Platen (3)
5 Cleaner Felts (4); change it with every second Toner Cartridge	10 Cleaner Felts (4); change it with every Toner Cartridge
5 Ozone Filters (5), change it with every second Toner Cartridge	5 Ozone Filters (5), change it with every second Toner Cartridge




5.1.1 Refilling the Toner

By the message **14 TONER EMPTY** in the display the printer indicates that the toner cartridge has to be replaced by a new one.

Note: The message **16 TONER LOW** is only a warning that the printer will run out of toner soon; but don't replace the toner cartridge!

Only toner that has been released for the printer must be used. This toner is part of the before mentioned Toner Kit.

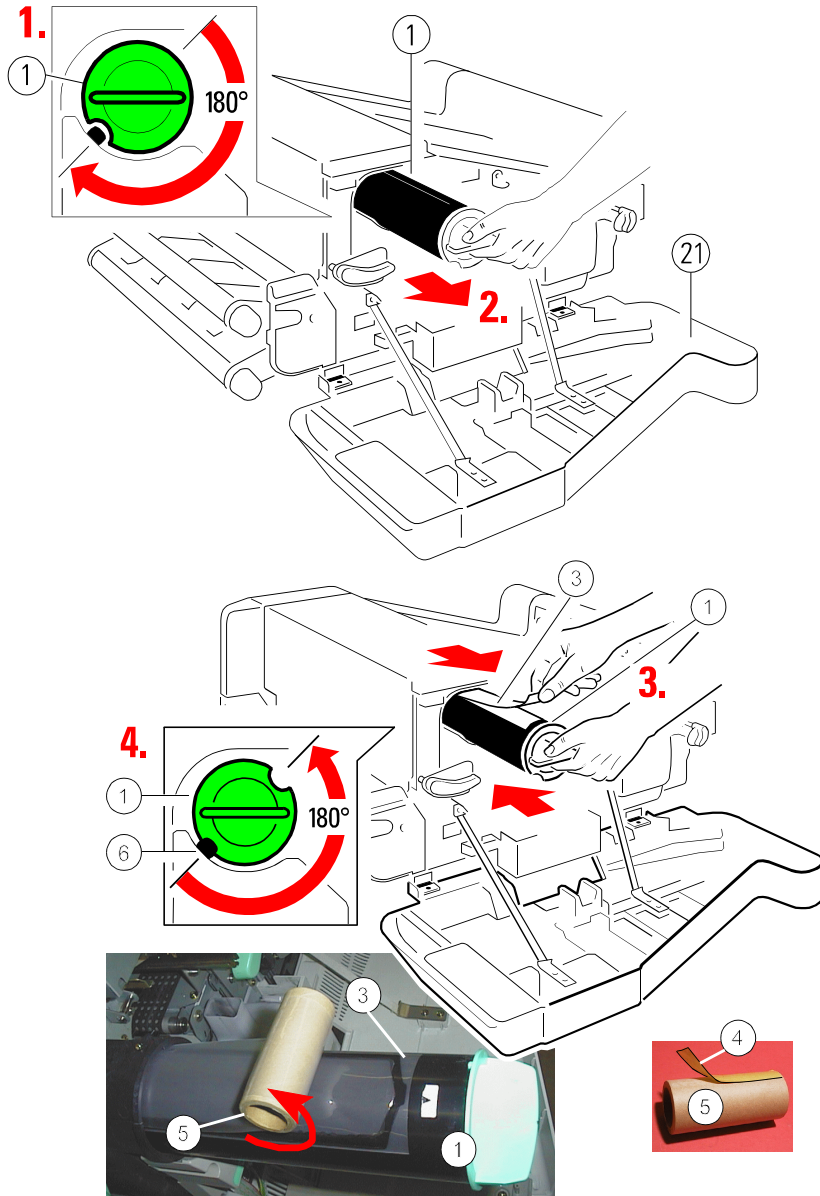
Note: Take care not to spill any toner inside the printer.

- Press first . **OFFLINE** will be displayed.
- Open the front cover (21) including the Control Panel.
- Turn the empty toner cartridge (1) clockwise by approximately 180 degrees until it is fully unlocked.
- Remove the toner cartridge.
- Shake the new toner cartridge several times.
- Insert a new toner cartridge approximate 10 cm, illustrated below, with the attached plastic seal (3) pointing to the top.
- Remove the stripe (4) from the cardboard roll (5) and fix it at the begin of the plastic seal tape (3).
- Turn the cardboard roll (5) to roll up the plastic seal (3) until the seal is entirely removed and push the toner cartridge until it is fully inserted.
- Turn the toner cartridge (1) counter clockwise by about 180 degrees until it is fully engaged.

Note: The cover of the toner cartridge (1) must be locked by the screw (6).


- Close the front cover (21).

Note: Don't refill the toner of the Waste Toner Bottle into the Toner Cartridge!

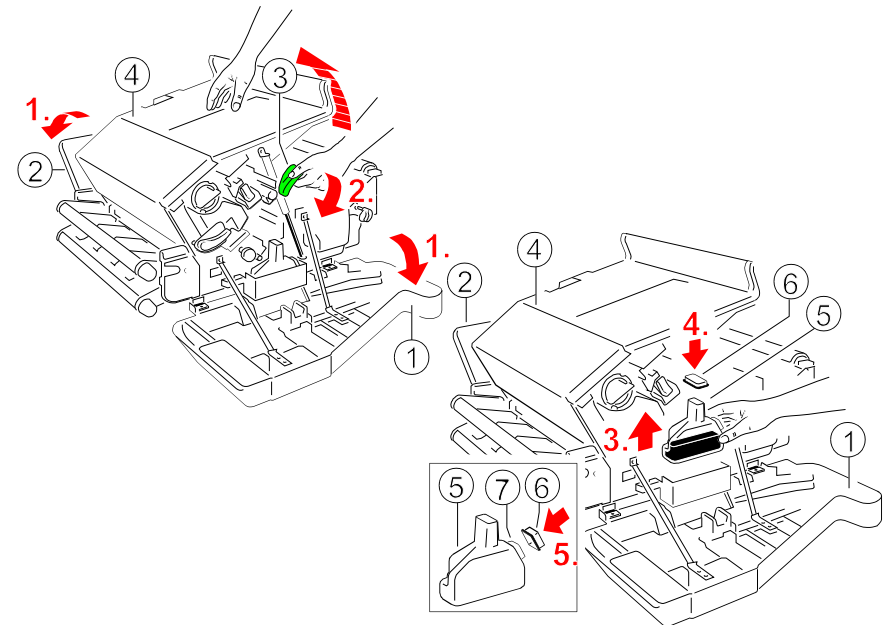


5.1.2 Replacing the Waste Toner Bottle

If the Waste Toner Bottle is already filled considerably this is indicated to the user by the message **15 CHECK TONER BOTTLE** on the display.

- Press first . **OFFLINE** will be displayed.
- Open the front (1) and rear (2) cover.
- Press the green lever (3) to open the top cover (4), illustrated below.
- Now remove the old Waste Toner Bottle (5) from its compartment. Close the filling hole with the cap (6). Take care that the cap fits tightly over the opening.
- Take an empty Waste Toner Bottle (5) and put it into the compartment. Please observe that the cap (6) is placed on the cap holder (7) and not over the filling hole.
- Close the top (4), rear (2) and front cover (1).


Note: Do not expose the light-sensitive OPC to room lighting or sunlight any longer than necessary. For this reason close the top cover (4) if you are finished.



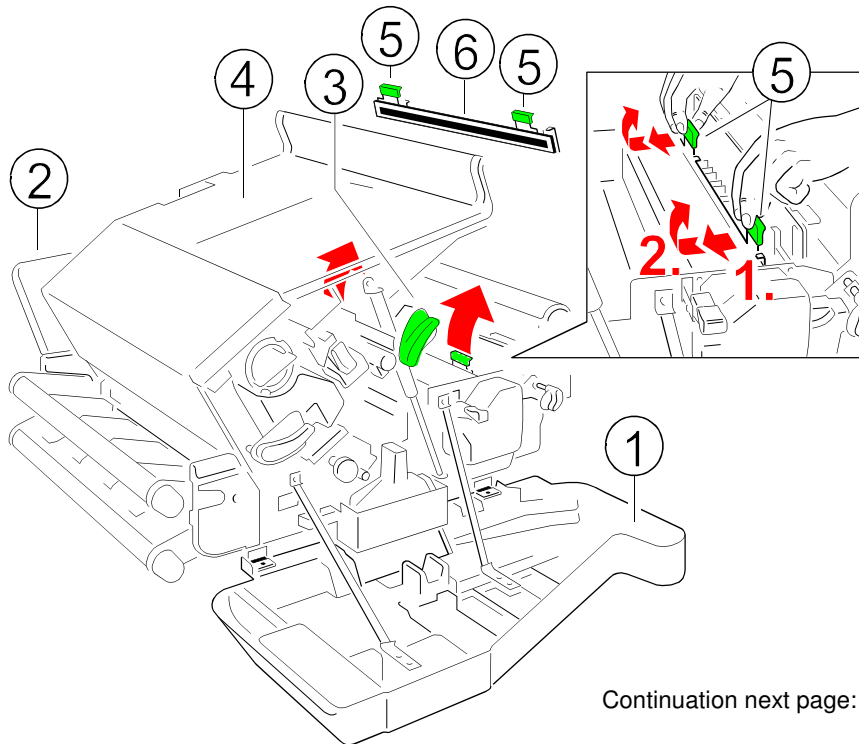
5.1.3 Changing the Cleaner Felt

If a new Toner Cartridge is inserted you should also check the status of the Cleaner Felt. The Cleaner Felt is below the top cover (4) and at the right side of the fuser unit.

If the Cleaner Felt is very dirty, it is advised to replace it. A new Cleaner Felt (6) is in the box of the Toner Kit.

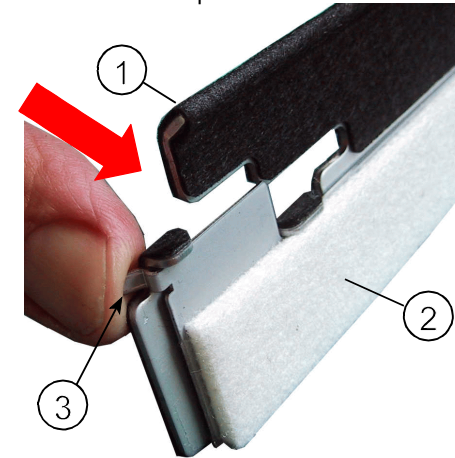
- Press first . **OFFLINE** will be displayed.
- Open the front (1) and rear (2) cover.
- Press the lever (3) to open the top cover (4), illustrated below.
- Now remove the Cleaner Felt (6) by pressing both green levers (5) in direction of the arrow and lift it, illustrated below.

Note: The metal bar of the Cleaner Felt might be very hot.
Don't throw away the Fuser Cleaner Platen!

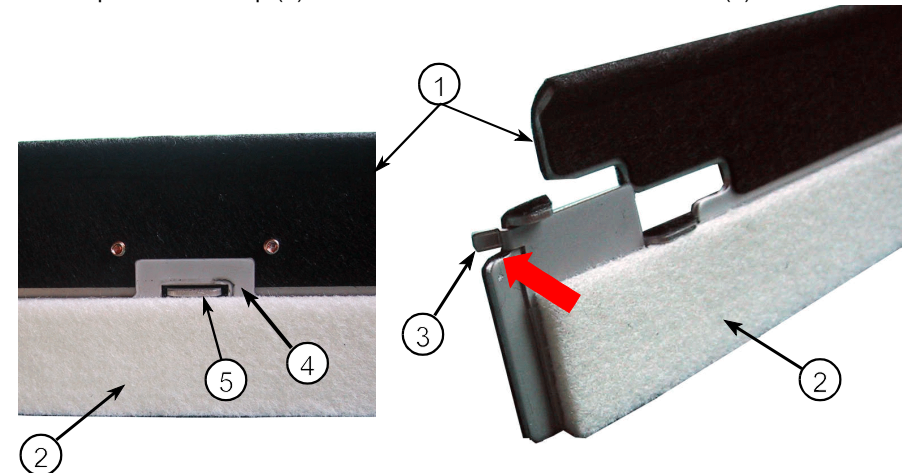


Continuation next page:

- Remove the Cleaner Felt (2) from the Cleaner Platen (1) by pressing the clamp (3) on both sides of the platen.



- Mount the new Cleaner Felt (2) with the eye in the middle (4) onto the lug (5) and press the clamp (3) on both sides onto the Cleaner Platen (1).




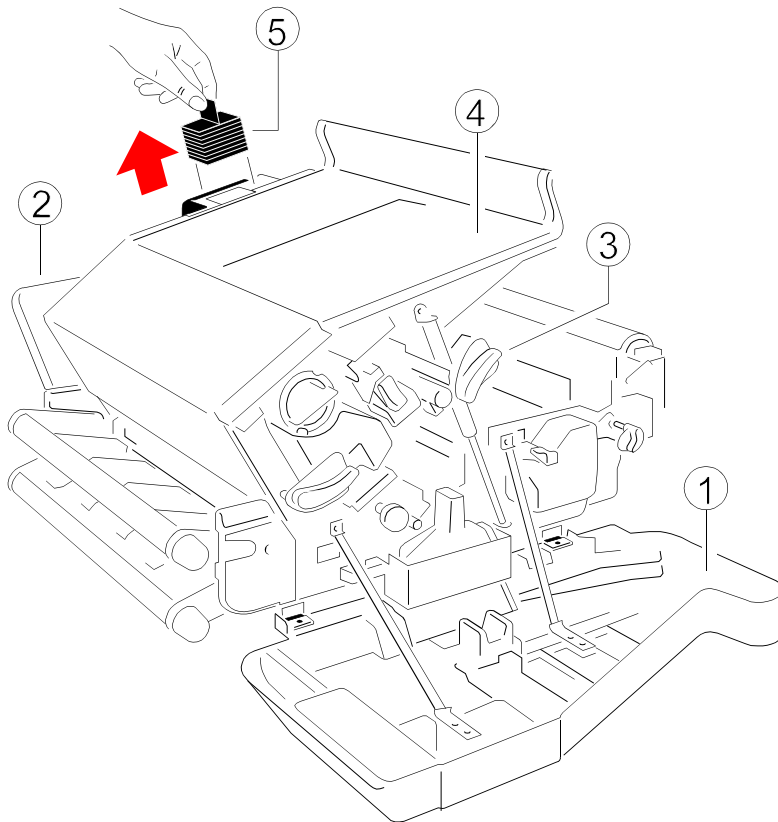
- Insert the new Cleaner Felt (2) including the Cleaner Platen (1).
- Close the top, rear and front cover.

Note: Depending on paper properties it might be necessary to change the Cleaner Felt more often!

5.1.4 Replacing the Ozone Filter

It is recommended to replace the Ozone Filter at regular intervals. The box of the Toner Kit also contains the Ozone Filter, a black cube (5).

- Press first . **OFFLINE** will be displayed.
- Open rear (2) cover.
- Remove the Ozone Filter (5) by using the small tab to hold the filter. Insert the new Ozone Filter (5) into the slot.
- Close the rear (2) cover.



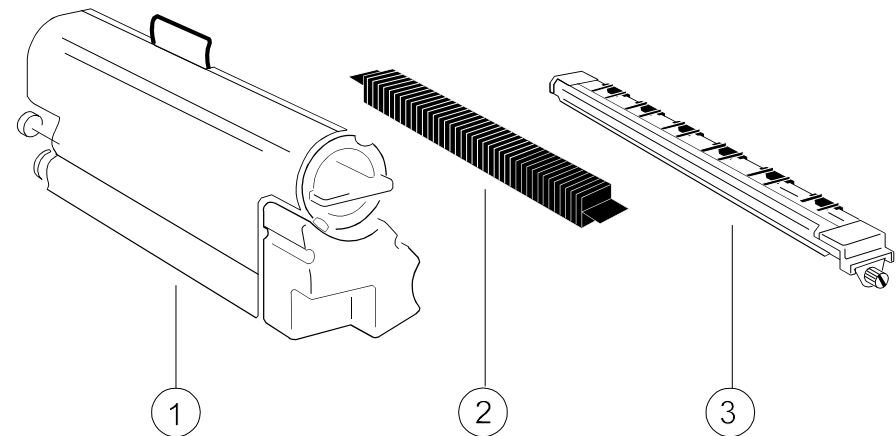
5.2 Installing the Parts of the Developer Kit

To guarantee a good print quality you have to replace the Developer Unit at regular intervals.


It is only allowed to use a Developer Unit which has been released for the printer.

The Developer Unit is part of the Developer Kit which consists of:

- the Ozone Filter (2) (like a long squared stone)
- the Developer Unit (1)
- the Transfer Charge Unit (3)



5.2.1 Replacing the Developer Unit

- Press first . **OFFLINE** will be displayed.
- Open the front (4) cover.
- Press the green lever (9) to the top to unlock the Developer Unit.
- Pull the Developer Unit (1) about $\frac{2}{3}$ out of the housing and grasp the grip (5) with one hand and pull it toward you.
- Remove the plastic bag from the clutch on the rear side.
- Remove plastic and paper safety strips (6) from the area of the toner output of the Developer Unit (1).

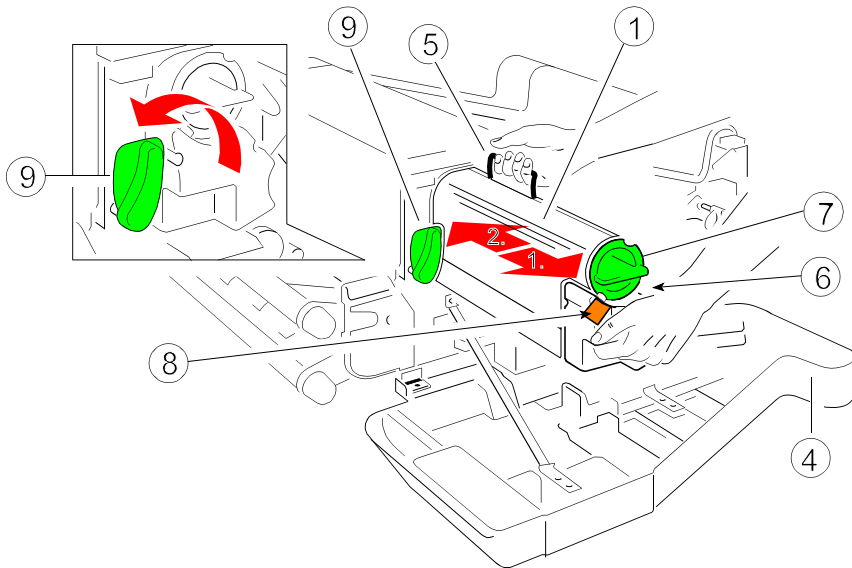
Note: Don't destroy the small plastic lip above the toner output of the Developer Unit (1).

- Insert a new Developer Unit (1) and fix it by pressing down the lever (9).
- Pull the Toner Cartridge (7) completely off the developer.

Note: An orange tape (8) is visible which is fixed to a foam block that closes the toner entrance into the developer.


- Remove the foam block from the Developer Unit.
- Activate the Toner Cartridge as described in paragraph **5.1.1 Refilling the Toner**.

Note: Change into the **OFFLINE** mode and reset the **Developer INFO** (see **BASIC SETTINGS → CONFIC MENU**).



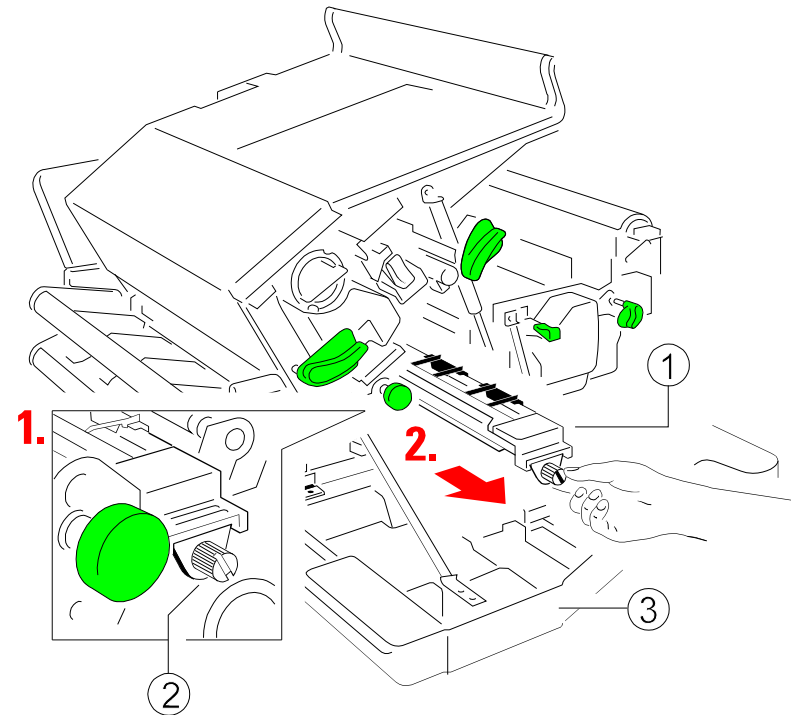
5.2.2 Replacing the Transfer Charge Unit

Note: The Transfer Charge Unit is a delicate equipment; the wire can break easily!


- Press first . **OFFLINE** will be displayed.
- Open the front (3) cover.
- Loosen the screw (2) and remove the Transfer Charge Unit (1)

Note: Now there are no obstacles to remove the Ozone Filter; see point **5.2.3**.

- Insert a new Transfer Charge Unit (1) by using the iron band guides at both sides and fix it with the screw (2).
- Close front cover (3).

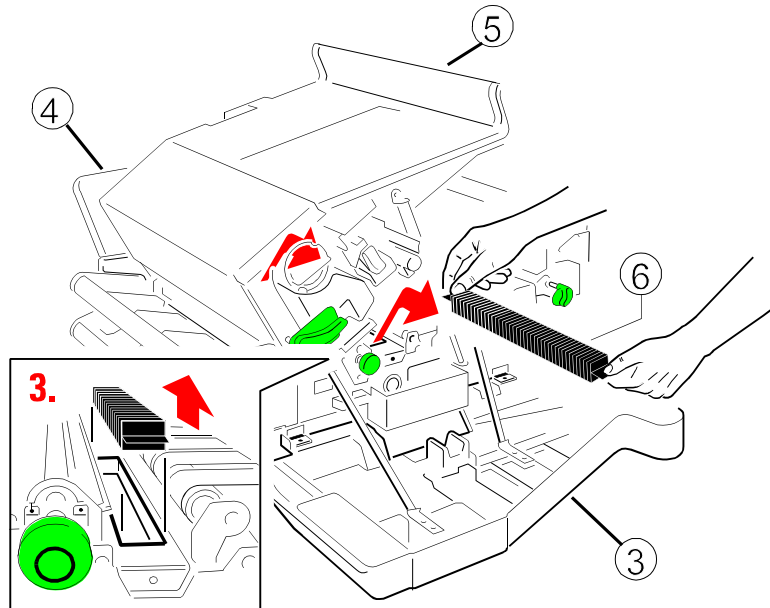


5.2.3 Replacing the Ozone Filter

- Press first . **OFFLINE** will be displayed.
- Open the front (3) and rear (4) cover.
- Press the green lever to open the top cover (5), illustrated before.
- Loosen the screw (2) and remove the Transfer Charge Unit (1), illustrated before.

Note: The Transfer Charge Unit is a delicate equipment which needs to be handled with care!

- Remove the Ozone Filter (6) by using the small tab at the side and insert the new Ozone Filter, illustrated below.
- Insert the Transfer Charge Unit by using the iron band guides at both sides and fix it with the screw (2).
- Close the top (5), rear (4) and front cover (3).



5.3 Installing the Parts of the Fuser Kit

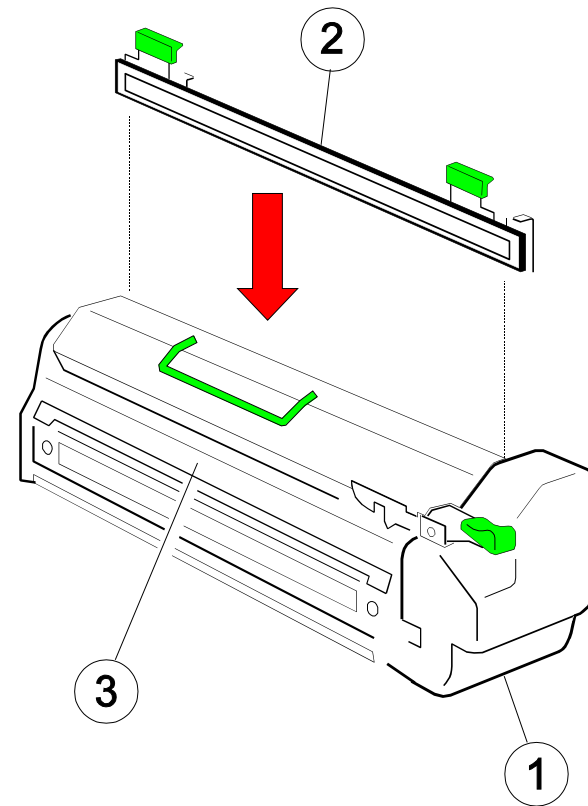
The Fuser Unit has to be replaced at regular intervals.

It is only allowed to use a Fuser Unit which has been released for the printer.

The Fuser Unit is part of the Fuser Kit which consists of:

- a Fuser Unit (1)
- a Cleaner Felt incl. Fuser Cleaner Platen (2) (if not mounted already insert it into the Fuser Unit)


Note: Take away the safety foil (3) before inserting the Fuser Unit!



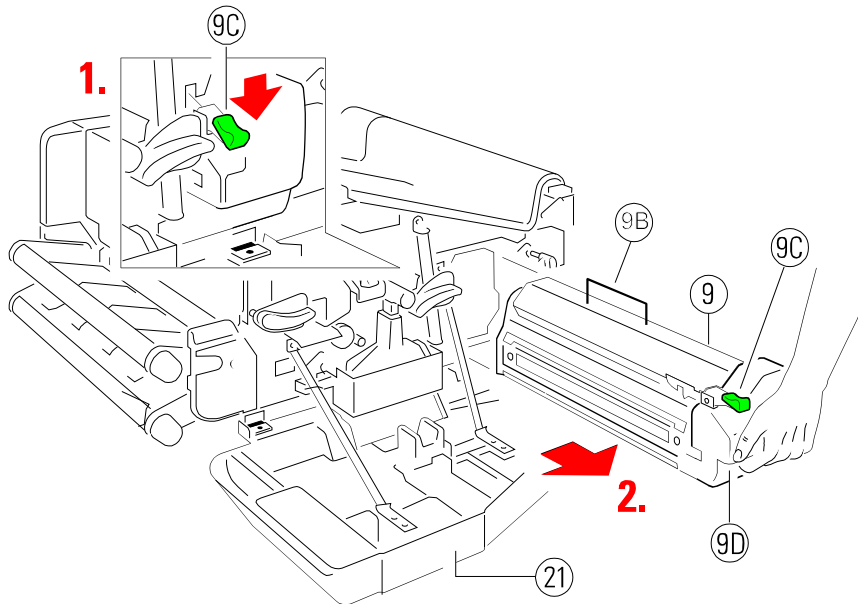
5.3.1 Replacing the Fuser Unit

Note: Don't touch the top of the Fuser Unit, it might be very hot.



- Press first . **OFFLINE** will be displayed.
- Open the front (21) cover.
- Press lever (9C) down and pull the Fuser Unit (9) on the grip (9D) about $\frac{2}{3}$ out of the housing. Grasp the grip (9B) with the other hand and pull it toward you off the printer housing.
- Insert a new Fuser Unit (9) and push it into the printer until you hear a **click**.
- Close the front (21) cover.

Note: Take away the safety foil (3) before inserting the Fuser Unit (see page before)!




Note: Change to the **OFFLINE** mode and reset the **FUSER INFO** (see **BASIC SETTINGS → CONFIG MENU**)

5.4 Replacement of the PC Cartridge (OPC)

If the print quality gets worse the PC Cartridge (8) should be replaced.

It is only allowed to use a PC Cartridge that has been released for the printer.

- Note:**
- The PC Cartridge is very light-sensitive, so it is wrapped up in lightproof foil. Carefully remove the drum from its foil container.
 - Please do not touch the green part of the PC Cartridge with your fingers. Oil and dirt degrade print quality.
 - Do not expose the light-sensitive PC Cartridge to room lighting or sunlight any longer than necessary.

- Press first . **OFFLINE** will be displayed.
- Open the front (21) cover.
- Press the lever (26) to the top to slide the Developer Unit away from the PC Cartridge.
- Remove the connector (8A).
- Press lever (8B) down and pull the PC Cartridge (8) about $\frac{2}{3}$ out of the housing and grasp the grip (8C) with the other hand and pull it toward you off the printer housing.
- Insert a new PC Cartridge by using the upper and lower iron band guides and push it into the printer until you hear a **click**.
- Mount the connector (8A).
- Fix the new PC Cartridge by pressing down the lever (26).
- Close the front (21) cover.


Note: Change to the **OFFLINE** mode and reset the **OPC INFO** (see **BASIC SETTINGS → CONFIG MENU**)

5.5 User Preventive Maintenance

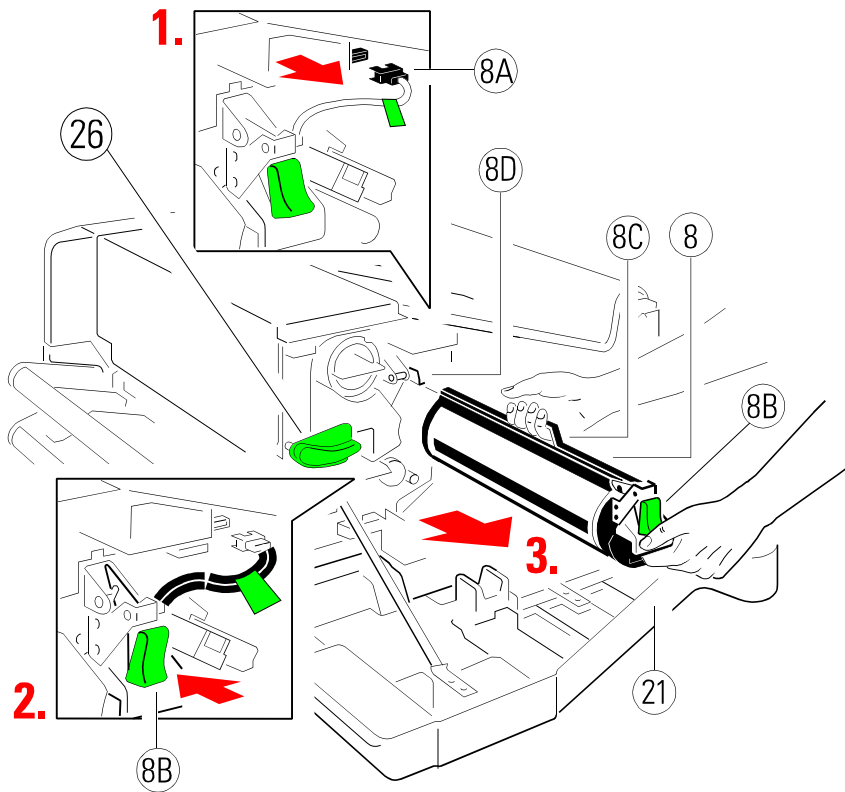
The user shall clean the paper path, tractor cassettes, and transfer charge unit regularly. The interval is depending on the type of paper used.

It is strongly recommended to use a vacuum cleaner suitable for paper and toner dust. Printing on recycled paper may further require cleaning of ozone filter located underneath the transfer charger, in order to ensure low level ozone emission.

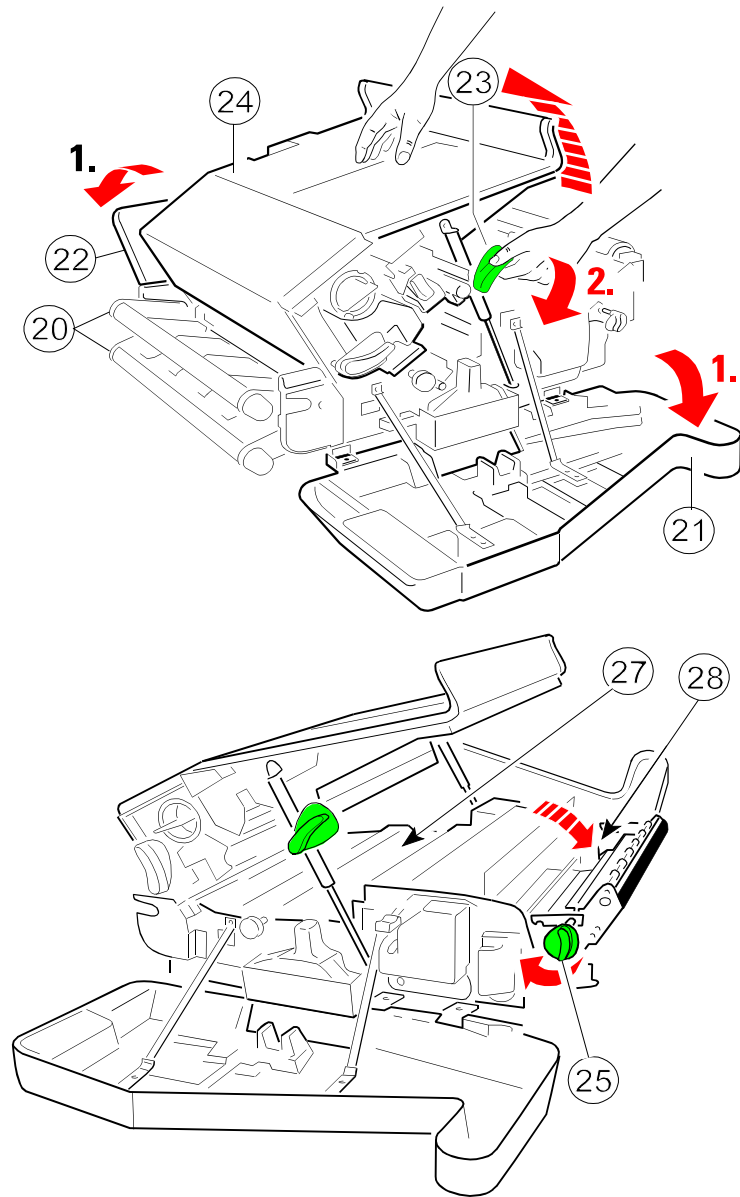
5.5.1 Cleaning the Paper Path

- Press first  . **OFFLINE** will be displayed.
- Remove the Tractor Cassettes.
- Open the front (21) and rear cover (21).
- Press the green lever (23) to open the top cover (24), illustrated below.
- Press the levers (25) to open the paper exit area.
- Use a vacuum cleaner to clean the paper path (27) and Tractor Cassettes.
- Remove paper stripes behind the Cutter Unit (28) (use a pincer if needful).
- Close all opened parts and covers and insert the Tractor Cassettes.

Note: The Tractor Cassettes, paper path (27), and paper exit area (28) should be cleaned any time when a need may arise.




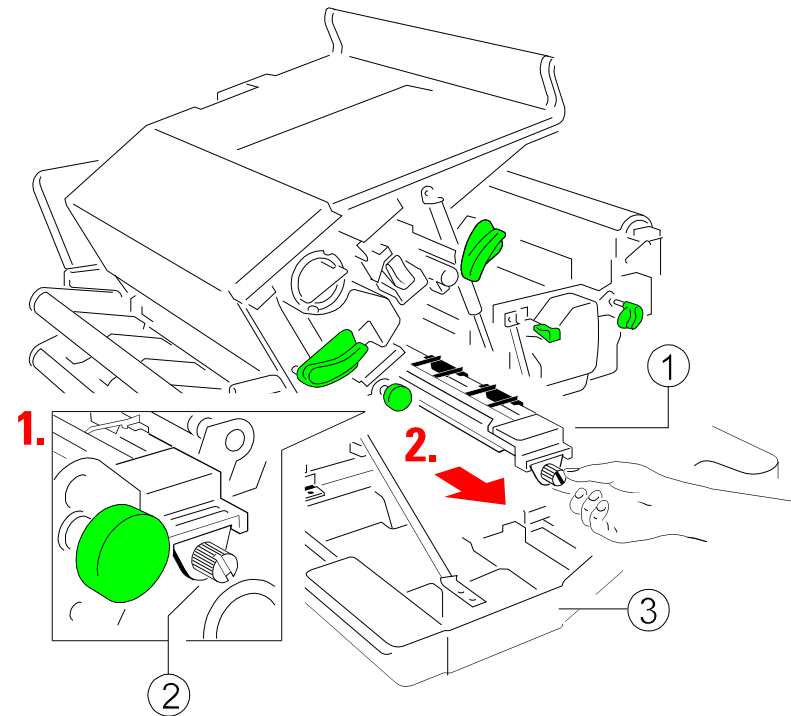
Note: Please contact your delivery agent for the recycling program of PC Cartridges!




5.5.2 Cleaning the Transfer Charger Unit

Note: The Transfer Charge Unit is a delicate equipment; the wire can break easily!

- Press first  . **OFFLINE** will be displayed.
- Open the front (3) cover.
- Loosen the screw (2) and remove the Transfer Charge Unit (1).
- Turn the Transfer Charger Unit upside down, shake it and knock with your finger onto the rear of the metal care.
- Insert the Transfer Charge Unit (1) by using the iron band guides at both sides and fix it with the screw (2).
- Close front cover (3).

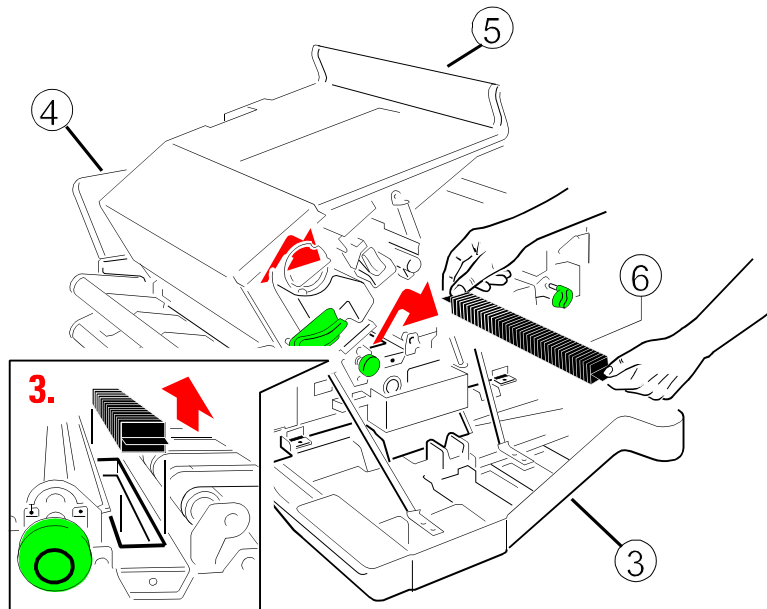


5.5.3 Cleaning the Ozone Filter below the Transfer Charger


- Press first . **OFFLINE** will be displayed.
- Open the front (3) and rear (4) cover.
- Press the green lever to open the top cover (5), illustrated before.
- Loosen the screw (2) and remove the Transfer Charge Unit (1), illustrated on page before.

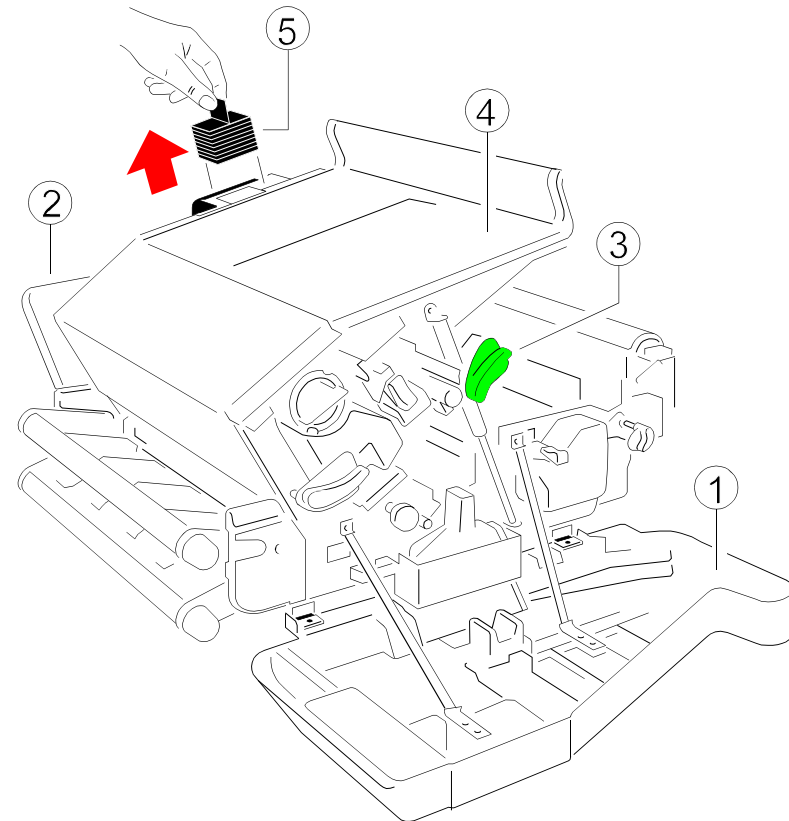
Note: The Transfer Charge Unit is a delicate equipment which needs to be handled with care!

- Remove the Ozone Filter (6) by using the small tab at the side.
- Clean the Ozone Filter (6) using a vacuum cleaner.
- Insert the Ozone Filter, illustrated below.
- Insert the Transfer Charge Unit by using the iron band guides at both sides and fix it with the screw (2).
- Close the top (5), rear (4) and front cover (3).



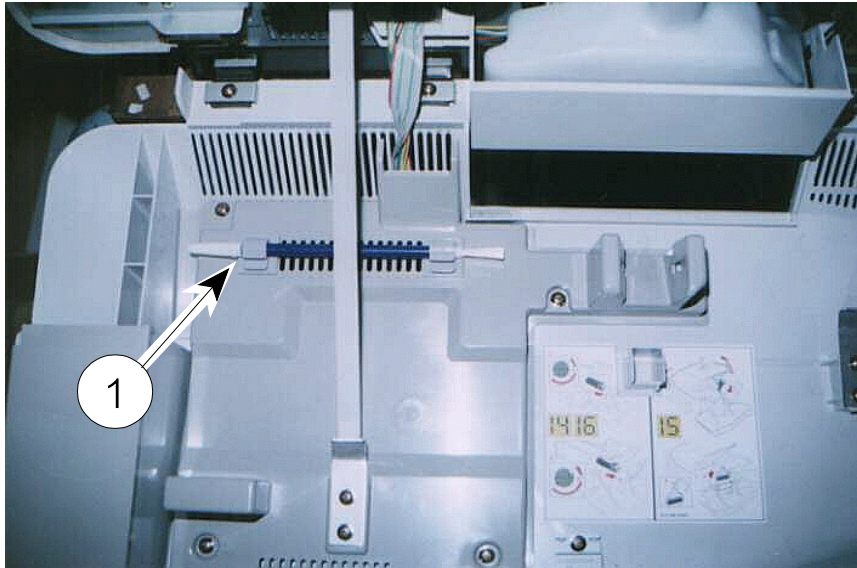
5.5.4 Cleaning the Ozone Filter in the Top Cover

- Press first . **OFFLINE** will be displayed.
- Open rear (2) cover.
- Remove the Ozone Filter (5) by using the small tab to hold the filter.
- Clean the Ozone Filter (5) using a vacuum cleaner.
- Insert the Ozone Filter (5) into the slot.
- Close the rear cover (2).



5.5.5 Tools for Cleaning

At the inside of the front cover you will find a cleaner pen (1). This tool has on one end a brush and on the other end under a cap a cleaning felt.




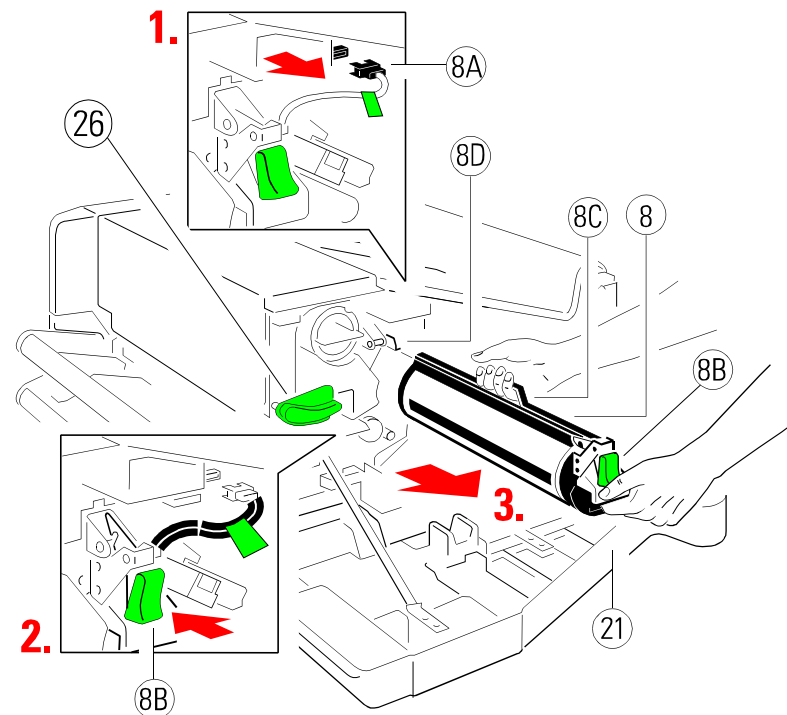
- The corona wire on the OPC can be cleaned with the felt (see Paragraph **5.5.6 Cleaning the Corona Wire**).
- The TP sensor can be cleaned with the brush (see Paragraph **5.5.7 Cleaning of the TP Sensor**).

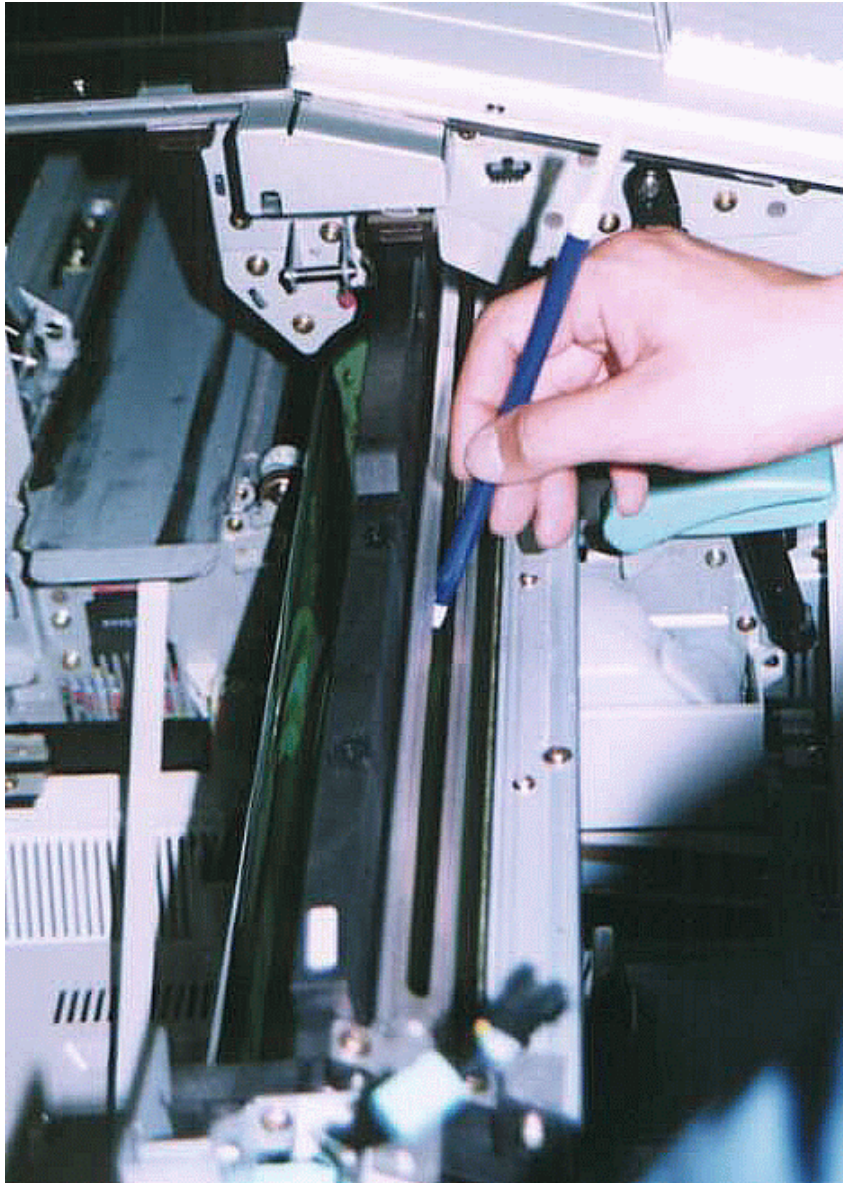
Note: The cleaner has four extra felts inside the tube. Open the brush side to get a new felt. Replace the old felt by the new one.

5.5.6 Cleaning the Corona Wire

To clean the corona wire follow the steps below:


- Press . **OFFLINE** will be displayed.
- Open the front (21) cover.
- Take the cleaning pen out of its fixture and remove the cap.
- Press the lever (26) to the top to slide the Developer Unit away from the PC Cartridge.
- Remove the connector (8A).
- Press lever (8B) down and pull the PC Cartridge (8) out of the housing until the slot over the corona is free. Now grasp the grip (8C) with the other hand to hold the PC Cartridge.
- Use the felt to clean the corona wire carefully as shown in the photo next page.
- Push the PC Cartridge into the printer until you hear a **click**.
- Mount the connector (8A).
- Fix the PC Cartridge again by pressing down the lever (26).
- Fix the cleaning tool on its place
- Close the front (21) cover.





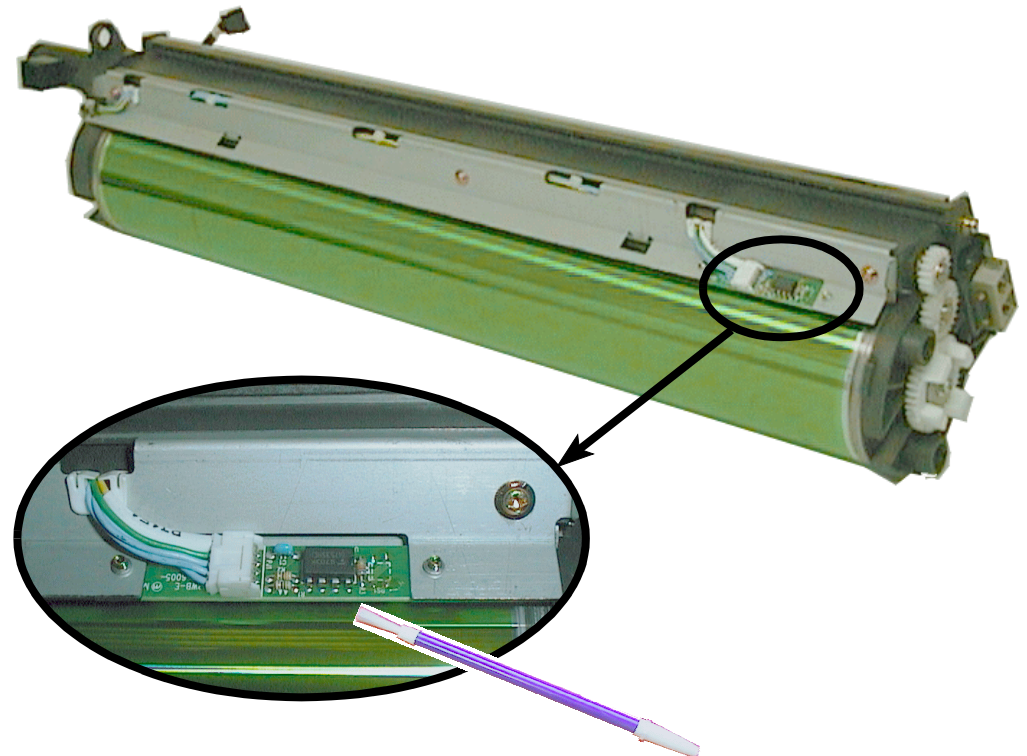
5.5.7 Cleaning of the TP Sensor

After opening the top cover you can see the TP sensor at the end of the OPC.

- Press . **OFFLINE** will be displayed.
- Open the front, rear, and top cover
- Take the cleaning pen.
- To protect the printer against toner dust put a piece of paper below the TP sensor into the printer.
- Clean the TP sensor with the brush by moving the brush between the OPC and the TP sensor.

Note: The rest toner is falling down onto the piece of paper. Take the paper with the toner dust carefully out of the printer.

- Fix the cleaning tool on its place
- Close all covers.



6 Troubleshooting and Diagnostics

How to Use This Section

1. Find the category to which your problem belongs. The problem categories are:
 - Power-related Problems
 - Error Messages
2. Find the symptom description that most closely matches the printer symptom.
3. Try the first suggestion under that heading.
4. If none of the suggestions enables you to continue printing, or if the fault is not listed, contact your service agent. Every time the printer is switched ON an internal selftest is started.

After power **ON** the display signals the message:

Memory-Test!
Please wait ...

After successful completion two messages pop up on the display shortly after each other, with n = 1 up to 10 (PP 4050) resp. 1 up to 50 (PP 4050XP) (number of the last chosen Profile):

OFFLINE (n)
PCL

Then all fields of the display shortly show black squares and a short beep sounds; power **ON** is indicated by the green LED at the control panel.

The following message appears:

ONLINE (n)
WARMING UP

Then the display changes into:

ONLINE (n)

If an error message is displayed please refer to section 2.3 **Status and Error Messages** and 6.2 **Error Messages**.

6.1 Power-related Problems

Display elements do not lit when power is switched On


- Check that the power cord and plug are securely fitted to the printer and to the walls outlet.
- Ask for the power connector connections (and fuse, if fitted) to be verified.

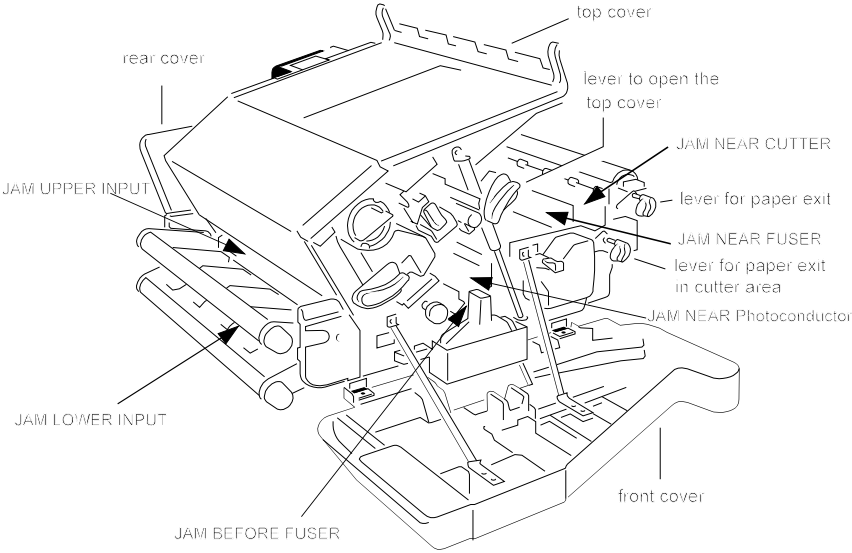
6.2 Status and Error Messages

After selftest the printer enters the **ONLINE** mode.

In case of a failure the printer changes into the **OFFLINE** state and one of the following messages may appear on the display:

Display	That means...	Measure
00 POWER SAVE	After a period of time defined by the parameter power save without printing the printer changes into the state power save Power Consump. < 45 W	The next print job changes the status
02 WARMING UP	Warming up before printing	Wait
11 REMOVE PAPER	Paper in the paper path has to be removed	Remove paper, if necessary cut it before (s. Page 4-1 CUT FORM) and insert it again
12 COVER OPEN	Front, rear, or top cover is open	Close cover


Display	That means...	Measure
13 JAM BEFORE FUSER	Paper jam at position ...	Clear the paper path; see figure below
13 JAM UPPER INPUT	... between transfer and fuser area	If there is no jam visible or even no paper inserted into the printer dirty sensors might be the cause for the error message. Clean the optical sensors and the paper path around them with a soft, dry cloth.
13 JAM LOWER INPUT	... near to the upper paper input	
13 JAM NEAR PC-CART.	... near to the lower paper input	
	... near to the PC-Cardridge	... and set paper to park position
13 JAM NEAR FUSER	... near to the Fuser unit	
13 JAM NEAR CUTTER	... near to the cutter position or in the paper exit area	
	... pendulum of intelligent paper stacker iPS 4050/406	Stack the paper properly by manual intervention. Tear off the paper and reload it properly. If there is no real jam in the iPS but the sensor was activated, press  to continue.







Note: For recovery after paper jam see next pages!

In case of a paper jam the printer automatically performs a recovery. The number of pages which are reprinted depends on the physical paper length.

Paper length	Recovery of
≥ 15 inch	1 page
7½ inch up to 14 ⁵ / ₆ inch	up to 2 pages
5 inch up to 7¼ inch	up to 3 pages
3¾ inch up to 4 ⁵ / ₆ inch	up to 4 pages
3 inch up to 3½ inch	up to 5 pages

Display	That means...	Measure
14 TONER EMPTY	No toner	Insert a new toner cartridge (see Chapter 5.1.1)
15 CHK TONER BOTTLE	Waste Toner Bottle is full or the bottle's neck is dirty	Replace the Waste Toner Bottle (see Chapter 5.1.2) or clean the bottle's neck.
16 TONER LOW	Toner will be less, but continue printing until the printout is not dark enough	order a new Toner Kit
17 INSTALL UNIT <i>n</i>	The printer is missing a unit; <i>n</i> = 4 No Transfer Charge Unit is installed. 8 No Waste Toner Bottle is installed. 16 The Fuser Unit is not installed. 32 No Developer Unit is installed. 64 No PC-Cartridge is installed.	Install the Transfer Charge Unit (see Chapt. 5.2.2) Install the Waste Toner Bottle (Chapt. 5.1.2) Install the Fuser Unit (see Chapt. 5.3.1) Install the Developer Unit (see Chapt. 5.2.1) Install the PC-Cartridge (see Chapt. 5.4)
31 LOAD LOWER 32 LOAD UPPER	No paper	Load paper into the tractor - if necessary insert empty pages (s. Page 4-1 FORM FEED) and press  .

Display	That means...	Measure
35 STACKER FULL		Remove paper from the iPS and press  .
36 STACKER BUSY	The Paper Exit Tray of the iPS is moving up and down and stops at working position	wait
37 WRONG PG. LENGTH	If PAPER LENGTH in the PAPER MENU is set to a value less than 7 inch or greater than 17 inch the WRONG PAGELENGTH message is displayed. If the paper length is less than 7 inch the movement of the pendulum will be for a page length of 7 inch, and greater than 17 inch a movement for a page length of 17 inch.	See in Chapter 4.2.1 PAPER MENU the parameter LENGTH FACTOR After pressing  the printer continued the print job. A correct stacking can not be guaranteed since the paper length is exceeding the operating range of the stacker.
38 STACKER ERROR	Error when reading the EEPROM of the stacker. The stacker is further operational but the parameter setting after the last power off has been lost.	In case of a malfunction of the pendulum new paper must be inserted because the information about the paper felt has been lost. Error still there: call service.
39 EEPROM LIFE	Warning: The typical life cycle of the EEPROM is reached. The stacker is further fully operational until a program error occurs. The EEPROM should be changed	After pressing  the printer continued the print job. Call service to change the EEPROM

Display	That means...	Measure
52 SERVICE FUSER <i>n</i>	Problem with the Fuser; <i>n</i> = 16 The main heater is unusually in high temperature. 32 The main heater is unusually in low temperature. 64 The main heater is warming up, but does not reach the selected temperature within a given time.	Power off and on; if error still there replace the Fuser Unit (see Chapt. 5.3.1) or call service
57 SERVICE CHARG <i>n</i>	Problem with the Transfer Charge Unit; <i>n</i> = 2 The eraser lamp is open. 8 Short cut in developer bias. 16 Short cut in detach charger. 32 Short cut in transfer charger. 64 Short cut in main charger.	Power off and on; if error still there: Call service Call service Call service Replace the Transfer Charge Unit (see chapter 5.2.2) Call service
58 SERVICE MOTOR <i>n</i>	Motor trouble; <i>n</i> = 2 The fuser retract motor does not work correctly. 4 The fuser motor does not work correctly. 8 The transfer roller release motor does not work correctly. 32 The tractor motor does not work correctly. 64 The PC-Cartridge motor does not work correctly. 130 The buffer arm motor does not work correctly.	Power off and on; if error still there call service
59 DEV. MOTOR FAULT	The developer motor does not work correctly.	After pressing  the printer continues the print job.

Display	That means...	Measure
64 SERVICE FAN <i>n</i>	Fan trouble; <i>n</i> = 2 The ozone exhaust fan stopped. 4 The paper suction fan stopped. 8 The upper frame fan stopped. 16 Main cooling fan stopped. 32 Fuser fan stopped. 64 PCU fan is stopped.	Power off and on; if error still there call service
70 SERVICE SOFTW. <i>n</i>	Software error; <i>n</i> = 2 Error in the printer engine hardware detected. 4 Reserved 8 NVRAM error detected. 16 Controller communication protocol overrun. 32 Insufficient memory. 64 The printer engine was confused or a condition conflict occurred.	Power off and on; if error still there call service

Display	That means...	Measure
71 TPS ERROR <i>n</i>	<p>Toner Patch Sensor face is not ok; <i>n</i> =</p> <p>4 Not enough toner; the toner adjustment does not work correctly.</p> <p>8 TP too light; unable to continue printing.</p> <p>32 TP too dark; unable to continue printing.</p>	<p>One of these error messages (most 4, 8, or 32) can indicate a hardware malfunction but might also be caused by toner contamination on the surface of the TP sensor.</p> <ul style="list-style-type: none"> - Remove the PC-Cartridge off the printer and turn it. - Clean the sensor's surface by means of the cleaning pen (see Paragraph 5.5.7 Cleaning of the TP Sensor). <p>Be careful not to scratch the drum.</p> <p>Note: Do not expose the drum to light any longer than necessary.</p> <p>24 = 71 TPS ERROR 8 and/or 16 TONER LOW</p> <p>48 = 71 TPS ERROR 8 and/or 16 TONER LOW</p> <p>If error still there call service</p>

Display	That means...	Measure
72 TPS LEVEL SHIFT	<p>Toner Patch Sensor is dirty</p> <p>or</p> <p>OPC has background</p>	<p>Clean the sensor's surface by means of the cleaning pen (see Paragraph 5.5.7 Cleaning of the TP Sensor).</p> <p>Be careful not to scratch the drum (see figure below). Do not expose the drum to light any longer than necessary.</p> <p>Check OPC surface, if background is not ok replace the OPC (see Paragraph 5.4 Replacement of the PC Cartridge (OPC) *)</p>
73 ATDC ERROR <i>n</i>	<p>ATDC Sensor is dirty; <i>n</i> =</p> <p>8 ATDC too light</p> <p>32 ATDC too dark</p>	<p>open and close front cover, if error still there exchange Developer (see Paragraph 5.2.1 Replacing the Developer Unit *)</p>
74 CLEAN TPS	Toner Patch Sensor dirty	<p>Open the housing, clean the sensor's surface by means of the cleaning pen (see Paragraph 5.5.7 Cleaning of the TP Sensor).</p> <p>Close the housing</p> <p>Be careful not to scratch the drum (see figure below). Do not expose the drum to light any longer than necessary.</p>

*) After replacing the Developer Unit, the PC Cartridge, or the Fuser Unit the Reset functions (CONFIG MENU → BASIC SETTINGS) have to be called up.
Remove all transportation locks before replacing the units.

Display	That means...	Measure
80 EXCHANGE OPC	PC-Cartridge has reached its end of life	Replace the PC-Cartridge *)
82 EXCHANGE DEVELOPER	Developer has reached its end of life	Replace the Developer *)
83 EXCHANGE FUSER	Fuser has reached its end of life	Replace the Fuser *)
90 LD STACKER Vx.xx	Message during loading a new stacker firmware	
91 UPD. STACKER FW	Message during loading the stacker firmware	
92 STACK. COM ERROR	Communication error between printer and stacker; Cable defective	<ul style="list-style-type: none"> - Check power cable - Check interface cable - Power OFF/ON again
93 STACK. PROG. ERR	Program error in the stacker	<ul style="list-style-type: none"> - Power OFF/ON again - Call service to load new firmware
94 STACK. INTERN-ERR.	Program error in the stacker	<ul style="list-style-type: none"> - Power OFF/ON again - Call service
95 SERVICE STACK. 0	Hardware error	<ul style="list-style-type: none"> - Power OFF/ON again - Ensure that mechanics are not blocking - Call service

*) After replacing the Developer Unit, the PC Cartridge, or the Fuser Unit the Reset functions (CONFIG MENU → BASIC SETTINGS) have to be called up.

Remove all transportation locks before replacing the units.

7 Technical Data

The technical data specified in this chapter are applicable to a printer equipped with the standard configuration, **parallel interface** for PP 4050, **parallel port** and **Ethernet interface** for PP 4050XP/4650.

Print Speed:	26 pages per minute (11 inch form length) 24 pages per minute (12 inch form length) 34 pages per minute (A4 landscape) 1,700 lines/minute at 6 lines/inch
Resolution:	PP4050/4050XP/4050 MICR: 300x300 dots per inch PP4650: 600x600 dots per inch
Workload:	150,000 pages per month
Print Principle:	Electrophotographic , LED array, organic photo-conductor, two component toner/developer, heat and pressure roller system with adjustable fusing temperature
Emulations / PDL:	HP LaserJet 4 (PCL 5e, PjL), HP - GL/2 PCL 5 and PjL Extensions
Fonts:	45 scalable fonts, 10 bitmap fonts
Resident Barcodes:	Code 39, Code 39 HP compatible, Code 93, Code 128, Codabar, 2/5 industrial, 2/5 interleaved, EAN 8/13 add2/5 , UPC-A add 2/5, UPC-E add 2/5, Postnet, KIX Code, MSI, Datamatrix Code
System Interfaces:	PP 4050: Parallel IEEE 1284 PP 4050XP/ Parallel IEEE 1284 and PP4650 : Ethernet 10 Base T, 10/100 Mbs
Control Panel:	Four line, 20 characters LCD display with four keys
Diagnostics:	Selftest, Hexdump, Built in Diagnostics

Paper Handling	Paper Transport: Continuous form media with tractor feed pin holes; paper retract, sero tear off															
	Paper Input: Two independent, detachable tractor cassettes															
	Paper Output: Either to Stacker exit or to the top (Stacker for about 200 cut sheets)															
	Paper Cutter: Integrated cutting device for print job separation															
Paper Formats (For detail see Chapter 8 Paper Specification)	<table><tr><td></td><td>Minimum</td><td>Maximum</td></tr><tr><td>Physical Width:</td><td>4 inch</td><td>17 inch</td></tr><tr><td>Print Width:</td><td>0.5 inch</td><td>16 inch</td></tr><tr><td>Length printer:</td><td>3 inch</td><td>24 inch</td></tr><tr><td>Length iPS:</td><td>7 inch</td><td>17 inch</td></tr></table>		Minimum	Maximum	Physical Width:	4 inch	17 inch	Print Width:	0.5 inch	16 inch	Length printer:	3 inch	24 inch	Length iPS:	7 inch	17 inch
	Minimum	Maximum														
Physical Width:	4 inch	17 inch														
Print Width:	0.5 inch	16 inch														
Length printer:	3 inch	24 inch														
Length iPS:	7 inch	17 inch														
Paper Weight:	64 g/m ² to 155 g/m ² (17 lb. to 41 lb.)															
Physical Dimensions Printer:	<table><tr><td>incl. tractor cassettes:</td><td>890 x 350 x 780 mm (WxHxD) 34.7 x 13.65 x 30.45 inch</td></tr><tr><td>incl. iPS:</td><td>1120 x 1160 x 780 mm (WxHxD) 43.7 x 45.25 x 30.45 inch</td></tr></table>	incl. tractor cassettes:	890 x 350 x 780 mm (WxHxD) 34.7 x 13.65 x 30.45 inch	incl. iPS:	1120 x 1160 x 780 mm (WxHxD) 43.7 x 45.25 x 30.45 inch											
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incl. iPS:	1120 x 1160 x 780 mm (WxHxD) 43.7 x 45.25 x 30.45 inch															
Weight: (consumables included)	<table><tr><td>Printer:</td><td>112 kg (247 lbs.)</td></tr><tr><td>Printer and iPS:</td><td>164 kg (360 lbs.)</td></tr></table>	Printer:	112 kg (247 lbs.)	Printer and iPS:	164 kg (360 lbs.)											
Printer:	112 kg (247 lbs.)															
Printer and iPS:	164 kg (360 lbs.)															
Mains Supply:	110 - 110 V (-10/+6%) AC 110 - 120 V (-10/+6%) AC 220 - 240 V (-10/+6%) AC 50 - 60 Hz															

Power Consumption:	Operating, Power: < 1.200 W average (< 1.650 W peak during warming up) Operating, Current: < 12 A average (< 15 A peak at 110 V, or < 7.5 A peak at 220 V during warming up) Stand by: < 400 W Power Save: < 45 W
Control Unit PP4050 and PP 4050 MICR:	Processor: 32 bit RISC (AMD 29240) Data Memory: 16 MB DRAM Program Memory: 4 MB FLASH EPROM allows on site software update Stacker Control: Supports attached intelligent Paper Stacker iPS 4050/4060
Control Unit PP 4050XP/ PP4650:	Processor: APPC Pentium / Power PC Data Memory: 64 MB DRAM Program Memory: 8 MB FLASH EPROM allows on site software update Stacker Control: Supports attached intelligent Paper Stacker iPS 4050/4060
Noise Emission:	≤ 55 dB(A) operating
Agency Approvals:	VDE / GS, UL, C-UL, CE, FCC
iPS 4050/4060:	Physical Dimensions: 940 x 750 x 660 mm (WxHxD) 36.6 x 29.25 x 27.75 inch Capacity: 3,000 pages of 70 g/m ² Paper width: 6 up to 18 inch Paper length: 7 up to 17 inch

Environmental Conditions:	Operating: + 15 to + 35°C (+ 59 to + 95°F), 30 to 50 % rel. humidity Note: For best performance, store and use fanfold paper at 19° to 23° C (68° to 73°F) and a relative humidity of 33 to 47 percent. Storage: - 20 to + 40°C (- 4 to 104°F), 95 % rel. humidity (40°C) Note: Storage of the printer including the consumables is possible for 18 months from the date of delivery.
Life Cycle - Printer:	up to 9,000,000 pages Note: All life cycle values for the consumables are based upon the reference page of 15 x 11 inch
Life Cycle - Consumables:	Toner Kit: PP 4050/4050XP/ PP4650 up to 140,000 pages per Toner Kit at 5% density PP 4050 MICR up to 128,000 pages per Toner Kit MICR at 5% density and 320,000 pages at 2% density Photoconductor: up to 150,000 pages Developer: PP 4050/4050XP/ PP4650 up to 230,000 pages PP 4050 MICR up to 200,000 pages Fuser Unit: up to 500,000 pages
Storage of Consumables:	- 10 to + 40°C (- 4 to 104°F), 95 % rel. humidity (40°C) Note: Storage of Toner Kit, PC Cartridge, and Developer Kit is possible for 18 months and for the Fuser Kit up to 24 months from the date of delivery.

8 Paper Specification

8.1 Basic Theory of Operation

Laser printers use the electrophotographic technology. The laser beam writes an electrostatic image onto a rotating photosensitive drum (Photoconductor). As this image passes the developer station, a dry, powdery toner is attracted to the image areas. The developed image then advances to the transfer station where the drum contacts the fanfold paper and the toner image is electrostatically transferred onto the paper. After transfer, the paper passes through the fuser where heat and pressure are applied and the toner fuses (melts) onto the paper. The fanfold paper is then deposited to the paper exit.

To create the printed image, all print media must be transported through the printer, charged electrostatically, and heated. This is why paper properties such as electrical resistivity, caliper, finish, and stiffness can affect the print quality and paper handling performance of the laser printer.

8.2 Storing Media

Follow these guidelines when stacking and storing fanfold paper:

- Do not store cartons with fanfold paper directly on the floor. Place cartons on a pallet or on shelves.
- The carton itself must have a relative humidity of 33 up to 47 % at a temperature of 19° to 23° C (68° to 73° F). Otherwise the humidity penetrates from the carton into the fanfold paper.
- Do not store the fanfold paper near heating elements, water pipes, open windows, clammy walls, or in direct sunlight.
- The fanfold paper in the carton and plastic wrap should be stored at a room temperature of 18° to 24° C (65° to 75° F) and of a relative humidity of 40 to 60 %.

8.3 Environmental Considerations

The printer is designed to operate in a wide range of environmental conditions. For best performance, store and use fanfold paper at 19° to 23° C (68° to 73° F) and a relative humidity of 33 to 47 percent.

Follow these guidelines when media is used in an environment outside the temperature and humidity ranges:

- Do not expose the paper to humidity or temperature extremes. If paper is left unwrapped or on the paper input shelf of the stacker, extreme changes in the environment will cause the paper to take on unwanted properties.
- In the case of humidity extremes, keep paper tightly wrapped in plastic.
- If a significant temperature difference occurs between the paper storage area and the printer's operating environment, before unwrapping the paper, allow it time to adjust to the temperature in the printer's operating environment. The greater the temperature difference and the greater the amount of paper to acclimate, the longer this time period should be. Allow one day for every 10° C (18° F) difference in temperature between storage environment and printing environment.

8.4 Guidelines and Specifications for Selected Fanfold Paper

Properties of fanfold paper are subject to change. It is the user's responsibility to monitor the quality of the paper.

The printer is designed to print onto standard electrophotographic (laser type) paper. Because there are many types of media and variations can occur in the process of manufacturing media, it is important to select the best media for the printing application.

8.4.1 General Guidelines

– Quality

The printer works best with high-quality media. Quality fanfold media for the laser printer is characterized by uniform physical properties, freedom from dust and lint, accurate fold, and proper packaging. Proper packaging protects media from moisture and physical damage.

Avoid paper with curled or bent edges, spots, dust or lint, wrinkling, or inaccurate size. All these characteristics can cause misfeeding, jamming premature wear out of printer parts, or unsatisfactory print quality.

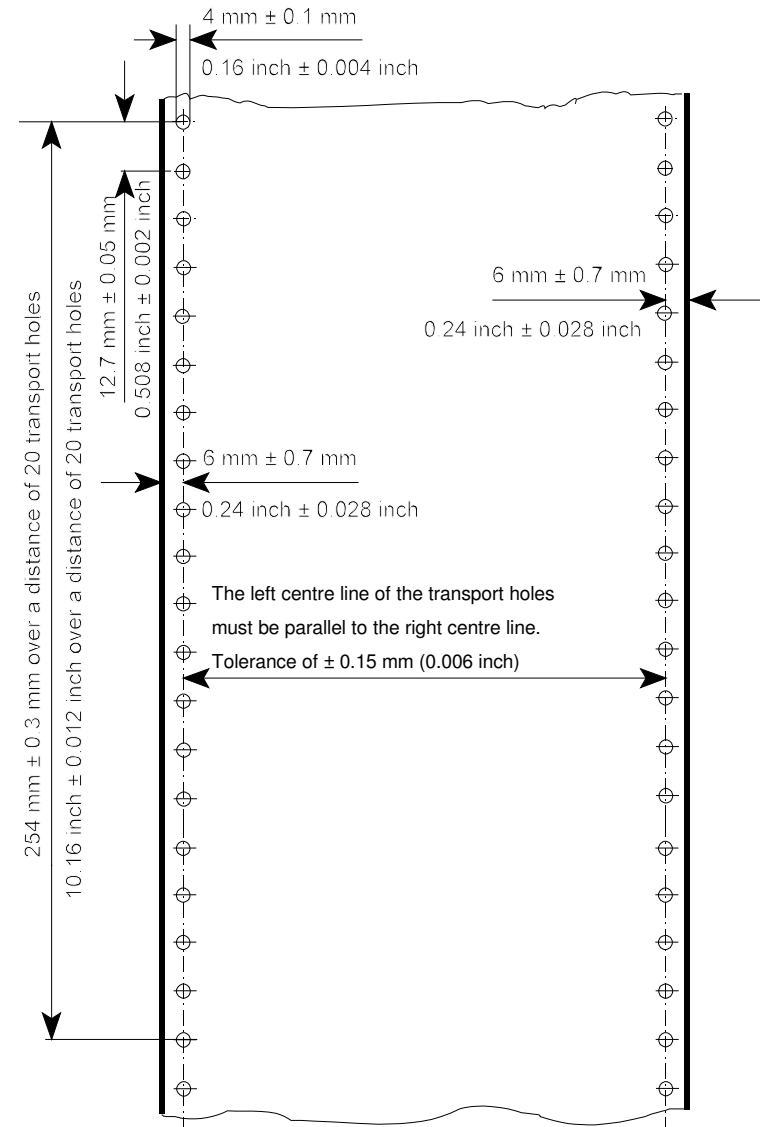
– Basis weight

Basis weight (also called grammage) is an important characteristics of paper. Paper that is too light or too heavy can cause misfeeds, misstacking, paper jams, poor image quality, or excessive mechanical wear out in the printer.

The range of paper weight is from 64 to 155 g/m² ± 5% (17 to 41 lb).

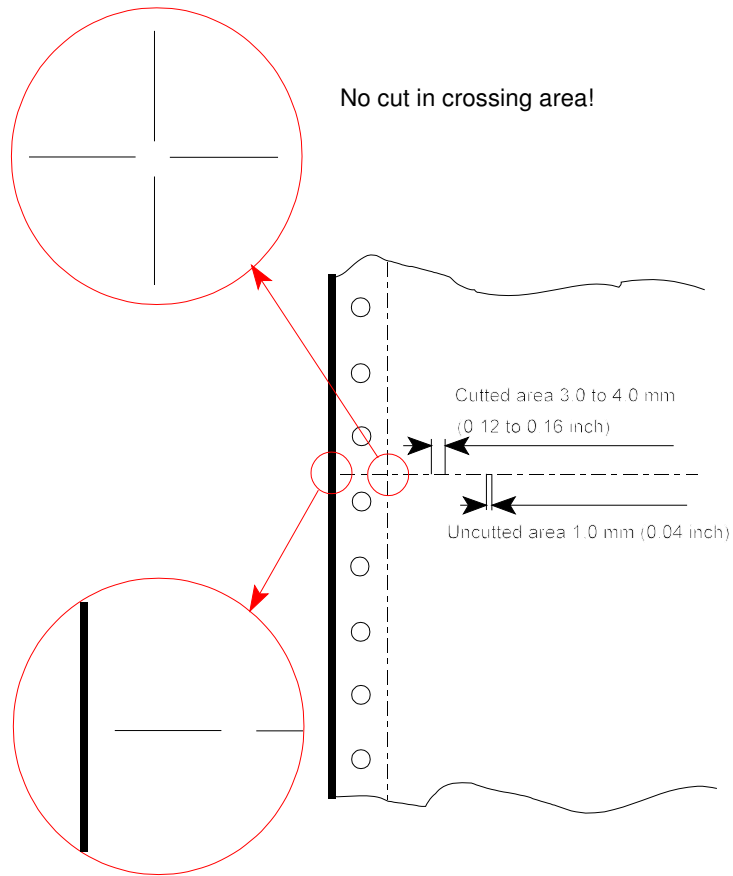
– Transport holes

Note: All measurements conditioned at 23° C (68° F) and 50% RH



– Perforation

Note: All measurements conditioned at 23° C (68° F) and 50% RH



8.4.2 Typical Paper Properties for Laser Printers

Description	Specifications	Applicable Standard / Method
curl	5mm (0.2 inch);no diagonal curl at conditioned (23 ± 2)° C and (15 ± 5) % RH	
stability of dimension cross to paper path	maximum 0.8% in heat chamber at 110° C for 20 minutes	
electrical surface resistivity	10 ⁸ to 10 ¹⁰ ohms/square inch (conditioned at 23° C and 50% RH)	PTS-P: 101/84
electrical volume resistivity	< 10 ¹⁰ ohms/square inch (conditioned at 23° C and 50% RH)	DIN 53 482
high-temperature stability	< 0.4 %	DIN 54 354
raise dust	no loose parts; paper should be free from dust	DIN 53 109
fusing compatibility	must not scorch, melt, offset, or release hazardous emissions when heated to 190° C (395° F) for nearly 0.1 second	FOGRA-Method

8.4.3 Paper/Form Properties

Description	Specifications	Applicable Standard / Method
basic weight	64 to 155 g/m ² ± 5% (17 to 41 lb)	DIN EN ISO 536
condition	no callous, folds, holes, no raised parts	
relative humidity	(40 ± 7) % at (21 ± 2)° C	DIN EN ISO 287
specific volume	1.3 ± 0.2 cm ³ /g	DIN EN ISO 438
arch	maximum 5 mm	DIN 6724
bending force	minimum 0.1 Nmm	DIN 53 121
humidity stretching	for every 10% difference of humidity between 40 and 60% length maximum 0.04% cross maximum 0.2%	DIN 53 130
smoothness by Bekk	minimum 18s; maximum 30s	DIN 53 103
porosity by Bendtsen	5.3 ± 2.5 µm / (Pa × s)	DIN 53 120
humidity entering (Cobb 60)	23 ± 5 g/m ²	DIN 53 132
pH-value	> 5.0	DIN 53 124
opacity	> 75 %	DIN 53 146
paper width	minimum: 4 inch (101.6 mm) maximum: 10 inch (254 mm)	

Description	Specifications	Applicable Standard / Method
Paper length: Printer with iPS Printer without iPS	minimum: 8 inch maximum: 16 inch minimum: 3 inch maximum: 20 inch	
relative humidity	(40 ± 7) % at (21 ± 2)°C	DIN EN ISO 287
difference between humidity of paper and ambience	maximum 10% RH	
difference between paper and room temperature	maximum ± 2° C	
batch incline	12 mm for a pile of paper 50 mm high	
distance between centre of transport hole and paper edge	6.00 mm ± 0.7 mm	DIN EN ISO 2784
diameter of transport holes	4.00 mm ± 0.1 mm	DIN EN ISO 2784
breaking strength of perforation	16 ± 2 N / cm	

8.4.4 Label Carrier Properties

Description	Specifications	Applicable Standard / Method
specific volume	$(1.3 \pm 0.2) \text{ cm}^3/\text{g}$	DIN EN ISO 438
arch	maximum 5 mm	DIN 6724
break stability	vertical minimum 85 N horizontal minimum 40 N	DIN 53 112
crack stability	minimum 150 kPa	DIN EN ISO 2758
roughness by Bendtsen	200 to 500 ml/mim	DIN EN ISO 2494
bending force	minimum 0.1 Nmm	DIN 53 121 measure distance: 10 mm bending angle 12°
humidity stretching	for every 10% difference of humidity between 40 and 60% length maximum 0.04% cross maximum 0.2%	DIN 53 130
electrical surface resistivity	10^8 to 10^{10} ohms/square inch (conditioned at 23° C and 50% RH)	PTS-P: 101/84

8.4.5 Label Properties

Description	Specifications	Applicable Standard / Method
condition	no callous, folds, holes, no raised parts	DIN 6730
specific volume	$(1.3 \pm 0.2) \text{ cm}^3/\text{g}$	DIN EN ISO 438
arch	maximum 5 mm	DIN 6724
break stability	vertical minimum 65 N horizontal minimum 40 N	DIN 53 112
roughness by Bendtsen	200 to 500 ml/mim	DIN EN ISO 2494
bending force	minimum 0.1 Nmm	DIN 53 121 measure distance: 10 mm bending angle 12°
humidity stretching	for every 10% difference of humidity between 40 and 60% length maximum 0.04% cross maximum 0.2%	DIN 53 130
electrical surface resistivity	10^8 to 10^{10} ohms/square inch (conditioned at 23° C and 50% RH)	PTS-P: 101/84
electrical volume resistivity	$< 10^{10}$ ohms/square inch (conditioned at 23° C and 50% RH)	DIN 53 482
relative humidity	$(40 \pm 7) \%$ at $(21 \pm 2)^\circ \text{C}$	DIN EN ISO 287

Description	Specifications	Applicable Standard / Method
difference between humidity of paper and ambience	maximum 10% RH	
difference between paper and room temperature	maximum $\pm 2^{\circ}\text{C}$	
curl	5mm (0.2 inch); no diagonal curl at conditioned $(23 \pm 2)^{\circ}\text{C}$ and $(50 \pm 5)\% \text{RH}$	DIN 6724
stability of dimension cross to paper path	maximum 0.8% in heat chamber at 110°C for 20 minutes	
removable stability	$(2.0 \pm 0.2) \text{ cN} / 10 \text{ mm}$	FINAT FTM 3
high-temperature stability	$< 0.4\%$ no dropping of glue particles	DIN 54 354

Note: Cutting through a sticky label leaves glue on the blade, leading to problems with the cutting device. Small parts of a cut through label could detach from its paper and block the cutter or the paper path completely.

[illegible]

9.3 Developer Kit

[illegible]

9.4 Fuser Kit

[illegible]

9.5 Inspection Report

[illegible]

9.6 Customer Remarks

[illegible][illegible]

Appendix A Programming Guide

The printer supports the PJI Printer Job Language and PCL5 Printer Language.

All the printer's unique features and functions can be controlled by the application software via PJI or PCL5 commands.

Among those functions are the following:

- Job Control Support using profiles see paragraph A-1.1
- Support of various paper sizes see paragraph A-1.2
- Paper path control see paragraph A-1.3
- Support of semigraphics for application under SAP/R3 see paragraph A-1.4
- Euro symbol support for a restricted number of code pages and type faces see paragraph A-1.5
- Support of Logical and Physical Pages see paragraph A-1.6
- Support of Job Separation see paragraph A-1.7
- Printer set up configuration via PJI commands see chapter A-2
- Printer set up configuration via PCL5 commands see chapter A-3
- Support of 13 resident bar codes by special PCL5 command see chapter A-5

Note: For more information regarding PJI and PCL5 programming please refer to the

- PJI Printer Job Language (5961-0704)
- PCL5 Printer Language Technical Reference Manual (5961-0509) published by Hewlett-Packard® Company.

A-1 Support of Printer Specific Features and Functions

The Fanfold Laser Printer provides programming support of Printer Specific Features and Functions. These Functions are implemented with special Printer Job Language commands. The following hints show in combination with application examples how to use and program these functions:

A-1.1 Profiles

The printer can store up to 10 (PP 4050) or up to 50 (PP 4050XP/4650) separate printer configuration settings called Profiles. One profile should be used for one specific application. This application may require a special setting for the paper format, the paper path, fuser temperature, etc.

In an system environment where the application can not use a driver to select the application specific parameters a profile can be selected by means of a specific PJI command which has to be sent to the printer before sending the print data.

Example:

```
ESC%-12345X@PJI DEFAULT PROFILE = 5
ESC%-12345X
```

A-1.2 Paper Size Select

The printer supports paper format A4, Letter and CUSTOM.

With paper format CUSTOM the page size can be set by PJI commands. These PJI commands have to be sent to the printer before sending the print data.

In the following example (with PJI SET) the paper format selection is only valid for one PCL application file. After a power off or PJI reset the USER DEFAULT environment variables are valid:

```
ESC%-12345X@PJI SET PAPER = CUSTOM
@PJI SET PAGELENGTH = 11 1/3
@PJI SET IMAGEWIDTH = 7.15
@PJI ENTER LANGUAGE = PCL
ESCE.....PCL application file.....ESCE
```

A-1.3 Paper Path Control

The paper path for the printer can be controlled by software. This can be done either by PJL or by PCL commands which have to be sent at the beginning of an application file.

Note: The acceptance of PJL or PCL commands to select the paper format and paper path depends on the configuration of **PAPER SELECTION** and **PAPER PATH SELECT**.

A-1.4 Semigraphics Support under SAP R/3

To increase the printer performance when the printer is running under SAP R/3 PSi provides a printer specific SAP R/3 device type. These device type makes use of the special semigraphic line draw elements. (see chapter **A-4 Support of Semigraphics for SAP/R3**)

The SAP R/3 device type ZPSI4050.PRI including installation description can be downloaded from the PSi homepage: www.psi-si.de

A-1.5 EURO Symbol Support

The printer supports printing of the EURO symbol as printer resident character within the following code tables (see also **Appendix B**):

- ISO 8859 / 15 LATIN 9
- PC - 858 Multilingual
- SYMBOL
- WINDINGS

Note: The EURO symbol is supported in combination with a restricted number of printer typefaces.

A-1.6 Support of Logical Pages and Physical Pages

One Physical Page can be split up into a number of Logical Pages by the parameter **LENGTHFACTOR**.

The page length must be configured or programmed according to the physical length of one page to ensure proper function of the attached stacker. Up to 20 logical pages can be placed on one physical page. The length limit for an attached stacker iPS 4050/4060 (minimum page length is 7 inch) is only valid for the physical page length. Two Logical Pages of 6 inch can be printed on physical paper with 12 inch length by setting LENGTHFACTOR = 2.

The following example shows the PJL commands for an application with image width = 8.5 inch and a logical page length of 3 inch to be printed on a physical page length of 12 inch:

```
ESC%-12345X@PJL SET PAPER = CUSTOM
@PJL SET IMAGEWIDTH = 8.5
@PJL SET PAGELENGTH = 12
@PJL SET LENGTHFACTOR = 4
@PJL ENTER LANGUAGE = PCL
ESC E....PCL file page 1....FF....page 2....FF
....page3....FF ESC E....
```

Note: PJL or PCL commands which are related to the physical page like paper source, number of copies, and cut force a feeding of the paper to the top of the next physical page.

These settings are valid until a PJL RESET condition. (PJL SET command)

A-1.7 Support of Job Separation

Every print job can be separated by a cut operation at the end of the print job. If the parameter **JOBSEPARATION = ON** is set either by configuration or by PJL command every PJL EOJ command triggers a cut operation. The following example shows how to program the automatic separation of two PCL jobs by setting the parameter JOBSEPARATION to ON and using the PJL JOB and PJL EOJ commands at the beginning and end of every PCL job:

```
ESC%-12345X@PJL DEFAULT JOBSEPARATION = ON

ESC%-12345X@PJL JOB
@PJL ENTER LANGUAGE = PCL
ESC E.....PCL job 1.....ESC E
ESC%-12345X@PJL EOJ

ESC%-12345X@PJL JOB
@PJL ENTER LANGUAGE = PCL
ESC E.....PCL job 2.....ESC E
ESC%-12345X@PJL EOJ
```

A-1.8 Conventions

The following conventions are used in the command listings:

ESC	Escape (1/B), introduces an escape sequence
@	Introduce a PJL command
P1	Numeric parameter, or number of units that specify a distance or quantity pertaining to the escape sequence, control function or control string. Accepted values are 0...9999. If the parameter is in normal notation like "200" the programming in hex-code is according to a ASCII table. ("200" = 32,30,30 in hex).
␣ or <SP>	Spaces may appear between characters in sequence for clarity; they are not part of the format. A Space character (hex 20) is indicated by the grafik symbol ␣ or by <SP>.
<CR>	Carriage Return (hex 0D)
<LF>	Line Feed (hex 0A)

A-2 List of Supported PJJ Control Functions

The Fanfold Laser Printer provides limited support of Printer Job Language (PJJ). PJJ topics which are described in this chapter are:

Basic Rules for PJJ Programming

- PJJ Environments
- List of supported PJJ Commands
- List of supported PJJ Variables and Values
- List of supported PJJ Variables and Values for PCL Personality

For more information on topics covered in this section, please refer to the Printer Job Language Technical Reference Manual from Hewlett-Packard, Inc.

A-2.1 Basic Rules for PJJ Programming

Printer Job Language (PJJ) command sequences are used to define all specific parameters for one print job. PJJ commands provide the following major functions:

- Printer language switching between jobs
- Job separation
- Printer configuration
- Status readback from the printer to the host

At the beginning of every print job the UEL command (ESC % - 1 2 3 4 5 X) is used to switch from the print emulation (PCL, Postscript, HEXDUMP...) to the PJJ command level.

A-2.1.1 PJJ Syntax Rules

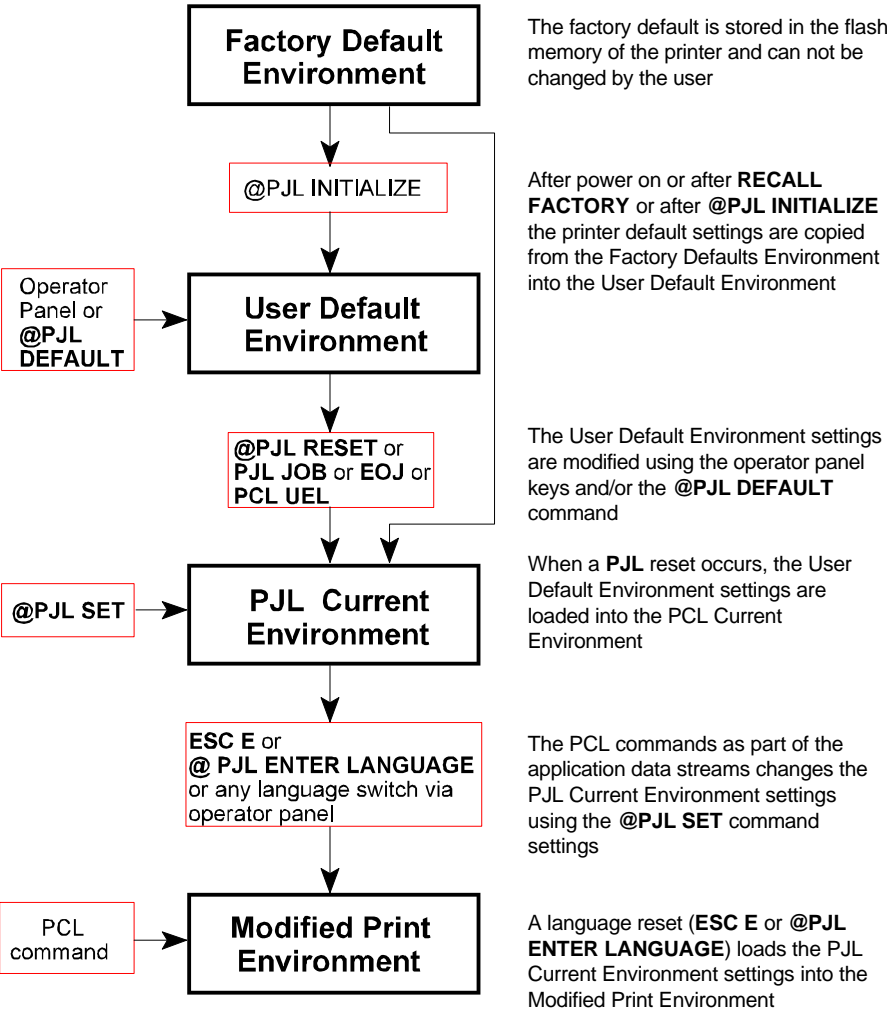
- Use only uppercase characters
- All parts of a PJJ command line must be separated by a <SP> (Space)
- Every PJJ command line must start with the prefix @PJJ.
- Every PJJ command line must end with <LF> (Line Feed)

Sample of typical PJJ command line:

@PJJ <SP>DEFAULT<SP> LPARM : PCL <SP> PTSIZE = 12<LF>
PREFIX <SP> COMMAND <SP> Com. Modifier : Value <SP> Variable = Value<LF>

Note: The first PJJ command after the UEL must start with @PJJ....! (no <SP>)

A-2.1.2 PJJ Environments



A-2.1.3 List of Supported PJJ Commands

PJJ COMMAND	Description
@PJJ COMMENT ["text"]	The COMMENT command is used for adding a line of information or a comment within a set of PJJ commands.
@PJJ JOB [NAME= "text"] [START= #] [END = #]	Defines the name and pages of a PCL print job. NAME = file name (ASCII text) START = first page, range 1 to 214783647 END = last page, range 1 to 214783647
@PJJ EOJ [NAME="job name"]	The EOJ command marks the end of the job which was started with the previous JOB command. It resets the PJJ Current Environment to the User Default Environment. The JOB and EOJ commands should always be used in pairs. Do not use one without the other.
@PJJ ENTER LANGUAGE = personality	Supported personality options are PCL , HEXDUMP
@PJJ RESET	The RESET command resets the PJJ Current Environment variables to their User Default Environment values (see Figure on page before for a description of PJJ Environments).
@PJJ INITIALIZE	The INITIALIZE command resets the PJJ Current Environment and the User Default Environment variables to their Factory Default Environment values.
@PJJ DEFAULT [LPARM : personality] Variable = value	The DEFAULT command sets the User Default Environment value for a specified variable. Personality : PCL, HEXDUMP For supported variables and values see table: A-2.1.4 PJJ Variables and Values

PJJ COMMAND (cont.)	Description
@PJJ SET [LPARM : personality] Variable = value	The SET command allows the user to change the value of PJJ Current variables for the length of a PJJ job, or until a PJJ reset condition returns the value to its default. Personality : PCL, HEXDUMP For supported variables and values see table: A-2.1.4 PJJ Variables and Values
@PJJ RDYMSG ["text of message"]	Displays a message in the 1 st line of the printer's operator panel The message length is at max. 16 characters The printer remains online
@PJJ RDYMSG [""]	Clear the message on the printer's operator panel
@PJJ OPMSG ["text of message"]	Displays the message in the 1 st line of the printer's operator panel The message length is at max. 16 characters The printer gets off line After prompting of this status by pushing the offline/online button, the printer goes ONLINE again
@PJJ INQUIRE [LPARM : personality] Variable	Requests the current value for an environment variable. personality = PCL, HEXDUMP port = For supported variables and values see table: PJJ Variables and Values
@PJJ DINQUIRE [LPARM : personality] Variable	Requests the default value for an environment variable. personality = PCL, HEXDUMP port = For supported variables and values see table: PJJ Variables and Values

PJL COMMAND (cont.)	Description
@PJL INFO category	Requests specified category of printer information. Supported categories are: ID : Printer ID is PP4050 CONFIG : Printer configuration MEMORY : Printer memory STATUS : Printer status VARIABLES : List of Environment variables USTATUS : List of USTATUS variables PROFILES : List of PROFILES
@PJL ECHO [words]	Returns the "words" to the host computer.
@PJL USTATUS variable = value	Allows the printer to send unsolicited status messages. Supported variables and values are: DEVICE = ON : send after status change DEVICE = VERBOSE : same as ON + PJL errors DEVICE = OFF : no status change messages JOB = ON : send at job start / end JOB = OFF : no job start/end message PAGE = ON : send at page end PAGE = OFF : no page end message TIMED = 5...300, 0 : send status after time
@PJL USTATUSOFF	Turns off all unsolicited status messages

A-2.1.4 List of Supported PJL Variables and Values

The following variables can be programmed by the PJL commands:

- **@PJL SET** "variable" = "value"
- **@PJL DEFAULT** "variable" = "value"

PJL VARIABLE	VALUES
PROFILE	1, 2, 3,, 10
PAPER	A4, LETTER, CUSTOM
PAGELENGTH	3, 3 1/6,, 24 in steps of 1 / 6 or 1 / 4 inch Note: value 3 1/6 programming is 3<SP>1/6
LENGTHFACTOR	1, 2, 3,, 20
IMAGEWIDTH	0.5, 0.55,, 16 in steps of 0.05 inch
PAPERSOURCE	LOWER, UPPER
PAPERDESTINATION	BOTTOM, TOP, BOTTOMCUT
ORIENTATION	PORTRAIT, LANDSCAPE
LANDSCAPEMODE	REVERSE, PCLCOMPATIBLE
ORIENTATIONMODE	FIXED, AUTOMATIC
PAPEREXTENDED	NO, YES

PJL VARIABLE (cont.)	VALUES
PAPERSELECT	RECOGNIZE, ONLYPJL, IGNORE
PATHSELECT	RECOGNIZE, IGNORE
FUSERTEMP	LOW, MIDDLE, HIGH
DENSITY (MICR only PP 4050 MICR)	LOW, MIDDLE, HIGH, ECOTOP; MICRLOW, MICRMIDDLE, MICRHIGH
VERSHIFT	-50, -49,, -1, 0, 1, 2,, 50
HORSHIFT	-50, -49,, -1, 0, 1, 2,, 50
CUTSHIFT	-50, -49,, -1, 0, 1, 2,, 50
PERSONALITY	PCL, HEXDUMP
AUTOFORMFEED	OFF, 1, 2,, 120
AUTOFORMCUT	OFF, 1, 2,, 120
TRACTORPOOL	ON, OFF
JOBSEPARATION	ON, OFF
TRACTORCHANGECUT	ON; OFF
REPRINTLASTPAGE	ON, OFF

Note: All parameter which can be programmed with PJL Variables can also be configured by the Operator Panel of the printer.
For detailed description of parameters see chapter **4 Explanation of Individual Menu Items**

The following variables can be programmed by the PJL command:

– **@PJL DEFAULT** "variable" = "value"

PJL VARIABLE	VALUES
POWERSAVE	OFF, 15, 30, 45, 60
KEEPTEMPHIGH	ALWAYS, 0.5, 1,, 60 (in steps of 0.5 sec)
ALARMBELL	ON, OFF <i>Note:</i> only valid with panel version 0.26
LANG	ENGLISH, GERMAN, FRENCH, SPANISH
MENUACCESS	ALL, PROFILESONLY, NONE

Note: These variables can not be used by the PJL COMMAND SET.
For detailed description of parameters see Chapter **4 Explanation of Individual Menu Items**

A-2.1.5 List of Supported PJJ Variables and Values for PCL Personality

The following variables can be programmed by the PJJ commands:

- @PJJ SET LPARM : PCL "variable" = "value"
- @PJJ DEFAULT LPARM : PCL "variable" = "value"

PJJ VARIABLE	VALUES
FONTNUMBER	1, 2, 3,, 54
PITCH	0.44,, 99.99 (in steps of 0.01)
PTSIZE	4.00, 4.25,, 99.75 (in steps of 0.25)
SYMSET	ROMAN8, ISOL1, ISOL2, ISOL5, ISOL9, PC8, PC8DN, PC850, PC852, PC858, PC8TK, WINL1, WINL2, WINL5, DESKTOP, PSTEXT, VNINTL, VNUS, MSPUBL, MATH8, PSMATH, VNMATH, PIFONT, LEGAL, ISO4, ISO6, ISO11, ISO15, ISO17, ISO21, ISO60, ISO69, WIN30
LINESPACING	1, 2, 3,, 48
TOPMARGIN	0, 1, 2,, 999
LEFTMARGIN	0, 1, 2,, 999
RIGHTMARGIN	0, 1, 2,, 999, MAXIMUM
TEXTLENGTH	0, 1, 2,, 999
PERFORATIONSKIP	OFF, ON
DOLLARCOMMANDS	OFF, ON

Note: All parameter which can be programmed with PJJ Variables can also be configured by the Operator Panel of the printer.
For detailed description of parameters see Chapter 4 **Explanation of Individual Menu Items**

A-3 List of Supported PCL5 Control Functions

A-3.1 Job Control Commands

JOB CONTROL COMMANDS	Description
ESC % - 12345 X	Universal Exit / Start of PJJ Change to PJJ Language Interpretation Mode Reset the printer like performing a Reset command Print all data received before the UEL command
ESC E	Reset Reset to PJJ Current Environment Printing of any partial pages Deleting of all temporary download resources, as macros, fonts, and patterns
ESC & ℓ # X	Number of Copies Number of printed copies for each page
ESC & ℓ # U	Left Offset Registration Position of the logical page across the width of the physical page
ESC & ℓ # Z	Top Offset Registration Position of the logical page along length of the physical page
ESC & u # D	Unit of Measure Measure for PCL unit cursor movements
ESC & ℓ # G (Private Command)	Paper Exit Selection Parameters: # = 1 : Upper exit, each page is cut # = 2 : Lower exit (Stacker) without cutting # = 12 : Lower exit, each page is cut

A-3.2 Page Control Commands

PAGE CONTROL COMMANDS	Description
ESC & ℓ # A (Private Command)	Page Size Definition of the paper size and in turn of the logical page size. Parameters: # = 2 : Letter # = 26 : A4 # = 101 : Custom
ESC & ℓ # O	Orientation Different rotations of the logical page # = 0 : Portrait # = 1 : Landscape # = 2 : Reverse Portrait # = 3 : Reverse Landscape
ESC & ℓ # H (Private Command)	Paper Source Designation of the location for paper feeding or printing of the current page Parameters: # = 0 : Print the current page # = 1 : Paper Feeding from the Upper Tractor # = 4 : Paper Feeding from the Lower Tractor
ESC & a # P	Print Direction Rotation of the page coordinate system related to the current position in steps of 90°
ESC & a # L	Left Margin Setting to the left edge of the page (columns)
ESC & a # M	Right Margin Setting to the right edge of the page (columns)

PAGE CONTROL COMMANDS (cont.)	Description
ESC 9	Clear Horizontal Margins Resetting of the right and left margin
ESC & ℓ # E	Top Margin Setting the top of the text area in lines
ESC & ℓ # F	Text Length Number of printing lines per page Setting of the bottom margin
ESC & ℓ # L	Perforation Skip # = 0 : Disable # = 1 : Enable
ESC & k # H	Horizontal Motion Index Width of the columns where # (x 1/120 inch)
ESC & ℓ # C	Vertical Motion Index Height of rows where # (x 1/48 inch)
ESC & ℓ # D	Line Spacing Number of lines printed per inch # = 1, 2, 3,, 48

A-3.3 Cursor Positioning Commands

CURSOR POSITIONING COMMANDS	Description
ESC & a # C	Horizontal Position in Columns
ESC * p # X	Horizontal Position in PCL Units
ESC & a # H	Horizontal Position in Decipoints
ESC & a # R	Vertical Position in Rows
ESC * p # Y	Vertical Position in PCL Units
ESC & a # V	Vertical Position in Decipoints
ESC =	Half Line Feed
ESC & k # G	Line Termination
ESC & f # S	Push / Pop Cursor Position

CURSOR POSITIONING COMMANDS (cont.)	Description
ESC & k # G	Line Termination # = 0 : CR = CR, LF = LF, FF = FF # = 1 : CR = CR+LF, LF = LF, FF = FF # = 2 : CR = CR, LF = CR+LF, FF = CR+FF # = 3 : CR = CR+LF, LF = CR+LF, FF = CR+FF
ESC & f # S	Push / Pop Cursor Position # = 0 : Push (Store) # = 0 : Pop (Recall)
ESC & s # C	End-Of- Line Wrap # = 0 : Enable # = 1 : Disable
CR (hex 0D)	Carriage Return
SP (hex 20)	Space
BS (hex 08)	Backspace
HT (hex 09)	Horizontal Tab
LF (hex 0A)	Line Feed
FF (hex 0C)	Form Feed

A-3.4 Font Selection Commands

FONT SELECTION COMMANDS	Description
ESC (<i>ID</i>	Symbol Set , primary *) <i>ID</i> = Code for Symbol Set, see Chapter 4 Explanation of Individual Items and here point SYMBOL SETS or a Printout of PCL TYPEFACE LIST
ESC (s # P	Spacing, primary *) # = 0 : Fixed Spacing # = 1 : Proportional Spacing
ESC (s # H	Pitch, primary *) # = Number of character per inch
ESC (s # V	Height, primary *) # = Character height in point
ESC (s # S	Style, primary *) # = 0 : Upright # = 1 : Italic
ESC (s # B	Stroke Weight, primary *) # = 0 : Medium # = 3 : Bold
ESC (s # T	Typeface, primary *) # = Code number for Typeface, see Printout of PCL TYPEFACE LIST
ESC (s # X	Font Selection by ID #, primary *)
ESC (3 @	Select Default Font as primary *)

*) All commands for primary with ?(?) parenthesis can be used for secondary with ?)? parenthesis

A-3.5 Font Management Commands

FONT MANAGEMENT COMMANDS	Description
ESC & d # D	Enable Underline # = 0 : Fixed position # = 3 : Floating position
ESC & d @	Disable Underline
ESC & p # X [data]	Transparent Print Data
ESC * c # D	Assign Font ID #
ESC * c # F	Font Control
ESC * c # R	User Defined Symbol Set ID Code
ESC (f # W [data]	User Defined Symbol Set Data
ESC * c # S	User Defined Symbol Set Control
ESC) s # W [data]	Soft Font Descriptor
ESC * c # E	Soft Font Character Code
ESC (s # W [data]	Soft Font Download Character
ESC Y	Display Functions Mode On
ESC Z	Display Functions Mode Off

Note: For detailed informations see HP PCL 5 Technical Reference Manual.

A-3.6 Macro Control Commands

MACRO CONTROL COMMANDS	Description
ESC & f # Y	Macro ID
ESC & f # X	Macro Control # = 0 : Start macro definition (last ID specified) # = 1 : Stop macro definition # = 2 : Execute macro (last ID specified) # = 3 : Call macro (last ID specified) # = 4 : Enable macro for automatic overlay (last ID specified) # = 5 : Disable automatic overlay # = 6 : Delete all macros # = 7 : Delete all temporary macros # = 8 : Delete macro (last ID specified) # = 9 : Make macro temporary (last ID specified) # = 10 : Make macro permanent (last ID specified)

Note: For detailed informations see HP PCL 5 Technical Reference Manual.

A-3.7 Graphic Commands

GRAPHIC COMMANDS	Description
ESC * v # N	Source Transparency Mode
ESC * v # O	Pattern Transparency Mode
ESC * c # G	Area Fill ID
ESC * v # T	Select Current Pattern
ESC * c # W [data]	Define User Defined Pattern
ESC * p # R	Set Pattern Reference Point
ESC * c # Q	User Defined Pattern Control
ESC * t # R	Raster Graphic Resolution
ESC * r # F	Raster Graphic Presentation
ESC * r # T	Raster Graphic Height
ESC * r # S	Raster Graphic Width
ESC * r # A	Start Raster Graphics
ESC * b # Y	Raster Graphic Y Offset
ESC * b # M	Raster Graphic Compression Mode
ESC * b # W [data]	Transfer Raster Graphic Data
ESC * B or ESC * C	End of Raster Graphic
ESC * c # A	Horizontal Rectangle Size, PCL Units
ESC * c # H	Horizontal Rectangle Size, Decipoint
ESC * c # B	Vertical Rectangle Size, PCL Units
ESC * c # V	Vertical Rectangle Size, Decipoints
ESC * c # G	Pattern ID for Area Fill
ESC * c # P	Fill Rectangle Area
ESC * c # X	HPGL Horizontal Picture Frame Size
ESC * c # Y	HPGL Vertical Picture Frame Size
ESC * c 0 T	HPGL Picture Frame Anchor Point
ESC * c # K	HPGL Horizontal Plot Size
ESC * c # L	HPGL Vertical Plot Size
ESC % # B	Enter HPGL Mode
ESC % # A	Return from HPGL to PCL Mode

Note: For detailed informations see HP PCL 5 Technical Reference Manual.

A-3.8 Status Readback Commands

STATUS READBACK COMMANDS	Description
ESC * s # T	Set Status Readback Location Type
ESC * s # U	Set Status Readback Location Unit
ESC * s # I	Set Status Readback Entity
ESC * s 1 M	Free Space
ESC & r # F	Flush all pages
ESC * s # X	Echo

Note: For detailed informations see HP PCL 5 Technical Reference Manual.

A-4 Support of Semigraphics for SAP/R3

Semigraphical Symbols in Symbol Set ISO 8859/1 and PC-8

The symbol set ISO 8859/1 and PC-8 contain 11 semigraphical symbols to optimally support line drawing functions in SAP/R3 applications:

Position in ISO 8859/1	Character PC-8	Position in PC-8
9/0		C/5
9/1		C/4
9/2		B/3
9/3		D/A
9/4		B/F
9/5		C/0
9/6		D/0
9/7		C/3
9/8		B/4
9/9		C/2
9/A		C/1

The symbols are selected from the symbol set table with the specified typeface 4099 (courier) with fix spacing and pitch, default style and default stroke weight.

ESC (ON (s0p16 . 67h0s0b4099T

A-5 Bar Code Programming

A-5.1 Resident Bar Code Font Code 39 HP Compatible

The bar code Code 39 is integrated as two bitmapped fonts into the Operating System for the printer as resident printer font. This bitmapped fonts can be used compatible to the cartridge implementation from Hewlett Packard **Bar Code & More** for HP laser printers.

The printer resident bar code font Code39 can be selected either from the operator panel of the printer as internal font number 52 and 53 (for programming detail see **PCL Typeface List**) or by PCL command with the following parameters:

- symbol set **0Y** pitch **8.17** typeface **0** (line printer) or
- symbol set **0Y** pitch **4.71** typeface **0** (line printer)
-

The printer offers variety set of resident Bar codes which can be addressed by means of additional PCL 5 control sequences.

This HP bar code fonts can be used like any other bitmapped font in the PCL5 emulation. Position and rotation is possible by PCL5 commands.

Note: Horizontal scalling is only possible to the values **8.17** or **4.71** CPI.
Vertical enlargement is possible by printing more lines.

Print sample:



Code 3of9



Code 3of9

A-5.2 Resident Bar Codes Controlled by Private Command Sequences

Introduction Bar codes are programmed in three subsequent steps:

1. Select a bar code type and define the bar code specific parameter set of
 - height
 - module width
 - ratio of bars to spaces
 - text control
2. Define bar code print position and print orientation
3. Print the bar code by sending the bar code data command

Note: For every bar code an individual set of parameters (height, module width, ratio, text control) can be programmed. The default values (see table on page A-29) of these parameters are activated with the first selection of a bar code type.

Programming a new parameter modifies only the value of the actually selected bar code type. The value is applied until it is overwritten by a new value or the printer is switched off. (Bar code parameters are not stored in the printer environment !)

– **The Resident Bar Codes are:**

Code 39,
2 of 5 industrial,
2 of 5 interleaved,
EAN 8 SC2, EAN 8 SC6, EAN 8 SC9,
EAN 13 SC2, EAN 13 SC6, EAN 13 SC9,
UPC-A SC2, UPC-A SC6, UPC-A SC9,
UPC-E SC2, UPC-E SC6, UPC-E SC9,
Codabar,
MSI,
Code 93,
Postnet,
Code 128, and
RM4SCC/KIX.

A-5.2.1 Programming

Programming of the resident bar codes is achieved by means of six new control sequences added to the PCL5 emulation.

The print position and print orientation of a bar code is controlled by standard PCL5 commands.

– Bar code print position

Printing of any bar code starts at the current actual cursor position. The position can be set with any standard PCL5 cursor movement command. Moving the cursor with printed characters, spaces and carriage return and line feed is the simplest possibility.

Setting the cursor to an absolute or relative position in PCL units is the best way to position a bar code:

ESC * p P1 X	absolute horizontal position to P1
ESC * p + P1 X	relative horizontal position P1 to the left
ESC * p - P1 X	relative horizontal position P1 to the right
ESC * p P1 Y	absolute vertical position to P1
ESC * p + P1 Y	relative vertical position P1 down
ESC * p - P1 Y	relative vertical position P1 up

- Note:**
- The bar code **REFERENCE POSITION** is the left upper edge except for Postnet where the reference position is the character baseline.
 - The **cursor position is not changed** after printing the bar code. The cursor must be set to a new position for the next printable character.
 - One PCL unit is the unit of measure for cursor movements. The default value is 300 units per inch.

– Bar code print orientation

Bar codes are printable in all four print directions, selectable with the following PCL5 command:

ESC & a P1 P P1 = 0, 90, 180, 270 default = 0°

– Bar code type

This command selects a bar code type:

ESC * z P1 V	default = 0
P1 = 0	Code 39
P1 = 1	2 of 5 industrial
P1 = 2	reserved
P1 = 3	reserved
P1 = 4	2 of 5 interleaved
P1 = 102	EAN 8 SC2
P1 = 106	EAN 8 SC6
P1 = 109	EAN 8 SC9
P1 = 122	EAN 13 SC2
P1 = 126	EAN 13 SC6
P1 = 129	EAN 13 SC9
P1 = 142	UPC-A SC2
P1 = 146	UPC-A SC6
P1 = 149	UPC-A SC9
P1 = 162	UPC-E SC2
P1 = 166	UPC-E SC6
P1 = 169	UPC-E SC9
P1 = 180	Codabar
P1 = 181	MSI
P1 = 188	Code 93
P1 = 200	Postnet
P1 = 210	Code 128
P1 = 220	RM4SCC/KIX

- Note:** EAN and UPC code selection supports ADD2 and ADD5 extensions by sending those additional digits.

– Bar code height

This command defines the height of the actual selected bar code:

ESC * z P1 H P1 = height in PCL units

For every bar code type an individual value is stored. The default height value for bar code is 0.5 inch (P1 = 150) except EAN, UPC and Postnet.

The default height for EAN and UPC is defined with the scaling factor SC 2, 6 or 9. The height of Postnet is fixed.

Bar code height values are selectable in the range from 0.01 inch (P1 = 3) to 10 inch (P1 = 3000).

Note: One PCL unit is the PCL scaling unit. Default is 300 units per inch.

– Bar code data

This command specifies the bar code data field. Two command formats are supported. The first format is conforming to earlier PCL3 commands and does not report the number of data bytes in front of the data field:

ESC * z < data > Z data = bar code data field

The bar code data are enclosed in the two brackets. If the right bracket itself is part of the data field it has to be sent twice.

The second format is according to typical PCL5 commands. The number of bytes in the data field is indicated before sending the data:

ESC * z P1 Z data P1 = number of bytes in the bar code field data

Note: The number of bar code data bytes must correspond to the selected bar code type, otherwise the command is ignored.

– Bar code text control

This command controls the optional printing of bar code data as an added text string.

ESC * z P1 Q

P1 = 0	disable text
P1 = 1	text above bar code with OCR-B font
P1 = 2	text below bar code with OCR-B font (default)
P1 = 3	text above bar code with actual selected font
P1 = 4	text below bar code with actual selected font

The text string is centred to the printed bar code.

Note: – For EAN code with OCR-B font the pitch is not 10 CPI.

- For actual fonts the vertical distance between bar code and text is equal to the maximum bar width. The programmer has to ensure that the actual selected font is adequate to be printed in combination with the bar code.

– Bar code module width

Horizontal scaling of the bar code is selectable by the module width.

This parameter defines the width of the narrow bar in PCL units.

ESC * z P1 S P1 = module width in PCL units

Value range is from 1 to 32,767. The default values for the different bar code are described in the table on the next page.

Note: For bar code types EAN and UPC the predefined values given with the scaling factor (see table) must not be modified.
For Postnet and KIX code the module width is fixed.

– Bar code ratio

This command selects one of the available ratios between wide and narrow bars (spaces).

ESC * z P1 O P1 = 2.0 ; 2.5 ; 3.0 ; default is 2.5

Note: This command is not applicable to all bar codes; refer to table below.

Default values for module width and ratio:

Bar code code No. type		Module width		Ratio	
		default ¹⁾	variable	default	variable
0	Code 39	6	yes	2.5	yes
1	2 of 5 industrial	6	yes	2.5	yes
4	2 of 5 interleaved	6	yes	2.5	yes
102	EAN 8 SC 2	4	yes *)	fixed	no
106	EAN 8 SC 6	6	yes *)	fixed	no
109	EAN 8 SC 9	8	yes *)	fixed	no
122	EAN 13 SC 2	4	yes *)	fixed	no
126	EAN 13 SC 6	6	yes *)	fixed	no
129	EAN 13 SC 9	8	yes *)	fixed	no
142	UPC - A SC 2	4	yes *)	fixed	no
146	UPC - A SC 6	6	yes *)	fixed	no
149	UPC - A SC 9	8	yes *)	fixed	no
162	UPC - E SC 2	4	yes *)	fixed	no
166	UPC - E SC 6	6	yes *)	fixed	no
169	UPC - E SC 9	8	yes *)	fixed	no
180	Codabar	6	yes	2.5	yes
181	MSI	6	yes	2.5	yes
188	Code 93	6	yes	fixed	no
200	Postnet	fixed	no	fixed	no
210	Code 128	6	no	fixed	no
220	RM4SCC/KIX	fixed	no	fixed	no

¹⁾ in $\frac{1}{300}$ inch

*) for optimum readability module width should not be changed

– Start and Stop characters

For bar code types EAN, UPC, Code 93, Code 128 and Postnet the printer automatically adds start and stop characters.

For bar code type Code 39, 2 of 5 industrial and 2 of 5 interleaved the printer adds start and stop characters only if they are not generated by the system.

For bar code type Codabar the application has to generate the start and stop characters.

Following start and stop characters are accepted by the printer:

Bar code Type	Start Character	Stop Character
Code 39	*	*
2 of 5 types	:	;
Codabar	a, b, c, d, A, B, C, D	t, n, *, e, A, B, C, D

Note: Following combinations (start / stop) are specified for Codabar, but not checked by the printer:

(a / t) (b / n) (c / *) (d / e) (A / A) (B / B) (C / C) (D / D)

– Error checking characters

Error checking characters are added by the printer only for bar code types Code 128, Code 93 and Postnet. For all other bar code types the application has to generate error checking characters and transmit them to the printer.

– Unprinted areas

To ensure proper readability of a bar code unprinted areas in front and behind the bar code are required. The printer does not insert these areas itself; the amount of space has to be calculated by the application.

A-5.3 Bar Code Programming Examples

– Example for Code 39

type = Code 39: ESC * z 0 V
 Height = 0.6 inch ESC * z 180 H
 text = OCR-B above ESC * z 1 Q
 data = CODE 39 ESC * z < CODE 39 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	30	56	1B	2A	7A	31	38	30	48	1B	2A	7A	31
51	1B	2A	7A	3C	43	4F	44	45	33	39	3E	5A			



– Example for 2 of 5 industrial

type = 2 of 5 industrial: ESC * z 1 V
 Height = 0.6 inch ESC * z 180 H
 mod. width = 10 PCL units ESC * z 10 S
 text = OFF ESC * z 0 Q
 data = 1 2 3 ESC * z < 1 2 3 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	31	56	1B	2A	7A	31	38	30	48	1B	2A	7A	31
30	53	1B	2A	7A	30	51	1B	2A	7A	3C	31	32	33	3E	5A

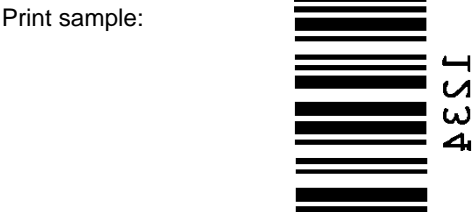


– Example for 2 of 5 interleaved

type = 2 of 5 interleave: ESC * z 4 V
 position = X=500; Y=500 ESC * p 5 0 0 x 5 0 0 Y
 orientation = 90° ESC & a 9 0 P
 text = actual font below ESC * z 4 Q
 data = 1 2 3 4 ESC * z < 1 2 3 4 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	34	56	1B	2A	70	35	30	30	78	35	30	30	59
1B	26	61	39	30	50	1B	2A	7A	34	51	1B	2A	7A	3C	31
32	33	34	3E	5A											



– Example for EAN 8 SC2

type = EAN 8 SC2: ESC * z 1 0 2 V
 orientation = 270° ESC & a 2 7 0 P
 text = OCR-B below ESC * z 2 Q
 data = 4 0 1 2 3 4 5 5 ESC * z 8 Z 4 0 1 2 3 4 5 5

The HEXDUMP datastream for this example is:

1B	2A	7A	31	30	32	56	1B	26	61	32	37	30	50	1B	2A
7A	32	51	1B	2A	7A	38	5A	34	30	31	32	33	34	35	35



– Example for EAN 8 SC6 add 2

type

orientation

text

data

=EAN 8 SC6

= 270°

= actual font below

= 4 0 1 2 3 4 5 5 1 2

ESC * z 1 0 6 V

ESC & a 2 7 0 P

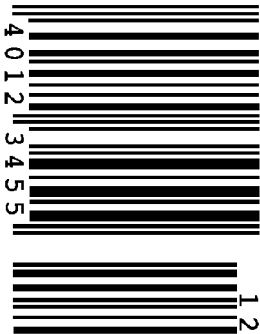
ESC * z 4 Q

ESC * z 1 0 Z 4 0 1 2 3 4 5 5 1 2

The HEXDUMP datastream for this example is:

1B	2A	7A	31	30	36	56	1B	26	61	32	37	30	50	1B	2A
7A	34	51	1B	2A	7A	31	30	5A	34	30	31	32	33	34	35
35	31	32													

Print sample:



– Example for EAN 8 SC9 add 5

type

text

data

= EAN 8 SC9:

= OCR-B above

= 4 0 1 2 3 4 5 5 8 6 1 0 4

ESC * z 1 0 9 V

ESC * z 1 Q

ESC * z 1 3 Z 4 0 1 2 3 4 5 5 8 6 1 0 4

The HEXDUMP datastream for this example is:

1B	2A	7A	31	30	39	56	1B	2A	7A	31	51	1B	2A	7A	31
33	5A	34	30	31	32	33	34	35	35	38	36	31	30	34	

Print sample:



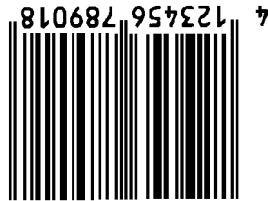
– Example for EAN 13 SC2

type =EAN 13 SC2: ESC * z 1 2 2 V
 orient. = 180° ESC & a 1 8 0 P
 text = OCR-B below ESC * z 2 Q
 data = 4 1 2 3 4 5 6 7 8 9 0 1 8 ESC * z 1 3 Z 4 1 2 3 4 5 6 7 8 9 0 1 8

The HEXDUMP datastream for this example is:

1B	2A	7A	31	32	32	56	1B	26	61	31	38	30	50	1B	2A
7A	32	51	1B	2A	7A	31	33	5A	34	31	32	33	34	35	36
37	38	39	30	31	38										

Print sample:



– Example for Codabar

type = Codabar ESC * z 1 8 0 V
 ratio = 3.0 ESC * z 3 . 0 O
 text = OCR-B below ESC * z 2 Q
 data = a 0 1 2 3 4 5 6 7 8 9 t ESC * z 1 2 Z a 0 1 2 3 4 5 6 7 8 9 t

The HEXDUMP datastream for this example is:

1B	2A	7A	31	38	30	56	1B	2A	7A	33	2E	30	4F	1B	2A
7A	32	51	1B	2A	7A	31	32	5A	61	30	31	32	33	34	35
36	37	38	39	74											

Print sample:



– Example for Code 128

act. font = Ribbon SWC 20 Pt ESC (s 1 p 2 0 v 1 s 0 b 4 1 1 6 T
 type = Code 128: ESC * z 2 1 0 V
 orient. = 90° ESC & a 9 0 P
 text = actual font below ESC * z 4 Q
 data = C o d e 1 2 8 ESC * z < C o d e 1 2 8 > Z

The HEXDUMP datastream for this example is:

1B	28	73	31	70	32	30	76	31	73	30	62	34	31	31	36
54	1B	2A	7A	32	31	30	56	1B	26	61	39	30	50	1B	2A
7A	34	51	1B	2A	7A	3C	43	6F	64	65	31	32	38	3E	5A

Print sample:



– Example for POSTNET

type	= POSTNET	ESC * z 2 0 0 V
data	= 123456789	ESC * z < 123456789 > Z
	CR LF LF	0D 0A 0A
	Mark Pollmann CR LF	Mark Pollmann 0D 0A
	101 Main St CR LF	101 Main St 0D 0A
	Anytown US	Anytown US

The HEXDUMP **POSTNET** datastream for this example is:

1B	2A	7A	32	30	30	56	1B	2A	7A	3C	31	32	33	34	35
36	37	38	39	3E	5A										

Print sample: 

Mark Pollmann
101 Main St
Anytown US

– Example for RMS4SCC / KIX

type	= KIX	ESC * z 2 2 0 V
data	= 9 7 2 5 K E 5 6 x 4 3	ESC * z < 9 7 2 5 K E 5 6 x 4 3 > Z

The HEXDUMP datastream for this example is:

1B	2A	7A	32	32	30	56	1B	2A	7A	3C	39	37	32	35	4B
45	35	36	78	34	33	3E	5A								

Print sample:



Appendix B Symbol Sets

– Roman-8 Display: **ROMAN-8** ID Number: **8U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	'	p				ˉ	â	Å	Á	Þ	0
01			!	1	A	Q	a	q			À	Ý	ê	î	Ã	þ	1
02			"	2	B	R	b	r			Â	ý	ô	Ø	ã	·	2
03			#	3	C	S	c	s			È	°	û	Æ	Ð	μ	3
04			\$	4	D	T	d	t			Ê	Ç	á	ã	ð	¶	4
05			%	5	E	U	e	u			Ë	ç	é	í	Í	¾	5
06			&	6	F	V	f	v			Î	Ñ	ó	ø	ì	—	6
07			'	7	G	W	g	w			Ï	ñ	ú	æ	Ó	¼	7
08			(	8	H	X	h	x			´	ı	à	Ä	Ò	½	8
09			)	9	I	Y	i	y			`	ı	è	ì	Õ	ª	9
10			*	:	J	Z	j	z			^	ı	ò	Ö	õ	°	A
11			+	;	K	[	k	{			ˆ	£	ù	Ü	Š	«	B
12			,	<	L	\	l	|			˜	¥	ä	É	š	■	C
13			-	=	M	]	m	}			Ù	§	ë	ï	Ú	»	D
14			.	>	N	^	n	~			Û	f	ö	ß	ÿ	±	E
15			/	?	O	_	o	⌘			£	¢	ü	Ô	ÿ		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO 8859/1 Latin 1 Display: **ISO L1** ID Number: **0N**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p		+		°	À	Ð	à	ð	0
01			!	1	A	Q	a	q		—	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r		|	¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s		ƒ	£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t		Œ	¤	´	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u		Ł	¥	μ	Å	Ö	å	õ	5
06			&	6	F	V	f	v		Ɔ	ı	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w		†	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x		‡	ˆ	˙	È	Ø	è	ø	8
09			)	9	I	Y	i	y		‡	©	¹	É	Ù	é	ù	9
10			*	:	J	Z	j	z		‡	ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|			¼	½	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			¾	⅓	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	¾	Î	Þ	î	þ	E
15			/	?	O	_	o	⌘			˜	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO 8859/2 Latin 2

Display: ISO L2

ID Number: 2N

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	Ř	Đ	ř	đ	0
01			!	1	A	Q	a	q			Ą	ą	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r			˘	˙	Â	Ń	â	ñ	2
03			#	3	C	S	c	s			Ł	ł	Ă	Ó	ă	ó	3
04			\$	4	D	T	d	t			ⱡ	˘	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			Ł	ł	Í	Ó	í	ó	5
06			&	6	F	V	f	v			Š	š	Č	Ö	č	ö	6
07			'	7	G	W	g	w			§	˘	Ç	×	ç	÷	7
08			(	8	H	X	h	x			˘	˙	Č	Ř	č	ř	8
09			)	9	I	Y	i	y			Š	š	É	Ů	é	ů	9
10			*	:	J	Z	j	z			Š	š	Ę	Ú	ę	ú	A
11			+	;	K	[	k	{			Ť	ť	Ě	Ů	ě	ů	B
12			,	<	L	\	l	|			Ž	ž	Ě	Ü	ě	ü	C
13			-	=	M	]	m	}			-	˘	Í	Ý	í	ý	D
14			.	>	N	^	n	˘			Ž	ž	Î	Ť	î	ť	E
15			/	?	O	_	o	⊞			Ž	ž	Ď	ß	ď	˘	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⊞

– ISO 8859/9 Latin 5

Display: ISO L5

ID Number: 5N

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Č	à	č	0
01			!	1	A	Q	a	q			ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r			ç	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t			ⱡ	˘	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			¥	μ	Å	Ö	å	ö	5
06			&	6	F	V	f	v			ı	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w			§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x			˘	˙	È	Ø	è	ø	8
09			)	9	I	Y	i	y			©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	ü	B
12			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	Ý	í	ý	D
14			.	>	N	^	n	˘			®	¾	Î	Ş	î	ş	E
15			/	?	O	_	o	⊞			˘	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⊞

– ISO 8859/15 Latin 9

Display: ISO L9

ID Number: 9N

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ð	à	ð	0
01			!	1	A	Q	a	q			ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r			¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t			€	Ž	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			¥	μ	Å	Õ	å	õ	5
06			&	6	F	V	f	v			Š	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w			§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x			š	ž	È	Ø	è	ø	8
09			)	9	I	Y	i	y			©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|			¬	œ	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	œ	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	ÿ	Î	Þ	î	þ	E
15			/	?	O	_	o				-	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Ne

Note: € sign in position A4 (hex)

– PC-8 Code Page 437

Display: PC-8

ID Number: 10U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⌒	⌒	α	≡	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⋮	⌒	⌒	β	±	1
02	☹	↕	"	2	B	R	b	r	é	Æ	ó	⋮	⌒	⌒	Γ	≥	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⌒	⌒	π	≤	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⌒	⌒	⌒	Σ	∫	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	⌒	⌒	⌒	σ	∫	5
06	♠	—	&	6	F	V	f	v	å	û	ª	⌒	⌒	⌒	μ	÷	6
07	●	↕	'	7	G	W	g	w	ç	ù	º	⌒	⌒	⌒	τ	≈	7
08	■	↑	(	8	H	X	h	x	ê	ÿ	ı	⌒	⌒	⌒	Φ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	⌒	⌒	⌒	⌒	Θ	·	9
10	☉	→	*	:	J	Z	j	z	è	Ü	⌒	⌒	⌒	⌒	Ω	·	A
11	♂	←	+	;	K	[	k	{	ï	¢	½	⌒	⌒	⌒	δ	√	B
12	♀	⌒	,	<	L	\	l	|	î	£	¼	⌒	⌒	⌒	∞	ⁿ	C
13	♫	↔	-	=	M	]	m	}	ì	¥	ı	⌒	⌒	⌒	φ	²	D
14	♫	▲	.	>	N	^	n	˘	Ä	Pt	«	⌒	⌒	⌒	€	▪	E
15	⚙	▼	/	?	O	_	o	△	Å	f	»	⌒	⌒	⌒	∩		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

– PC-8 Danish/Norwegian Display: PC-8 DN

ID Number: 11U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⌞	⌚	α	≡	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⌘	⌞	⌚	β	±	1
02	●	↑	"	2	B	R	b	r	é	Æ	ó	⌘	⌞	⌚	Γ	≥	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⌞	⌚	π	≤	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⌞	⌚	⌚	Σ	∫	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	⌞	⌚	⌚	σ	∫	5
06	♠	–	&	6	F	V	f	v	å	û	õ	⌞	⌚	⌚	μ	÷	6
07	●	↑	'	7	G	W	g	w	ç	ù	Õ	⌞	⌚	⌚	τ	≈	7
08	■	↑	(	8	H	X	h	x	ê	ÿ	ı	⌞	⌚	⌚	Φ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	ã	⌞	⌚	⌚	Θ	·	9
10	⊙	→	*	:	J	Z	j	z	è	Ü	Ã	⌞	⌚	⌚	Ω	·	A
11	♂	←	+	;	K	[	k	{	ï	ø	ℓ	⌞	⌚	⌚	δ	√	B
12	♀	⌞	,	<	L	\	l	|	î	£	ˆ	⌞	⌚	⌚	∞	ˆ	C
13	♫	↔	-	=	M	]	m	}	ì	Ø	ı	⌞	⌚	⌚	φ	²	D
14	♫	▲	.	>	N	^	n	˘	Ä	Ł	³	⌞	⌚	⌚	€	▪	E
15	⊛	▼	/	?	O	_	o	◊	Å	Ł	ˆ	⌞	⌚	⌚	∩		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⊛

– PC-850 Multilingual

Display: PC-850

ID Number: 12U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⌞	ø	Ó	-	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⌘	⌞	Ð	ß	±	1
02	●	↑	"	2	B	R	b	r	é	Æ	ó	⌘	⌞	Ê	Ô	=	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⌞	Ë	Ò	¼	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⌞	⌚	È	õ	¶	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	+	ı	Õ	§	5
06	♠	–	&	6	F	V	f	v	å	û	ª	Â	ã	Í	μ	÷	6
07	●	↑	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	˘	7
08	■	↑	(	8	H	X	h	x	ê	ÿ	ı	⊙	ℒ	İ	Ɔ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	®	≡	℞	⌞	Ú	˘	9
10	⊙	→	*	:	J	Z	j	z	è	Ü	ˆ	||	≡	⌞	Û	˘	A
11	♂	←	+	;	K	[	k	{	ï	ø	½	≡	≡	■	Ù	˘	B
12	♀	⌞	,	<	L	\	l	|	î	£	¼	≡	≡	■	Ý	˘	C
13	♫	↔	-	=	M	]	m	}	ì	Ø	ı	⌞	≡	⌞	Ý	˘	D
14	♫	▲	.	>	N	^	n	˘	Ä	×	«	¥	≡	İ	˘	▪	E
15	⊛	▼	/	?	O	_	o	◊	Å	f	»	⌞	⌘	■	˘		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⊛

– PC-852 Latin 2

Display: PC-852

ID Number: 17U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	Ł	đ	Ó	-	0
01	☺	◄	!	1	A	Q	a	q	ü	Í	í	⌘	±	Đ	ß	ˆ	1
02	●	↕	"	2	B	R	b	r	é	Í	ó	⌘	±	Ď	Ô	ˆ	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	└	Ě	Ň	˘	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	Ą	└	—	d'	ń	˘	4
05	♣	§	%	5	E	U	e	u	û	Ł	ą	Á	+	Ń	ň	§	5
06	♠	—	&	6	F	V	f	v	ć	ł	Ż	Â	Ă	Í	Š	÷	6
07	●	↕	'	7	G	W	g	w	ç	Ś	ż	Ě	ă	Î	ș	,	7
08	■	↑	(	8	H	X	h	x	ł	ś	Ę	Ş	Ł	ě	Ř	°	8
09	○	↓	)	9	I	Y	i	y	ē	Ö	ę	≡	≡	└	Ú	˘	9
10	⊙	→	*	:	J	Z	j	z	Ő	Ü		||	≡	└	ř	˘	A
11	♂	←	+	;	K	[	k	{	ő	Ť	ž	⌘	≡	■	Ů	ů	B
12	♀	└	,	<	L	\	l	|	î	ť	č	≡	≡	■	ý	ř	C
13	♪	↔	-	=	M	]	m	}	Ž	Ł	ş	Ž	=	Ť	Ý	ř	D
14	♪	▲	.	>	N	^	n	˘	Ä	×	«	ž	≡	Ů	ť	▪	E
15	⊛	▼	/	?	O	_	o	◊	Ć	č	»	└	⌘	■	˘		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘

– PC-858 Multilingual

Display: PC-858

ID Number: 13U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	Ł	đ	Ó	-	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	⌘	±	Đ	ß	±	1
02	●	↕	"	2	B	R	b	r	é	Æ	ó	⌘	±	Ê	Ô	=	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	└	Ě	Ò	¼	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	└	—	È	ô	¶	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	+	€	Õ	§	5
06	♠	—	&	6	F	V	f	v	â	û	ª	Â	ã	Í	μ	÷	6
07	●	↕	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	,	7
08	■	↑	(	8	H	X	h	x	ê	ÿ	ı	⊙	Ł	İ	þ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	®	≡	≡	└	Ú	˘	9
10	⊙	→	*	:	J	Z	j	z	è	Ü	¬	||	≡	└	û	˘	A
11	♂	←	+	;	K	[	k	{	ï	ø	½	⌘	≡	■	Ù	¹	B
12	♀	└	,	<	L	\	l	|	î	£	¼	≡	≡	■	ý	³	C
13	♪	↔	-	=	M	]	m	}	ì	ø	ı	≡	≡	ı	Ý	²	D
14	♪	▲	.	>	N	^	n	˘	Ä	×	«	¥	≡	İ	˘	▪	E
15	⊛	▼	/	?	O	_	o	◊	Å	f	»	└	⌘	■	˘		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘

Note: € sign in position D5 (hex)

– PC-Turkish

Display: **PC-8 TK**ID Number: **9T**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00		►		0	@	P	`	p	Ç	É	á	⋮	⊥	⊥	α	≡	0
01	☺	◄	!	1	A	Q	a	q	ü	æ	í	☒	⊥	⊥	β	±	1
02	☼	↑	"	2	B	R	b	r	é	Æ	ó	☒	⊥	⊥	Γ	≥	2
03	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⊥	⊥	π	≤	3
04	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⊥	⊥	⊥	Σ	∫	4
05	♣	§	%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	⊥	σ	∫	5
06	♠	–	&	6	F	V	f	v	â	û	Ğ	⊥	⊥	⊥	μ	÷	6
07	•	↑	'	7	G	W	g	w	ç	ù	ğ	⊥	⊥	⊥	τ	≈	7
08	◼	↑	(	8	H	X	h	x	ê	İ	ı	⊥	⊥	⊥	Φ	°	8
09	○	↓	)	9	I	Y	i	y	ë	Ö	ı	⊥	⊥	⊥	Θ	·	9
10	◼	→	*	:	J	Z	j	z	è	Ü	ı	⊥	⊥	⊥	Ω	·	A
11	♂	←	+	;	K	[	k	{	ï	ç	½	⊥	⊥	⊥	δ	√	B
12	♀	⊥	,	<	L	\	l	|	î	£	¼	⊥	⊥	⊥	∞	ⁿ	C
13	♪	↔	-	=	M	]	m	}	ı	¥	ı	⊥	⊥	⊥	φ	²	D
14	♪	▲	.	>	N	^	n	~	Ä	Ş	«	⊥	⊥	⊥	€	▪	E
15	☼	▼	/	?	O	_	o	△	Å	ş	»	⊥	⊥	⊥	∩		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☼

– Windows 3.1 Latin 1

Display: **WIN L1**ID Number: **19U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ð	à	ð	0
01			!	1	A	Q	a	q		‘	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r	,	’	ç	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s	f	“	£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u	...	•	¥	μ	Å	Ö	å	ö	5
06			&	6	F	V	f	v	†	–	ı	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w	‡	–	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x	^	˘	˙	˚	È	Ø	è	ø	8
09			)	9	I	Y	i	y	‰	™	©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	¾	Î	Þ	î	þ	E
15			/	?	O	_	o	☒		ÿ	–	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☼

– Windows 3.1 Latin 2 Display: WIN L2

ID Number: 9E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	Ř	Đ	ř	đ	0
01			!	1	A	Q	a	q		‘	˘	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r	,	’	ˇ	˙	Â	Ň	â	ň	2
03			#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	ó	3
04			\$	4	D	T	d	t	„	”	ⱥ	˘	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u	...	•	Ą	μ	Í	Ő	í	ő	5
06			&	6	F	V	f	v	†	–	ı	¶	Ć	Ö	ć	ö	6
07			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x		ˆ	˙	˘	Č	Ř	č	ř	8
09			)	9	I	Y	i	y	‰	™	©	ą	É	Û	é	û	9
10			*	:	J	Z	j	z	Š	š	Ş	ş	Ě	Ú	ě	ú	A
11			+	;	K	[	k	{	<	>	«	»	Ě	Ů	ě	ů	B
12			,	<	L	\	l	|	Š	ś	¬	Ł	Ě	Ü	ě	ü	C
13			-	=	M	]	m	}	Ť	ť	-	ˆ	Í	Ý	í	ý	D
14			.	>	N	^	n	~	Ž	ž	®	ı	Î	Ť	î	ț	E
15			/	?	O	_	o	☒	Ž	ž	Ž	ž	Đ	ß	đ	·	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– Windows 3.1 Latin 5 Display: WIN L5

ID Number: 5T

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ğ	à	ğ	0
01			!	1	A	Q	a	q		‘	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r	,	’	¢	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s	f	“	£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t	„	”	ⱥ	˘	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u	...	•	¥	μ	Å	Ö	å	ö	5
06			&	6	F	V	f	v	†	–	ı	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x	^	˘	ˆ	˙	È	Ø	è	ø	8
09			)	9	I	Y	i	y	‰	™	©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z	Š	š	ˆ	˙	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	ü	B
12			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	İ	í	ı	D
14			.	>	N	^	n	~			®	¾	Î	Ş	î	ş	E
15			/	?	O	_	o	☒		ÿ	–	ı	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– Desktop

Display: **DESKTOP**ID Number: **7J**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	‘	p				“	—	<	a	ˆ	0
01			!	1	A	Q	a	q			¶	”	±	>	°	`	1
02			"	2	B	R	b	r			§	μ	×	«	æ	^	2
03			#	3	C	S	c	s			†	‰	÷	»	Æ	ˆ	3
04			\$	4	D	T	d	t			‡	•	°	,	ð	˜	4
05			%	5	E	U	e	u			©	●	’	„	Ð	˘	5
06			&	6	F	V	f	v			®	◊	"	·	ij	˘	6
07			’	7	G	W	g	w			™	○	¼	j	IJ	ˆ	7
08			(	8	H	X	h	x			%	■	½	ı	ı	°	8
09			)	9	I	Y	i	y			¢	■	¾	Pt	Ł	˙	9
10			*	:	J	Z	j	z			—	□	1	ℓ	œ	˘	A
11			+	;	K	[	k	{			—	□	2	£	Œ	˘	B
12			,	<	L	\	l	|			...	’	3	¥	ø	˘	C
13			-	=	M	]	m	}			fi	¬	/	¤	Ø	˙	D
14			.	>	N	^	n	~			fl	ı		f	p	ı	E
15			/	?	O	_	o	☒				=		ß	þ		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– PS text

Display: **PS TEXT**ID Number: **10J**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	'	p						—			0
01			!	1	A	Q	a	q			i	—	`		Æ	æ	1
02			"	2	B	R	b	r			¢	†	'				2
03			#	3	C	S	c	s			£	‡	^		a		3
04			\$	4	D	T	d	t			/	·	˘				4
05			%	5	E	U	e	u			¥		˘			ı	5
06			&	6	F	V	f	v			f	¶	˘				6
07			'	7	G	W	g	w			§	•	˙				7
08			(	8	H	X	h	x			¤	,	ˆ		Ł	ı	8
09			)	9	I	Y	i	y			'	„			Ø	ø	9
10			*	:	J	Z	j	z			“	”	°		Œ	œ	A
11			+	;	K	[	k	{			«	»	˘		°	ß	B
12			,	<	L	\	l	|			<	...					C
13			-	=	M	]	m	}			>	‰	”				D
14			.	>	N	^	n	~			fi		˙				E
15			/	?	O	_	o				fl	ı	˘				F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– Ventura International Display: VN INTL

ID Number: 13J

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	'	p			„	‰	â	Å	Á	Æ	0
01			!	1	A	Q	a	q			À	“	ê	î	Ã	œ	1
02			"	2	B	R	b	r			Â	”	ô	Ø	ä	¶	2
03			#	3	C	S	c	s			È	°	û	Æ		†	3
04			\$	4	D	T	d	t			Ê	Ç	á	å		‡	4
05			%	5	E	U	e	u			Ë	ç	é	í	Í	—	5
06			&	6	F	V	f	v			Î	Ñ	ó	ø	ì	–	6
07			'	7	G	W	g	w			Ï	ñ	ú	æ	Ó		7
08			(	8	H	X	h	x			©	ï	à	Ä	Ò		8
09			)	9	I	Y	i	y			®	í	è	ì	Õ	ª	9
10			*	:	J	Z	j	z			™	¤	ò	Ö	ö	º	A
11			+	;	K	[	k	{		↵	<	£	ù	Ü	Š	«	B
12			,	<	L	\	l	|		→	>	¥	ä	É	š	•	C
13			-	=	M	]	m	}		␣	Ù	§	ë	ï	Ú	»	D
14			.	>	N	^	n	~		•	Û	f	ö	ß	ÿ		E
15			/	?	O	_	o			□		ø	ü	Ô	ÿ	...	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	per

– Ventura US

Display: VN US

ID Number: 14J

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	'	p			„	‰					0
01			!	1	A	Q	a	q				“					1
02			"	2	B	R	b	r				”				¶	2
03			#	3	C	S	c	s				°				†	3
04			\$	4	D	T	d	t								‡	4
05			%	5	E	U	e	u								—	5
06			&	6	F	V	f	v								–	6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x			©						8
09			)	9	I	Y	i	y			®						9
10			*	:	J	Z	j	z			™						A
11			+	;	K	[	k	{			¼						B
12			,	<	L	\	l	|			½					•	C
13			-	=	M	]	m	}			¾						D
14			.	>	N	^	n	~			•						E
15			/	?	O	_	o				□					...	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	?

– Microsoft Publishing Display: MS PUBL

ID Number: 6J

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00					²		‘				°				Ω		0
01			¹								’	•	`	`			1
02			”		℞					”	•	’	’				2
03			³		Š	%	š			^	●	^	^				3
04			⁴		™					~	◦	˘	˘				4
05			⁵								○	˘	˘			ı	5
06			⁷								○	˘	˘	IJ	ij		6
07			’								▪	’	’	L	l		7
08			⁹								▪	”	”	Ł	ł		8
09			⁰		Ÿ					fi	■						9
10			⁸		Ž		ž			fl	◻	°	°				A
11			†							ff	◻	˘	˘				B
12			,	”		ℓ				ff	◻						C
13			–	‡	–					ff	‰	”	”				D
14			...		–	⁶		“		Pt	<	◆	˘	˘			E
15			/		Œ	=	α		f	>	◇	˘	˘	˘	˘		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Σ ₊

– Math-8

Display: MATH-8

ID Number: 8M

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	∴	Π	∴	π				–	⊕	Å	Γ	Γ	0
01			✓	1	A	P	α	ρ			↑	V	⊙	⇐	└	└	1
02			”	2	B	Σ	β	σ			→	∃	⊗	⊢	┌	┌	2
03			°	3	Γ	T	γ	τ			↓	T	⊖	⊥	}	}	3
04			∞	4	Δ	Υ	δ	v			←	⊥	⊗	⊃	└	└	4
05			÷	5	E	Φ	ε	φ			↑	U	Λ	∫	∫	∫	5
06			α	6	Z	X	ζ	χ			⇒	∩	v	∫	φ	∫	6
07			’	7	H	Ψ	η	ψ			↓	∈	∇	∠	J	↓	7
08			(	8	Θ	Ω	θ	ω			⇐	⇒	–	∅	∇	∇	8
09			)	9	I	∇	ι	∂			↑	∉	◦	κ	∥	>	9
10			×	e	K	∂	κ	φ			↔	⊂	˘	└	∠	└	A
11			+	ε	Λ	ς	λ	π			↕	⊃	•	λ	/	\	B
12			,	<	M	≤	μ	≈			⇐	∅	•	℄	–	<	C
13			–	=	N	≠	ν	≡			≈	∅	○	∫	=	±	D
14			.	>	Ξ	≥	ξ	≠			Σ	⊂	†	℞	*	±	E
15			/	≈	O	–	o	⊗			–	⊃	‡	∫	≡		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Σ ₊

– PS Math

Display: PS MATH

ID Number: 5M

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	\equiv	Π	π				\circ	\Re	\angle	\diamond			0
01			!	1	A	Θ	α	θ			Υ	\pm	\Im	∇	\langle	\rangle	1
02			\forall	2	B	P	β	ρ			'	"	\Re	\otimes	\otimes	\int	2
03			#	3	X	Σ	χ	σ			\leq	\geq	\wp	\odot	\odot	\int	3
04			\exists	4	Δ	T	δ	τ			/	\times	\otimes	TM	TM	|	4
05			%	5	E	Y	ε	v			∞	α	\oplus	Π	Σ	J	5
06			&	6	Φ	ς	ϕ	ϖ			f	∂	\emptyset	\checkmark	\int	\int	6
07			\ni	7	Γ	Ω	γ	ω			\clubsuit	\bullet	\cap	\cdot	|	|	7
08			(	8	H	Ξ	η	ξ			\diamond	\div	U	\neg	|	J	8
09			)	9	I	Ψ	ι	ψ			\heartsuit	\neq	\supset	\wedge	\int	\int	9
10			*	:	ϑ	Z	φ	ζ			\spadesuit	\equiv	\supseteq	\vee	|	|	A
11			+	;	K	[	κ	{			\leftrightarrow	\approx	\nsubseteq	\Leftrightarrow	|	|	B
12			,	<	Λ	\therefore	λ	|			\leftarrow	\dots	\subset	\leftarrow	|	|	C
13			-	=	M	|	μ	}			\uparrow	|	\subseteq	\Uparrow	{	}	D
14			.	>	N	\perp	ν	\sim			\rightarrow	-	\in	\Rightarrow	|	J	E
15			/	?	O	$_$	o				\downarrow	\downarrow	\notin	\Downarrow	|		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	\int_{e+}

– Ventura Math

Display: VN MATH

ID Number: 6M

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	\equiv	Π	π				\diamond	\otimes	\leq	\downarrow	|	Π	0
01			!	1	A	Θ	α	θ			\checkmark	\supset	\blacklozenge	\leftarrow	\cdot	TM	1
02			\forall	2	B	P	β	ρ			|	\supseteq	\geq	\otimes	\angle	\Leftarrow	2
03			#	3	X	Σ	χ	σ			\int	\int	∂	"		\Leftrightarrow	3
04			\exists	4	Δ	T	δ	τ			|		\Re	f		\vee	4
05			%	5	E	Y	ε	v			|	\clubsuit	'	\Im	{	Σ	5
06			&	6	Φ	ς	ϕ	ϖ			|	\oplus	\Re	\odot	\int	TM	6
07			\ni	7	Γ	Ω	γ	ω			|	\otimes	\wp	\pm	\rangle	|	7
08			(	8	H	Ξ	η	ξ			\Uparrow	\subseteq	∞	\rightarrow		\int	8
09			)	9	I	Ψ	ι	ψ			\Rightarrow	U	\spadesuit	\uparrow	\neg	\emptyset	9
10			*	:	ϑ	Z	φ	ζ			\Downarrow	-	α	\neq	∇	\cap	A
11			+	;	K	[	κ	{			\lrcorner	\nsubseteq	\dots	\bullet	\equiv	\int	B
12			,	<	Λ	\therefore	λ	|			\rightarrow	\subset	|	/	\circ	|	C
13			-	=	M	|	μ	}			\sqcup	J	\wedge	\heartsuit	\leftrightarrow	|	D
14			.	>	N	\perp	ν	\sim			\cdot	|	\downarrow	\times	\int	|	E
15			/	?	O	$_$	o				\square	|	\approx	Υ	\int	\div	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	\int_{e+}

– Pi Font

Display: **PI FONT**ID Number: **15U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				ˆ	::	ℙ	┐	└									0
01				˘	△	∅	└	└									1
02			„	˘		℞	└	└									2
03			,	˙		Σ	└	└									3
04			“	↗			+	+									4
05			”	↘			+	+									5
06			‘	↙	f		—	+									6
07			’	↗			||	|									7
08			<	△	ℏ		U	U									8
09			>	▷			∩	∩									9
10			™	▽			∏	∏									A
11			SM	◁			∏	∏									B
12			®	◀	ℒ		∏	∏									C
13			©	§	ℓ		◇	◆									D
14			®	◀													E
15				¶				⊗									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⊗ ₊

– Legal

Display: **LEGAL**ID Number: **1U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	°	p									0
01			!	1	A	Q	a	q									1
02			”	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			’	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	[	k	§									B
12			,	=	L	®	l	¶									C
13			-	=	M	]	m	†									D
14			.	¢	N	©	n	™									E
15			/	?	O	_	o	⊗									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⊗ ₊

- ISO United Kingdom Display: ISO-4 ID Number: 1E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	[	k	{									B
12			,	<	L	\	l	|									C
13			-	=	M	]	m	}									D
14			.	>	N	^	n	~									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

- ISO US ASCII Display: ISO-6 ID Number: 0U

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	'	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	[	k	{									B
12			,	<	L	\	l	|									C
13			-	=	M	]	m	}									D
14			.	>	N	^	n	~									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO Swedish

Display: ISO-11

ID Number: 0S

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	É	P	é	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			¤	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	Å	k	å									B
12			,	<	L	Ö	l	ö									C
13			-	=	M	Å	m	å									D
14			.	>	N	Ü	n	ü									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO Italian

Display: ISO-15

ID Number: 0I

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	§	P	ù	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	°	k	à									B
12			,	<	L	ç	l	ò									C
13			-	=	M	é	m	è									D
14			.	>	N	^	n	ì									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO Spanish

Display: ISO-17

ID Number: 2S

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	\$	P	`	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	ı	k	°									B
12			,	<	L	Ñ	l	ñ									C
13			-	=	M	ı	m	ç									D
14			.	>	N	^	n	˘									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO German

Display: ISO-21

ID Number: 1G

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00			0	\$	P	`	p										0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	Ä	k	ä									B
12			,	<	L	Ö	l	ö									C
13			-	=	M	Ü	m	ü									D
14			.	>	N	^	n	ß									E
15			/	?	O	_	o	☒									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	☒ ₊

– ISO Norwegian

Display: ISO-60

ID Number: 0D

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			#	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	Æ	k	æ									B
12			,	<	L	Ø	l	ø									C
13			-	=	M	Å	m	å									D
14			.	>	N	^	n	ˆ									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– ISO French

Display: ISO-69

ID Number: 1F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	à	P	μ	p									0
01			!	1	A	Q	a	q									1
02			"	2	B	R	b	r									2
03			£	3	C	S	c	s									3
04			\$	4	D	T	d	t									4
05			%	5	E	U	e	u									5
06			&	6	F	V	f	v									6
07			'	7	G	W	g	w									7
08			(	8	H	X	h	x									8
09			)	9	I	Y	i	y									9
10			*	:	J	Z	j	z									A
11			+	;	K	°	k	é									B
12			,	<	L	ç	l	ù									C
13			-	=	M	§	m	è									D
14			.	>	N	^	n	ˆ									E
15			/	?	O	_	o	⌘									F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘ ₊

– **Windows 3.0 Latin 1** Display: **WIN 3.0**ID Number: **9U**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	@	P	`	p				°	À	Ð	à	ð	0
01			!	1	A	Q	a	q		‘	ı	±	Á	Ñ	á	ñ	1
02			"	2	B	R	b	r		’	ç	²	Â	Ò	â	ò	2
03			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó	3
04			\$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô	4
05			%	5	E	U	e	u			¥	µ	Å	Ö	å	ö	5
06			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö	6
07			'	7	G	W	g	w			§	·	Ç	×	ç	÷	7
08			(	8	H	X	h	x			¨	¸	È	Ø	è	ø	8
09			)	9	I	Y	i	y			©	ı	É	Ù	é	ù	9
10			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú	A
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û	B
12			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü	C
13			-	=	M	]	m	}			-	½	Í	Ý	í	ý	D
14			.	>	N	^	n	~			®	¾	Î	Þ	î	þ	E
15			/	?	O	_	o	⌘			-	¿	Ï	ß	ï	ÿ	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘

– **Windows 3.0 Baltic** Display: **WIN BALTIC**ID Number: **19L**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	ē	P	`	p	€			°	Ā	Š	ā	š	0
01			!	1	A	Q	a	q		‘		±	Ī	Ņ	ī	ņ	1
02			"	2	B	R	b	r	,	’	ç	²	Ā	Ņ	ā	ņ	2
03			#	3	C	S	c	s		"	£	³	Č	Ó	č	ó	3
04			\$	4	D	T	d	t	"	"	¤	´	Ä	Ö	ä	ö	4
05			%	5	E	U	e	u	...	•		µ	Å	Ö	å	ö	5
06			&	6	F	V	f	v	†	-	‡	¶	Ē	Ū	ē	ū	6
07			'	7	G	W	g	w	‡	-	§	·	Ē	×	ē	×	7
08			(	8	H	X	h	x			ø	ø	Č	Ū	č	ū	8
09			)	9	I	Y	i	y	‰	™	©	ı	É	Ē	é	ē	9
10			*	:	J	Z	j	z			®	ŗ	Ž	Š	ž	š	A
11			+	;	K	[	k	{	(	)	«	»	É	Ū	é	ū	B
12			,	<	L	\	l	|			¬	¼	Ģ	Ū	ģ	ū	C
13			-	=	M	]	m	}	"	-	-	½	Ķ	Ž	ķ	ž	D
14			.	>	N	^	n	~	ˆ	˜	•	¾	Ī	Ž	ī	ž	E
15			/	?	O	_	o	⊞				⌘	æ	Ļ	ß	ı	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌘

Note: € sign in position **80** (hex)

– **Symbol**Display: **none**ID Number: **19M**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	≅	Π	¬	π				°	κ	∠	◇	€	0
01			!	1	A	Θ	α	θ			Υ	±	ℑ	∇	⟨	⟩	1
02			√	2	B	P	β	ρ			'	"	℔	®	®	ƒ	2
03			#	3	X	Σ	χ	σ			≤	≥	℘	©	©	ƒ	3
04			∃	4	Δ	T	δ	τ			/	×	⊗	™	™	|	4
05			%	5	E	Y	ε	υ			∞	α	⊕	Π	Σ	J	5
06			&	6	Φ	ς	φ	ω			f	∂	∅	√	/	\	6
07			ə	7	Γ	Ω	γ	ω			♣	•	∩	•	|	|	7
08			(	8	H	Ξ	η	ξ			♦	+	U	¬	\	/	8
09			)	9	I	Ψ	ι	ψ			♥	≠	⊃	^	|	|	9
10			*	:	Θ	Z	φ	ζ			♠	=	⊇	v	|	|	A
11			+	;	K	[	κ	{			↔	≈	♀	↔	|	|	B
12			,	<	Λ	∴	λ	|			←	...	⊆	←	|	|	C
13			-	=	M	]	μ	}			↑	|	⊆	↑	{	}	D
14			.	>	N	⊥	v	~			→	—	∈	⇒	|	|	E
15			/	?	O	_	o				↓	↙	∉	↓	|		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	he

Note: € sign in position **F0** (hex)

This Symbol Set is only addressable via a PCL Command

– **Windings**Display: **none**ID Number: **579L**

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	0
01			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	1
02			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	2
03			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	3
04			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	4
05			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	5
06			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	6
07			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	7
08			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	8
09			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	9
10			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	A
11			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	B
12			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	C
13			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	D
14			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	E
15			☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	☞	F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	⌂

Note: € sign in position **7F** (hex)

This Symbol Set is only addressable via a PCL Command

– MICR - CMC7

Display: none

ID Number: 14Y

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0	1												0
01				1	2												1
02				2	3												2
03				3	4												3
04			4	5													4
05				5													5
06			6	7													6
07				7													7
08				8													8
09				9													9
10				A													A
11				B													B
12				C													C
13			13	D													D
14				E													E
15				F													F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

– MICR - E13B

Display: none

ID Number: 100

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
00				0													0
01				1			1										1
02				2			2										2
03				3			3										3
04			4	5			4										4
05				5													5
06			6	7			6										6
07				7													7
08				8													8
09				9													9
10				A													A
11				B													B
12				C													C
13			13	D													D
14				E													E
15				F													F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	