

HPRT Printer Programming Manual

REVISION RECORDS

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Document Conventions

Convention	Description
[expression list]	Items inside square brackets are optional, expression maximum length 2*1024 bytes;
<ESC>	ESCAPE(ASCII 27), control code of status polling command returns the printer status immediately.
~	(ASCII 126), control code of status polling command, returns the printer the printer status only when the printer is ready.
Space	(ASCII 32) characters will be ignored in the command line.
"	(ASCII 34), beginning and ending of expression
CR, LF	(ASCII 13), (ASCII10) denotes end of command line
NULL	(ASCII 0) supported in the expression, except the 2D bar code commands

Note: 203 DPI: 1mm=8 dots

Setup and System Commands

SIZE

Description

This command defines the label width and length.

Syntax

English system(inch)

SIZE m,n

Metric system(mm)

SIZE m mm, n mm

Dot measurement

SIZE m dot, n dot

<u>Parameter</u>	<u>Description</u>
m	Label width(inch or mm)
n	Label length(inch or mm)

Note:

203DPI: 1mm=8dots

300DPI:1mm=12dots

For metric and dot systems, there must be a space between parameter and "mm" or "dot".

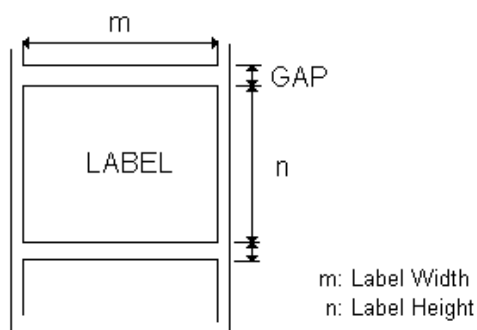
Example

(1) English system(inch)

SIZE 1.5, 2.2

(2) Metric system(mm)

SIZE38.1, 55.88



GAP

Description

This command sets the distance between two labels.

Syntax

English system(inch)

GAP m, n

Metric system(mm)

GAP m mm, n mm

<u>Parameter</u>	<u>Description</u>
m	The gap distance between two labels
n	The offset distance of the gap $n \leq \text{label length}(\text{inch or mm})$
0,0	Continuous label

Note:For metric system, there must be a space between parameter and “mm”.

BLINE

Description

This command sets the height of black line and user-defined feeding position after print.

Syntax

English system (inch)

BLINE m ,n

Metric system (mm)

BLINE m mm, n mm

Parameter

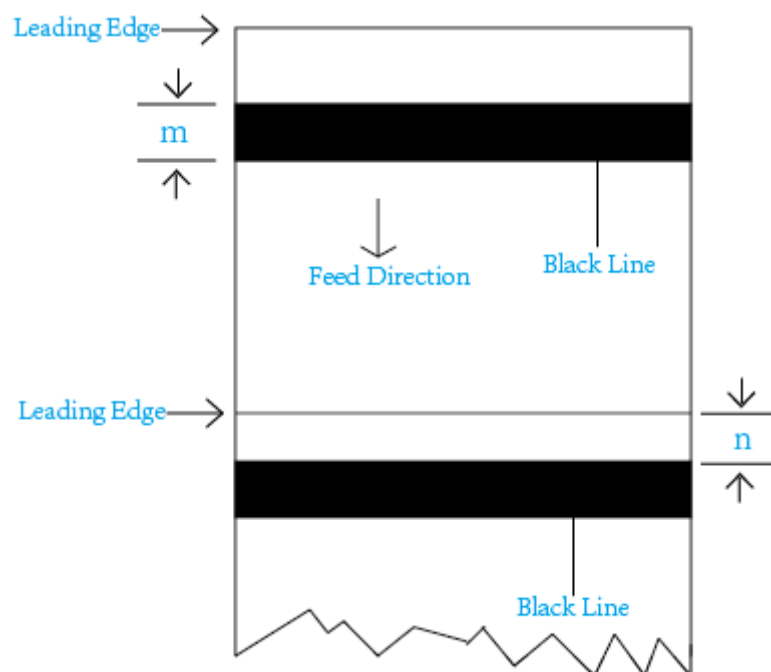
Description

m

The height of black line either in inch or mm

n

The offset distance of the gap $n \leq \text{label length}(\text{inch or mm})$



Note: For metric system, there must be a space between parameter and “mm”. When the sensor type is changed from “GAP” to “Black Mark”, please send the “BLINE” command to the printer first.

OFFSET

Description

This command defines the selective, extra label feeding length each form feed takes, which, especially in peel-off mode and cutter mode, is used to adjust label stop position, so as for label to register at proper places for the intended purposes. The printer back tracks the extra feeding length before the next run of printing.

Syntax

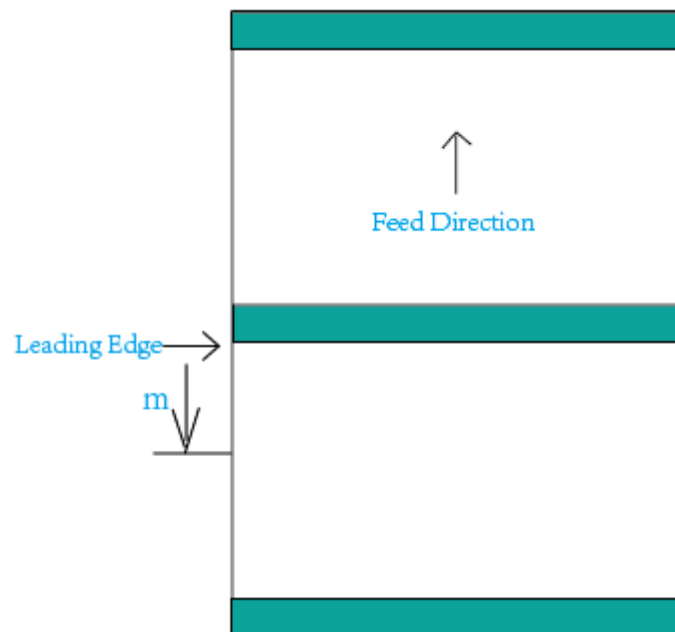
English system (inch)

OFFSET m

Metric system (mm)

OFFSET m mm

<u>Parameter</u>	<u>Description</u>
m	The offset distance (inch or mm), $-1 \leq m \leq 1$ (inch)



Note: Improperly offset value may cause paper jam.

SPEED

Description

This command defines the print speed.

Syntax

SPEED n

<u>Parameter</u>	<u>Description</u>
n	printing speed in inch per second

DENSITY

Description

This command sets the printing darkness.

Syntax

DENSITY n

<u>Parameter</u>	<u>Description</u>
n	0~15 0: specifies the highest level 15: specifies the darkest level

Note:

Default DENSITY setting is 2.

DIRECTION AND MIRROR IMAGE

Description

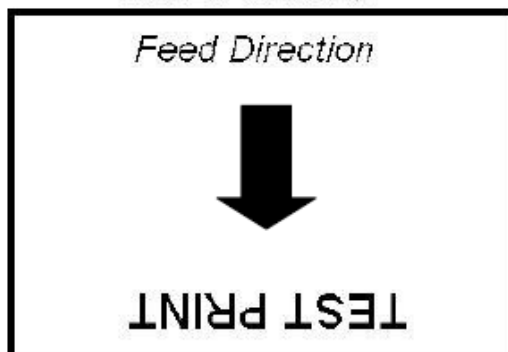
This command defines the printout direction and mirror image. This will be stored in the printer memory.

Syntax

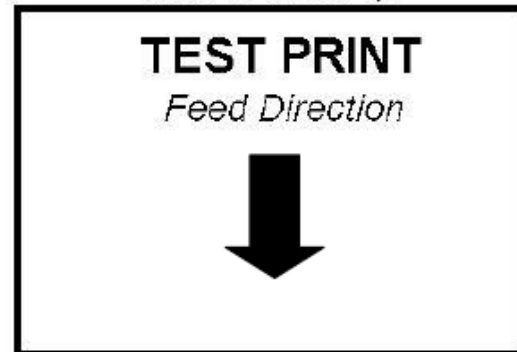
DIRECTION n[,m]

<u>Parameter</u>	<u>Description</u>
n	0 or 1. Please refer to the illustrations below:
m	0:Print normal image 1:Print mirror image

DIRECTION 0,0



DIRECTION 1,0



DIRECTION 0,1



DIRECTION 1,1



REFERENCE

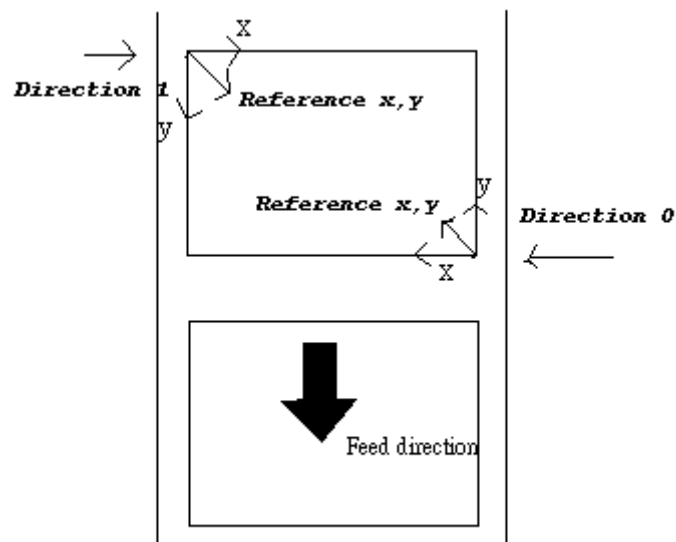
Description

This command defines the reference point of the label. The reference(origin) point varies with the print direction, as shown:

Syntax

REFERENCE x, y

<u>Parameter</u>	<u>Description</u>
x	Horizontal coordinate (in dots)
y	Vertical coordinate (in dots)



Note: 203DPI: 1mm=8dots

300DPI: 1mm=12dots

SHIFT

Description

This command moves the label's vertical position. A positive value moves the label further from the printing direction; a negative value moves the label towards the printing direction.

Syntax

SHIFT n

<u>Parameter</u>	<u>Description</u>
n	The value of n is: $-90 \leq n \leq 90$

CODEPAGE

Description

This command defines the code page of international character set.

Syntax

CODEPAGE n

<u>Parameter</u>	<u>Description</u>
n	Name or number of code page, which can be divided into 7-bit code page and 8-bit code page. <u>7-bit code page name</u> USA:USA BRI:British GER:German FRE:French DAN:Danish ITA:Italian SPA:Spanish SWE:Swedish SWI: Swiss <u>8-bit code page number</u> 437:United States 850:Multilingual 852:Slavic 860:Portuguese 863:Canadian/French 865:Nordic 857:Turkish(TSPL2 printers only) <u>Windows code page</u> 1250:Central Europe(TSPL2 printers only) 1252:Latin I(TSPL2 printers only) 1253:Greek(TSPL 2 printers only) 1254:Trukish(TSPL2 printers only)

Note: DATA LENGTH determines 7-bit or 8-bit communications parameter.

CLS

Description

This command clears the image buffer.

Syntax

CLS

<u>Parameter</u>	<u>Description</u>
None	N/A

Note: This command must be placed after SIZE command.

FEED

Description

This command feeds label with the specified length. The length is specified by dot.

Syntax

FEED n

<u>Parameter</u>	<u>Description</u>
n	Unit: dot $1 \leq n \leq 9999$

Example

FEED 80(=10mm)

BACKFEED

Description

This command feeds the label in reverse. The length is specified by dot.

Syntax

BACKFEED n

<u>Parameter</u>	<u>Description</u>
n	Unit: dot $1 \leq n \leq 9999$

Note: Improperly back feed value may cause paper jam or wrinkle.

FORMFEED

Description

This command feeds the label to the beginning of next label.

Syntax

FORMFEED

<u>Parameter</u>	<u>Description</u>
None	N/A

HOME

Description

This command will feed label until the internal sensor has determined the origin. Size and gap of the label should be defined before using this command.

Syntax

HOME

<u>Parameter</u>	<u>Description</u>
None	N/A

PRINT

Description

This command prints the label format currently stored in the image buffer.

Syntax

PRINT m [,n]

<u>Parameter</u>	<u>Description</u>
m	Specifies how many sets of labels will be printed. $1 \leq m \leq 999999999$ If m=1, printer will print the last label content for n copies.
n	Specifies how many copies should be printed for each particular label set. $1 \leq n \leq 999999999$

SELFTEST

Description

At this command, the printer will print out the printer information.

Syntax

SELFTEST

Label Formatting Commands

BAR

Description

This command draws a bar on the label format.

Syntax

BAR x, y, width, height

<u>Parameter</u>	<u>Description</u>
x	The upper left corner x-coordinate (in dots)
y	The upper left corner y-coordinate (in dots)
width	Bar width (in dots)
height	Bar height (in dots)

BARCODE

Description

This command prints 1D barcodes. The available bar codes are listed below:

Code 128 (switching code subset automatically)

Code 128M (switching code subset manually)

Code 39

Code 93

EAN 13

EAN 8

UPC-A

UPC-E

Syntax

BARCODE X,Y, "code type", height, human readable, rotation, narrow, wide, "code"

<u>Parameter</u>	<u>Description</u>
X	Specifies the x-coordinate of the bar code on the label
Y	Specifies the y-coordinate of the bar code on the label
code type	
128	Code 128, switching code subset A, B, C automatically.
128M	Code 128, switching code subset A, B, C manually.
height	Bar code height (in dots)
human readable	0: Not readable 1: Human readable
rotation	0: No rotation 90: Rotate 90 degrees clockwise 180: Rotate 180 degrees clockwise 270: Rotate 270 degrees clockwise
narrow	Width of narrow element (in dots)
wide	Width of wide element (in dots)

BITMAP

Description

This command draws bitmap images(as opposed to BMP graphic files).

Syntax

BITMAP X,Y, width, height, mode, bitmap data...

<u>Parameter</u>	<u>Description</u>
X	Specifies the x-coordinate
Y	Specifies the y-coordinate
width	Image width(in bytes)
height	Image height(in dots)
mode	Graphic modes listed below 0:OVERWRITE 1:OR 2:XOR
bitmap data	Bitmap data

BOX

Description

This command draws rectangles on the label.

Syntax

BOX X_start, Y_start, X_end, Y_end, line thickness

<u>Parameter</u>	<u>Description</u>
X_start	Specifies x-coordinate of upper left corner(in dots)
Y_start	Specifies y-coordinate of upper left corner(in dots)
X_end	Specifies x-coordinate of lower right corner(in dots)
Y_end	Specifies y-coordinate of lower right corner(in dots)
Line thickness	Line thickness(in dots)

Recommended max. Thickness of box is 12mm at 4" width. Thickness of box larger than 12mm may damage the power supply and affect the print quality.

Max. print ratio is different for each printer model. Desktop and industrial printer print ratio is limited to 20% and 30% respectively.

CIRCLE

Description

This command draws a circle on the label.

Syntax

CIRCLE X_start, Y_start, diameter, circle thickness

<u>Parameter</u>	<u>Description</u>
X_start	Specifies x-coordinate of upper left corner(in dots)
Y_start	Specifies y-coordinate of upper left corner(in dots)
diameter	Specifies the diameter of the circle(in dots)
thickness	Thickness of the circle(in dots)

ERASE

Description

This command clears a specified region in the image buffer..

Syntax

ERASE X_start, Y_start, X_width, Y_height

<u>Parameter</u>	<u>Description</u>
X_start	The x-coordinate of the starting point(in dots)
Y_start	The y-coordinate of the starting point(in dots)
X_width	The region width in x-axis direction(in dots)
Y_height	The region height in y-axis direction(in dots)

PUTPCX

Description

This command prints PCX format images.

Syntax

PUTPCX X,Y, "filename"

<u>Parameter</u>	<u>Description</u>
X	The x-coordinate of the PCX image
Y	The y-coordinate of the PCX image
filename	The downloaded PCX filename. Case sensitive

QRCODE

Description

This command prints QR code.

Syntax

QRCODE X, Y, ECC Level, cell width, mode, rotation, [model, mask] "Data string"

<u>Parameter</u>	<u>Description</u>
X	The upper left corner x-coordinate of the QR code
Y	The upper left corner y-coordinate of the QR code
ECC Level	Error correction recovery level L: 7% M: 15% Q: 25% H: 30%
Cell width	1,3,5,7,10,12
mode	Auto/manual encode A: Auto M: Manual
rotation	0: 0 degree 90: 90 degree 180: 180 degree 270: 270 degree

model	M1: original version(default) M2: enhanced version
mask	S0, S3, S5,S7, S8, S9
Data string	The encodable character set is described as below

Encodable character set:

1). Numeric data: (digits 0~9)

2). Alphanumeric data

Digits 0-9

Upper case letters A-Z;

Nine other characters: space, \$ % * + - . / :);

3). 8-bit byte data.

JIS 8-bit character set (Latin and Kana) in accordance with JIS X 0201

4). Kanji characters

Shift JIS values 8140HEX –9FFCHEX and E040HEX –EAA4 HEX. These are values shifted from those of JIS X 0208. Refer to JIS X 0208 Annex 1 Shift Coded Representation for detail.

Data characters per symbol (for maximum symbol size):

	<u>Model 1 (Version 14-L)</u>	<u>Model 2 (Version 40-L)</u>
1). Numeric data	1,167 characters	7,089 characters
2). Alphanumeric data:	707 characters	4,296 characters
3). 8-bit byte data:	486 characters	2,953 characters
4). Kanji data:	299 characters	1,817 characters

*If "A" is the first character in the data string, then the following data after "A" is Alphanumeric data.

*If "N" is the first character in the data string, then the following data after "N" is numeric data.

*If "B" is the first character in the data string, then the following 4 digits after "B" is used to specify numbers of data. After the 4 digits is the number of bytes of binary data to be encoded.

*If "K" is the first character in the data string, then the following data after "K" is Kanji data.

*If "!" is in the data string and follows by "N", "A", "B", "K" then it will be switched to specified encodable character set.

REVERSE

Description

This command reverses a region in image buffer.

Syntax

REVERSE X_start, Y_start, X_width,Y_height

<u>Parameter</u>	<u>Description</u>
X_start	The x-coordinate of the starting point (in dots)
Y_start	The y-coordinate fo the starting point (in dots)
X_width	X-axis region width (in dots)
Y_height	Y-axis region height (in dots)

Note: **203DPI: 1mm=8dots**

300DPI:1mm=12dots

Max. print ratio is different for each printer model. Desktop and industrial printer print ratio is limited to 20% and 30% respectively.

TEXT

Description

This command prints text on label

Syntax

TEXT X, Y, "font", rotation, x-multiplication, y-multiplication, "content"

<u>Parameter</u>	<u>Description</u>
X	The x-coordinate of the text
Y	The y-coordinate of the text
font	Font name 0: Monotype CG Triumvirate Bold Condensed, font width and height is stretchable 1: 8 x 12 fixed pitch dot font 2: 12 x 20 fixed pitch dot font 3: 16 x 24 fixed pitch dot font 4: 24 x 32 fixed pitch dot font 5: 32 x 48 dot fixed pitch font 6: 14 x 19 dot fixed pitch font OCR-B 7: 21 x 27 dot fixed pitch font OCR-B 8: 14 x25 dot fixed pitch font OCR-A ROMAN.TTF: Monotype CG Triumvirate Bold Condensed, font width and height proportion is fixed
rotation	The rotation angle of text 0 : No rotation 90 : degrees, in clockwise direction 180 : degrees, in clockwise direction 270 : degrees, in clockwise direction
x-multiplication	Horizontal multiplication, up to 10x. Available factors: 1~10 For "ROMAN.TTF" true type font, this parameter is ignored. For font "0", this parameter is used to specify the width (point) of true type font. 1 point=1/72 inch.
Y-multiplication	Vertical multiplication, up to 10x Available factors: 1~10 <i>For true type font, this parameter is used to specify the height (point) of true type font. 1 point=1/72 inch.</i>

Status Polling Commands(RS-232)

<ESC>!?

Description

This command obtains the printer status at any time, even in the event of printer error. An inquiry request is solicited by sending an <ESC> (ASCII 27, escape character) as the beginning control character to the printer. A one byte character is returned, flagging the printer status. A 0 signifies the printer is ready to print labels.

Syntax

<ESC>!?

<u>Parameter</u>	<u>Description</u>
N/A	N/A

<u>Bit(return value)</u>	<u>Status</u>
0	Head opened
1	Paper jam
2	Out of paper
3	Out of ribbon
4	Pause
5	Printing
6	Cover opened(option)

<ESC>!R

Description

This command resets the printer. The beginning of the command is an ESCAPE character (ASCII 27). The files downloaded in memory will be deleted. This command cannot be sent in dump mode.

Syntax

<ESC>!R

<u>Parameter</u>	<u>Description</u>
N/A	N/A

~!D

Description

This command enters the printer into DUMP mode. In DUMP mode, the printer outputs code directly without interpretation.

Syntax

~!D

<u>Parameter</u>	<u>Description</u>
None	N/A

File Management Commands

DOWNLOAD

Description

“DOWNLOAD” is a header of the file that is to be saved in the printer’s memory. The download files can be divided into two categories: program files and data files (including text data files, PCX graphic files and bitmap font files).

Syntax

1. Download a program file:

DOWNLOAD [n,] “FILENAME.BAS”

<u>Parameter</u>	<u>Description</u>
n	Specify memory used to save downloaded files. n is ignored: Download files to DRAM only. E: Download files to main board flash memory F: Download files to expansion memory module
FILENAME.BAS	The filename resident in printer memory

Note:

- (1). Filenames are case sensitive.**
- (2). File extensions must be “.BAS”.**
- (3). Filenames must in 8.3 format.**
- (4). It should use with EOP command.**
- (5). If memory is not specified, all files will be download to DRAM.**
- (6). Download same filename to same memory the previous file will be covered.**
- (7). No Battery is used to back up files in DRAM which will lost in the event printer power is lost.**
- (8). Download will failed when storage is insufficient.**

2.Download a data file:

DOWNLOAD [n,] "FILENAME", DATA SIZE, DATA CONTENT.....

<u>Parameter</u>	<u>Description</u>
n	Specify memory used to save downloaded files. n is ignored: Download files to DRAM only. E: Download files to main board flash memory F: Download files to expansion memory module
FILENAME	The name of data file that will remain resident in the printer memory(case sensitive)
DATA SIZE	The actual size in bytes of the data file(without header)
DATA CONTENT	The data which will be downloaded into printer

Note:

(1). For text data files, CR(carriage return) 0x0D and LF(Line Feed) 0x0A is the separator of data.

(2). If memory is not specified, all files will be download to DRAM.

No Battery is used to back up files in DRAM which will lost in the event printer power is lost.

EOP**Description**

End of program. To declare the start and end of BASIC language commands used in a program.

DOWNLOAD "FILENAME.BAS" must be added in the first line of the program, and "EOP" statement at the last line of program.

Syntax

EOP

FILES

Description

This command prints out the total memory size, available memory size and files lists(or lists the files through RS-232) in the printer memory(both FLASH memory and DRAM).

Syntax

FILES

KILL

Description

This command deletes a file in the printer memory. The wild card(*) will delete all files resident in specified DRAM memory.

Syntax

KILL[n], "FILENAME"

<u>Parameter</u>	<u>Description</u>
n	Specify the memory location that files will be deleted. n is ignored: Kill files saved in DRAM.

Note:

(1). If optional parameter n is not specified, firmware will delete the file in DRAM.

(2).Syntax example

KILL "FILENAME" : Delete the specify file in DRAM

KILL "*.PCX" : Delete all PCX files in DRAM

KILL "*" : Delete all files in DRAM

RUN

Description

This command executes a program resident in the printer memory.

This command is available for TSPL language printers only.

Syntax

RUN "FILENAME.BAS"

Device Reconfiguration Commands

SET COUNTER

Description

Counters can be a real counter or a variable. This setting sets the counter number in the program and its increments. There are three different types of counters: digit (0~9~0), lower case letter (a~z~a) or upper case letter (A~Z~A).

Syntax

SET COUNTER @n step

@n = "Expression"

<u>Parameter</u>	<u>Description</u>
@n	n: counter number. There are 51 counters available (@0~@50) in the printer.
step	The increment of the counter, can be positive or negative. -999999999 <= step <= 999999999 <i>If the counter is used as a fixed variable, please set the increment to 0.</i>
Expression	Initial string. String length is 101 bytes

SET CUTTER

Description

This setting activates or deactivates the cutter and defines how many printed labels is to be cut at one time.

Syntax

SET CUTTER OFF/BATCH/pieces

<u>Parameter</u>	<u>Description</u>
OFF	Disable cutter function.
BATCH	Set printer to cut label at the end of printing job
Pieces	Set 3 printing labels per cut

SET PEEL

Description

This setting is used to enable/disable the self-peeling function. The default setting for this function is off. When this function is set on, the printer stops after each label printing, and does not print the next label until the peeled label is taken away. This setting will be saved in printer memory when turning off the power.

Syntax

SET PEEL ON/OFF

<u>Parameter</u>	<u>Description</u>
ON	Enable the self-peeling function
OFF	Disable the self-peeling function

SET TEAR

Description

This setting is used to enable/disable feeding labels/black mark to position of tearing off.

Syntax

SET TEAR ON/OFF (TSPL language printers only)

<u>Parameter</u>	<u>Description</u>
ON	The label gap will stop at the tear off position after print.
OFF	The label gap will NOT stop at the tear off position after print. The beginning of label will be aligned to print head.

SET RIBBON

Description

This setting is used to enable/disable ribbon sensor detection. (Thermal Transfer Printing/Thermal Direct Printing) Printer will detect the presence of a ribbon to determine using either direct thermal or thermal transfer printing upon printer startup. This setting will be saved in printer memory after turning off the power.

Syntax

SET RIBBON ON/OFF

<u>Parameter</u>	<u>Description</u>
ON	Thermal transfer printing
OFF	Thermal direct printing

SET COM1

Description

This setting defines communication parameters for printer serial port.

Syntax

SET COM1 baud, parity, data, stop

<u>Parameter</u>	<u>Description</u>
baud	Baud rate, available baud rates are as listed : 96: 9600 bps 19: 19200 bps 38: 38400 bps 57: 57600 bps 115: 115200 bps
parity	Parity check N: No parity check E: Even parity check O: Odd parity check
Data	Data bit 8: 8 bits data 7: 7 bits data

stop

Stop bit

1: 1 stop bit

2: 2 stop bits