

USER'S MANUAL

D5000

Impact Dot Matrix Printer

DECLARE

§ This product belongs to A grade, maybe it will cause radio disturbance at natural environment, In such circumstances, needs that the user takes practicable measures for it.

COPYRIGHT

----- This document made by 2005

----- Edition: 3.2

TABLE OF CONTENTS

Chapter I Introduction.....	5
1.1 Technique Specification.....	5
1.2 Printing Paper.....	5
1.3 Printing Character.....	5
1.4 Interface Form.....	6
1.5 Power and Operating Environmental Conditions.....	6
1.6 Dimension and Weight.....	6
Chapter II Installation and Operation.....	7
2.1 Printer Overview.....	7
2.2 Control Board.....	7
2.3 Interface Connection.....	7
2.3.1 Serial Interface.....	7
2.3.2 Parallel Interface Connection.....	8
2.3.3 Cash drawer interface.....	9
2.4 Panel LED and Buttons.....	10
2.5 Black mark printing should be noticed.....	11
2.6 Installing paper should be noticed.....	11
Chapter III Print Table.....	12
3.1 Printer set command.....	12
3.2 Command Illustration.....	13
3.3 Printing command.....	14
3.3.1 Printing command.....	14
HT.....	14
LF.....	14
CR.....	15
DLE EOT n.....	15
DLE ENQ n.....	17
ESC SP n.....	17
ESC ! n.....	18
Esc % n.....	18
ESC &.....	18
ESC *.....	19
ESC – n.....	20
ESC 2.....	20
ESC 3 n.....	20
ESC ? n.....	21
ESC @.....	21
ESC D.....	21
ESC J n.....	22
ESC K n.....	22
ESC R n.....	22
ESC U n.....	23

ESC c 3 n.....	23
ESC c 4 n.....	24
ESC c 5 n.....	25
ESC d n.....	25
ESC e n.....	26
ESC p m t1 t2.....	26
ESC t n.....	26
GS (A PL PH n m.....	26
GS V m.....	27
GS V m n.....	27
GS r n.....	27
GS z 0 t1 t2.....	28
FS ! n.....	29
FS &.....	29
FS.....	30
FS 2 c1 c2 d1...dk.....	30
FS ? c1 c2.....	31
FS S n1 n2.....	31
FS W n.....	31
GS (F pL pH a m nL nH.....	32
GS FF.....	34

Chapter I Introduction

1.1 Technique Specification

Item	Parameter
Printing Mode	9-pin serial configuration
Printing Density	42CPL-210(Full dot)/420(Half dots) 40CPL-200(Full dot)/400(Half dots)
Printing Speed	Approximately 7.1 Line/Sec (printing 16 characters per line) Approximately 4.1 Line/Sec(printing 40 characters per line); Approximately 4 Line/Sec(printing 42 characters per line)
Printing Width	42 CPL-42(7×7) /35 (5×7) 40 CPL-40(7×7) /33 (5×7)
Feeder Speed	About 100 mm/sec
Black Mark Inspection	Black mark printed at the right side of the receipt, the height is 5 mm (along the feeder direction), the min width is 12 mm; The reflect rate of the black mark not more than 10%, the reflect rate of the rest part more than 75%
Ribbon	ERC-39 Ribbon; Color: Purple or Black
Reliability of the Printing	9 million line(MCBF), the ribbon which was appointed by the manufacturer is necessary

1.2 Printing Paper

Item	Parameter
Paper Roll Type	High quality plain paper or thermal roller paper
Specification of Paper Roll	Width: 76.2 ± 0.5 mm; Max Diameter: $\phi 80$ mm Thickness: 0.25 mm; Recommended paper: Top and middle sheets N40(thickness: 0.06 mm, mass:47.2 g/m ²), Bottom sheet N60(thickness:0.08 mm, mass:68.0g/m ²).

1.3 Printing Character

Item	Parameter
IBM Character Set	7×7 dot or 5×7 dot
International Standard I、II Class Chinese Font	15×16 dot

1.4 Interface Form

Item	Parameter
Serial Interface	D-SUB 25 thread socket(female), Compatible with RS-232; Support DTR/DSR; Asynchronous Serial Communication: 9600bps/19200bps; 8 digit data; 1 digit stop
Parallel Interface	8 digit Parallel Interface, BUSY handshake protocol, interface socket us

	e D-SUB25 thread socket(male)
Cash Drawer	DC 24V, 2 A, 6 Thread RJ-11 Socket

1.5 Power and Operating Environmental Conditions

Item	Parameter
Power Supply	DV24V, 2A
Operating Temp	5~40℃
Operating Relative Humidity	10---80%
Storage Temp	—20~60℃
Storage Relative Humidity	10---90%

1.6 Dimension and Weight

Item	Parameter
Dimension	245(L) × 150 (W) × 133 (H) mm
Weight	D5000D 2 kg(Without Roller)
	D5000B(With Cutter) 2.2 kg(Without Roller)

Chapter II Installation and Operation

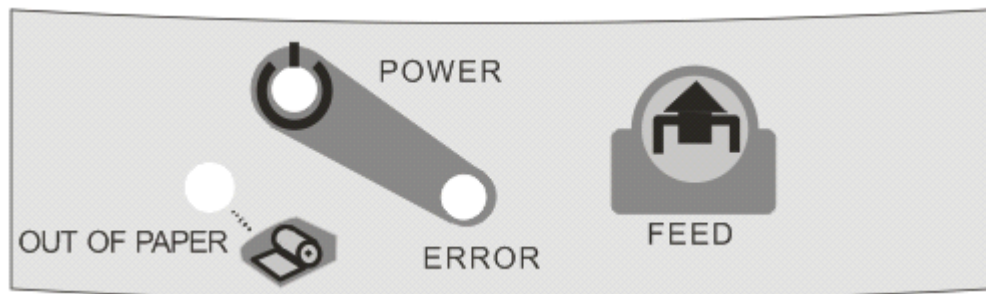
2.1 Printer Overview



2-1 D5000

2.2 Control Board

D5000 Printer Board has one keys and three indicator lights, the graphic as follows:



The sketch graphic of control board

2.3 Interface Connection

2.3 .1 Serial Interface

The serial interface of D5000 printer is compatible with RS-232, supports DTR/DSR handshake Asynchronous serial communication: 9600bps/19200bps; 8 data digit, and 1 stop digit.

Signal definition per pin.

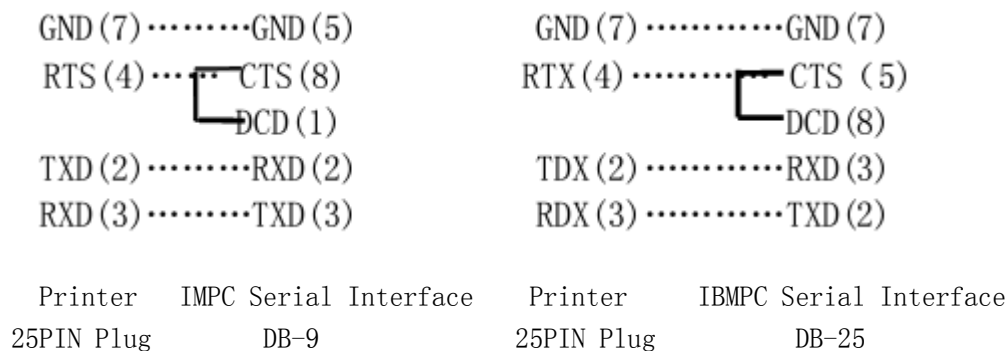
Pin	Signal	Signal Source	Function
2	TXD	Printer	Transmit Data

3	RXD	The host computer	Receive data
4	RTS	Printer	1.When DTR/DSR control is selected ,this signal indicates whether the printer is BUSY. SPACE indicates that the printer is READY to receive data, and MARK indicates that the printer is BUSY.
20	DTR		
6	DSR	The host computer	Indicates whether the host can receive data. SPACE indicates that the host can receive data, and MARK indicates that the host cannot receive data. When DTR/DSR control is selected, the printer transmits data after checking this signal(except when data is sent by DLE EOT)
7	GND	-----	Signal ground

Notes: Signal level: MARK= - 3 ~ - 15V, Logic “1” ;

SPACE= + 3 ~ + 15V, Logic “0” .

The serial interface of D5000 printer can connect with standard RS-232C interface, Connecting with PC, the wire picture as 2-3.1.



Picture 2-3.1 D5000 printer serial interface and PC serial interface connection sketch map

2.3.2 Parallel Interface Connection.

The parallel interface of D5000 printer is 8 digit parallel interface, supporting BUSY handshaking, and the interface socket used DB25 thread socket(male).

Interface pin Assignments

Pin	Signal	Signal Source	Function
1	nStrobe	H	Data is selected through spring puls

			e, receiving data at decline.
2	DATA1	H	0-----7 are data bits
3	DATA2	H	
4	DATA3	H	
5	DATA4	H	
6	DATA5	H	
7	DATA6	H	
8	DATA7	H	
9	DATA8	H	
10	nAck	P	Input impedance “high” level
11	BUSY	P	“High” level indicates that printer is “busy” now, can’t receive date
12	PE	P	“High” level indicates that print paper-end
13	SEL	P	Input impedance “high” level
15	nERR	P	Input impedance “high” level
14、16、17	NC		
17-18	GND		Gound

H: means computer, P: means printer

Data Receiving Timing

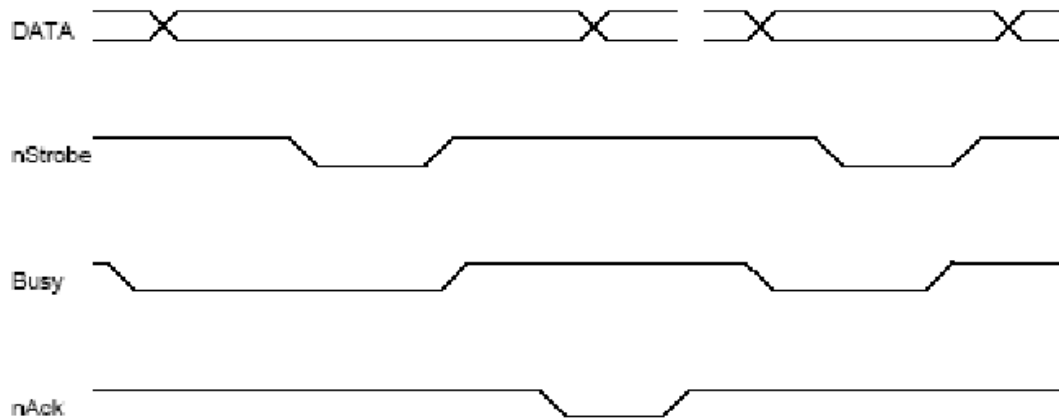


Figure 2-3.2 Parallel Interface Signal Time Sequence

2.3.3 Cash drawer interface

The cash drawer interface of D5000 printer used RJ-11, 6 thread socket, as the diagram 2-3.3

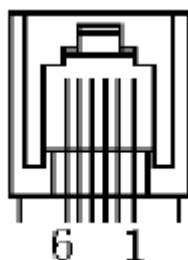


Figure Cash Drawer Interface

Drawer Kick-out Connector Pin Assignments:

Pin No.	Signal
1	Frame GND
2	Drawer kick-out drive signal 1
3	Drawer open/close signal
4	+24V
5	Drawer kick-out drive signal 2
6	Signal ground

2.4 Panel LED and Buttons

Indicator:

Power LED: Green

ON: Power supply is stable.

OFF: Power supply is not stable.

PAPER OUT LED: RED

ON: End of paper roll is detected.


OFF: Adequate paper remains on the paper roll

Error LED: RED

ON: Offline

Blinking: Error state.

OFF: Normal operation.

Error	Description	ERROR LED blinking pattern	Recovery
Print head temperature error (*)	Print head temperature is extremely high.	 approx. 160 ms	Automatically recovers when the print head temperature falls.

Print head over temp, error light flashed till restoring by itself.

Incorrect printer head position, error light flashed two times and stopped a while, then repeated this phenomenon till error exclusion.

Incorrect black mark, error light flashed three times and stopped a while, then repeated this phenomenon till error exclusion.

Incorrect cutter, error light flashed one time and stopped a while, then repeated this phenomenon till error exclusion.

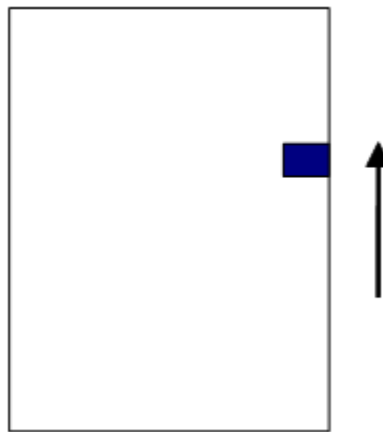
- No paper light, when the paper not be set well, or no paper, the light will be bright.

Key

- Under the black mark pattern, pressing the key, printer paper rolled the paper to the head of the next page; Under the general pattern, pressing the key, printer paper moved ahead.
- Self-test pattern, pressing key and inputting electric less than 6 seconds, the printer moves to self-test pattern, and print self-test list.
- Hex print pattern: pressing key and inputting electric more than 6 seconds, no paper light will be bright, and printer move to hex printer pattern.

2.5 Black mark printing should be noticed

- Black mark must be printed at the right side of the receipt. (If need the left side of black mark model, please contact manufacturer)
- Black mark printing measure is (width multiply height): 12×5 mm.
- The black degree of black mark must be saturated enough, the reflect rate not more than 10%; the rest part of printed black mark's white degree must be saturated enough, the reflect rate more than 75%.



The direction of entering paper

2.6 Installing paper should be noticed

Test switch test that there are no paper, no paper light will be bright, indicates no paper, and waited for installing. At the operation process of installing paper, when test switch tests paper again, no paper light turning off, and opening entering paper motor, installing paper by itself. If the present black mark position effects, moving paper to GS by itself and testing black mark (F: be set the first part of page). Or, self-moving paper about 80mm

Notes:

1. When installing paper, needs to clip the end of paper and inserts to paper entrance exactly, Puts your strength balance, moves the end of paper ahead till feeding paper motor revolved, and takes out paper by itself. When installing paper if the end of paper jams in the paper entrance, comes out paper jams, waits self-moving paper motor stopping and pulls paper out. Clips the foldable part, installs paper again.
2. After the user installing the roller paper into printer, presses entering-paper key, Please makes sure covering printer lid, Or, it may make machine paper jams.

Chapter III Print Table

3.1 Printer set command

Printer set command. The set content of this command won' t be lost if turning the power off.

ASC II	ESC	N	m	n
DECIMAL	27	78	m	n
HEX	1B	4E	m	n

Parameter Illustration		Parameter Illustration	
m=1 Choose cutter	n=1 Printer with cutter n=0 Printer without cutter Default n=0 Printer without cutter	m=6 Choose unidirectional and directional printing	n=1 Choose unidirectional printing n=0 Choose directional printing Default n=0 Choose directional printing
m=2 Choose receiving machine	n=1 Printer with receiving machine n=0 Printer without receiving machine Default n=0 Printer without receiving machine	m=7 Choose black mark pattern	n=1 Choose black mark mode n=0 Choose non-black mark mode Default n=0 Choose non- black mark mode

m=3 Choose cutter work pattern	n=1 Cutter with half cut n=0 Cutter with full cut	m=8 Choose Chinese pattern	Choose Chinese pattern n=0 Choose ASCII mode Default choose Chinese mode
m=4 Choose each line character	n=1 42 character per line n=0 40 character per line Default n=0 40 character per line	m=9 Choose width	n=1 Choose 76 mm paper n=0 Choose 58 mm paper Default n=1 Choose 76 mm paper
m=5 Choose serial baud rate	n=1 19200bps n=0 9600bps Default n=0 9600bps		

3.2 Command Illustration

Command	Illustration
HT	Horizontal tab
LF	Print and line feed
CR	Print and carriage return
DLE EOT n	Real-time status transmission
DLE ENQ n	Real-time request to printer
ESC SP n	Set right-side character spacing
ESC ! n	Select character print mode(s)
ESC % n	Select/cancel user-defined characters
ESC &	Define user-defined characters
ESC *	Select bit-image mode
ESC - n	Turn underline mode on/off
ESC 2	Select default line spacing
ESC 3	Set character line spacing n/144 feet
ESC ? n	Cancel user-defined character
ESC @	Initialize printer
ESC D	Set horizontal tab position
ESC J n	Print and feed paper n/144 feet
ESC K n	Print and reverse feed paper n/144 feet
ESC R n	Select an international character set
ESC U n	Set/Cancel unidirectional printing
ESC C 3 n	Select paper sensor to output paper-end signal (only for parallel interface model)
ESC C 4 n	Select paper sensor(s) to stop printing
ESC C 5 n	Enable/disable panel buttons
ESC d n	Print and feed n lines

ESC e n	Print and reverse feed n lines
ESC p m t1 t2	Cash drawer command
ESC t	Select character code table
GS (A PL PH n m	Execute test print
GS V m GS V m n	Feed paper for cutting position
GS r n	Transmit status
GS Z 0 t1 t2	Set on-line recovery wait time
FS ! n	Set print mode(s) for Chinese
FS &	Select Chinese mode
FS .	Cancel Chinese mode
FS 2 c1 c2 d1.....dk	Define user-defined Chinese characters
FS ? c1 c2	Cancel user-defined Chinese characters
FS S n1 n2	Set left-and right-side Chinese character spacing
FS W n	Turn quadruple-size mode on/off for Chinese characters
GS (F PL PH a m nL nH	Set black mark offset
GS FF	Feed black mark paper to printing started position

3.3 Printing command

3.3.1 Printing command

HT

Horizontal tab

Form	ASCII : HT
	DECIMAL: 9
	HEX: 09
Description	Printing position turn to the next horizontal tab position
	If present printing position over the last horizontal tab position, the HT command can' t be executed
	Horizontal tab position set by ESC D command

LF

Print and line feed

Form	ASCII : LF
	DECIMAL: 10

	HEX: 0A
Description	Prints the data in the print buffer and feeds one line, based on the current line spacing.

CR

Print and carriage return

Form	ASCII: CR
	DECIMAL: 13
	HEX: 0D
Description	Printing the data in the print buffer and dose not feed paper

DLE EOT n

Transmit real-time status

Form	ASCII: DLE EOT n																								
	DECIMAL: 16 4 n																								
	HEX: 10 04 n																								
Description	<p>Transmits the selected printer status specified by n in real time(Just for serial model), according to the following parameters:</p> <p>n = 1: Transmit printer status n = 2: Transmit offline status n = 3: Transmit error status n = 4: Transmit paper roll sensor status</p> <ul style="list-style-type: none"> ● When printer sending condition byte back, not consider the host computer allow sending date or not, That' s to say, not test interface DSR/CTS signal, sending at once when receiving the DLE EOT n order. ● This command is executed even when the printer is offline, the receive buffer is full, or there is an error status ● The specified definition of the relevant condition byte for different n number as the next tables. <p>n=1: Printer status</p> <table border="1"> <thead> <tr> <th rowspan="2">Bit</th><th rowspan="2">Function</th><th colspan="2">Datum OFF/ON</th></tr> <tr> <th>0</th><th>1</th></tr> </thead> <tbody> <tr> <td>0</td><td>Unused</td><td>0</td><td>---</td></tr> <tr> <td>1</td><td>Unused</td><td>---</td><td>1</td></tr> <tr> <td>2</td><td>Drawer kick-out signal</td><td>Drawer kick-out signal is low(connector pin 3)</td><td>Drawer kick-out signal is high(connector pin 3)</td></tr> <tr> <td>3</td><td>Off-line/On-line</td><td>On-line</td><td>Off-line</td></tr> </tbody> </table>			Bit	Function	Datum OFF/ON		0	1	0	Unused	0	---	1	Unused	---	1	2	Drawer kick-out signal	Drawer kick-out signal is low(connector pin 3)	Drawer kick-out signal is high(connector pin 3)	3	Off-line/On-line	On-line	Off-line
Bit	Function	Datum OFF/ON																							
		0	1																						
0	Unused	0	---																						
1	Unused	---	1																						
2	Drawer kick-out signal	Drawer kick-out signal is low(connector pin 3)	Drawer kick-out signal is high(connector pin 3)																						
3	Off-line/On-line	On-line	Off-line																						

4	Unused	---	1
5	Whether waiting on-line restored or not	Not waiting on-line restored	Waiting on-line restored
6	Undefined	---	---
7	Unused	0	---

n=2: Off-line status

Bit	Function	Datum OFF/ON	
		0	1
0	Unused	0	---
1	Unused	---	1
2	Undefined	---	---
3	Press key and feed paper	No feed paper	The processing of pressing key and feeding paper
4	Unused	---	1
5	Out of paper stop printing	With paper	Without paper stop printing
6	Error status	No error	Error occurred
7	Unused	0	---

n=3: n = 3: Error status

Bit	Function	Datum OFF/ON	
		0	1
0	Unused	0	---
1	Unused	---	1
2	Mechanical error	No mechanical error occurred.	Mechanical error occurred.
3	Cutter error	No cutter error	Cutter error occurs
4	Unused	---	1
5	Unrecoverable error	NO unrecoverable error	Unrecoverable error occurs
6	Automatic recover error	No automatic error	Automatic error
7	Unused	0	---

	n=4: Continuous paper sensor status		
	Bit	Function	Datum OFF/ON
			0 1
	0	Unused	0 ---
	1	Unused	--- 1
	2 . 3	Paper near-end sensor	With paper Paper near end.
	4	Unused	--- 1
	5 . 6	Paper end sensor	With paper Without paper
	7	Unused	0 ---

DLE ENQ n

Real-time request to printer

Form	ASC II: DLE ENQ n
	DECIMAL: 16 5 n
	HEX: 10 05 n
Description	<p>This command only effects to D5000 serial model, when receiving this command, according to n parameter stipulation and answer the host computer' s operational request.</p> <p>Parameter n took number 0, 2</p> <p>n=0: Restore on-line condition</p> <p>n=2: Clear received buffer area and printing buffer area, then restart.</p> <ul style="list-style-type: none"> ● When receiving this order, answer and execute. ● Only at the process of “wait on-line condition” which set paper by itself, this order(n=0) will be executed, the other condition doesn' t answer this order(n=0). ● Only happened cutter fault, black mark fault, this order(n=2) will be executed, the other condition doesn' t answer this command(n=2).

ESC SP n

Set right-side character spacing

Form	ASC II: ESC SP n
	DECIMAL: 27 32 n
	HEX: 1B 20 n
Description	Sets the character spacing for the right side of the

	character to {n*0.125mm} n=0~255 Windows default n=0.
--	---

ESC ! n

Select character print mode(s)

Form	ASCII: ESC ! n		
	DECIMAL: 27 33 n		
	HEX: 1B 21 n		
Description	Selects print mode(s) using n as follows:		
	Dot	Function	Datum
			0 1
	0	Character model chosen	5×7 7×7
	1	Undefined	
	2	Undefined	
	3	Undefined	
	4	Double height	Cancel Set
	5	Double width	Cancel Set
	6	Undefined	
	7	Underline	Cancel Set
	Window default n=0, choose 5×7 dot, normal character, no underline.		

Esc % n

Select/cancel user-defined character set

Form	ASCII: Esc % n		
	DECIMAL: 27 37 n		
	HEX: 1B 25 n		
Description	When n=<*****1>B, Choose user-defined character set. When n=<*****0>B, Choose interior character set. 0≤n≤255, Window default n=0.		

ESC &

Define user-defined character

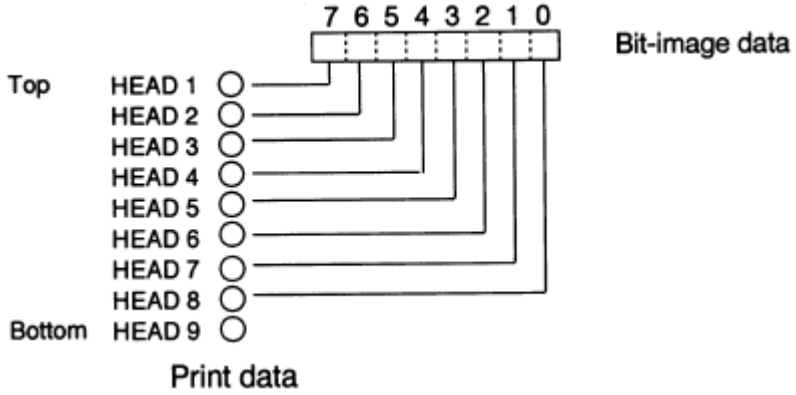
Form	ASCII: ESC & S n m (a (p) s×a) m—n+1
------	--------------------------------------

Description	DECIMAL: 27 38 S n m (a (p) s×a) m−n+1
	HEX: 1B 26 S n m (a (p) s×a) m−n+1
	ESC & use to define user-defined m−n+1 character.
	S specifies the number of bytes in the vertical direction s=1; n specifies the beginning character code for the definition
	m specifies the final code, when only one character is desired, use n=m, The range of definable character codes extends from <20>H to <7E>H, maximum define 95 user-defined character. $32 \leq n \leq m \leq 126$
	a indicated user-defined character model at the level directional dot, $0 \leq a \leq 6(5 \times 7 \text{dot})$, $0 \leq a \leq 10(7 \times 7 \text{dot})$. The defined downloaded characters are cleared in the following circumstances: 1. When ESC @ is executed 2. When deleted by ESC ? 3. When the printer is reset or turned off.

ESC *

Select bit-image mode

Form	ASCII: ESC * m n1 n2 (d) n1+256×n2
	DECIMAL: 27 42 m n1 n2 (d) n1+256×n2
	HEX: 1B 2A m n1 n2 (d) n1+256×n2
Description	<p>Selects a bit-image mode using m for the number of dots specified by n1 and n2.</p> <p>m=0, 1 $0 \leq n1 \leq 255$, $0 \leq n2 \leq 1$, $0 \leq d \leq 255$.</p> <p>The bit-image modes selectable by m are as follows.</p> <p>m=0, Choose normal printing, maximum printing dot is 210(42CPL)/200(40CPL).</p> <p>m=1, Choose half dots printing, maximum printing dot is 420(42CPL)/400(40CPL).</p> <p>(d) k is dot datum, the relevant number is 1, print this dot; (d) k is dot datum, the relevant number is 0, not print this dot. The definition of d is:</p>

	 <p>Allow dot and character mixed line printing, if the dot datum sent over the biggest printing dot of one line, the over part will be neglected.</p>
--	--

ESC – n

Turn underline mode on/off

Form	ASC II : ESC – n
	DECIMAL : 27 45 n
	HEX : 1B 2D n
Description	When n = 0 or 48, underline mode is turned off. When n = 1 or 49, underline mode is turned on.

ESC 2

Set character line spacing 1/6 inch

Form	ASC II : ESC 2
	DECIMAL : 27 50
	HEX : 1B 32
Description	Set row spacing 1/6 inch

ESC 3 n

Set character line spacing n/144 inch

Form	ASC II : ESC 3 n
	DECIMAL : 27 51 n
	HEX : 1B 33 n
Description	Sets the line spacing n/144 feet. n=0~255. Default n=24(1/6 inch)

ESC ? n

Cancel user-defined character

Form	ASCII: ESC ? n
	DECIMAL: 27 63 n
	HEX: 1B 3F n
Description	Cancel user-defined character

ESC @

Initialize printer

Form	ASCII: ESC @
	DECIMAL: 27 64
	HEX: 1B 40
Description	ESC @ command initialization printer, the content as follows: Clear data in the print buffer; Resets the printer mode to the mode that was in effect when the power was turned on.

ESC D

Set horizontal tab position

Form	ASCII: ESC D (n) k NUL
	DECIMAL: 27 68 (n) k 0
	HEX: 1B 44 (n) k 00
Description	<p>n specifies the column number for setting a horizontal tab position.</p> <p>K=1 ~ 32.k indicates the total number of horizontal tab positions to be set.</p> <p>All position needed to be set in the allowed line width, choose 5*7 dot pattern, the maximum of n is 35, choose character 7*7 dot pattern, the maximum of n is 42.</p> <p>Level table position stored, according to the present character(5 × 7dot, 7 × 7dot) pattern(contains character distance), and counted to absolute dot position, So, the width of double wide character is two times than usual character width. After executing ESC D order, change the type and size of character no affect the position of set list again, assure that character and character line mixed or character transverse enlargement and decrease, the list always in good order when using it.</p> <p>NUL add in the end, indicates that this order have finished,</p>

	<p>ESC D NUL order clear all level table position, then the HT order executed will no effect.</p> <p>Window default is 8、16、24、32(character chosen 7×7 dot pattern)</p> <p>Note: Must be $(n) k > (n) (k-1)$, if $(n) k < (n) (k-1)$, printer thought that this order have finished, the latest order parameter will be thought the normal printing datum.</p>
--	--

ESC J n

Print and feed paper n/144 inches

Form	ASCII: ESC J n
	DECIMAL: 27 74 n
	HEX: 1B 4A n
Description	<p>Print the data in the print buffer and feeds the paper n/144($n \times 0.176$ mm).</p> <p>n=0~255</p> <p>The order only effects to print this line, not change the line spacing datum which set by ESC2, ESC3 order.</p>

ESC K n

Print and reverse feed paper n/144 inches

Form	ASCII: ESC K n
	DECIMAL: 27 75 n
	HEX: 1B 4B n
Description	<p>Print the data in the print buffer and feeds the paper n/144 in the reverse direction($n \times 0.176$ mm).</p> <p>n=0~48</p>

ESC R n

Select an international character set

Form	ASCII: ESC R n
	DECIMAL: 27 82 n
	HEX: 1B 52 n
Description n	<p>ESC R be used to choose different ASC II character set of 11 different countries.</p> <p>n=0~10, Default is 0, choose U.S.A pattern.</p>

	国 名	ASCII code (hexadecimal)											
		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	U.S.A	#	\$	@	[\]	^	`	{		}	~
1	France	#	\$	à	•	ç	\$	^	`	é	ù	è	“
2	Germany	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	U.K	£	\$	@	[\]	^	`	{		}	~
4	Denmark I	#	\$	@	Æ	Ø	À	^	`	æ	ø	À	~
5	Sweden	#	¤	É	Ä	Ö	À	Ü	é	ä	ö	À	ü
6	Italy	#	\$	@	•	\	é	^	à	à	ò	è	ì
7	Spain	Pt	\$	@	ı	Ñ	ı	ˆ	ˆ	ˆ	ñ	}	~
8	Japan	#	\$	@	[¥]	ˆ	ˆ	{		}	~
9	Norway	#	¤	É	Æ	Ø	À	Ü	é	æ	ø	À	ü
10	Denmark II	#	\$	É	Æ	Ø	À	Ü	é	æ	ø	À	ü

ESC U n

Turn unidirectional printing mode on/off

Form	ASCII: ESC U n
	DECIMAL: 27 85 n
	HEX: 1B 55 n
Description	<p>Turn unidirectional printing mode on/off. n=0 ~ 255, only effects to the lowest bit.</p> <p>n=<XXXXXX1>B, turn on unidirectional printing mode and turn on bidirectional printing mode.</p> <p>n=<XXXXXX0>B, turn off unidirectional printing mode.</p> <p>Window default n=0</p> <p>Note: At the bidirectional printing, the printing speed is quicker one time than the unidirectional printing, but may happen the phenomenon of up and down in bad order, This is led by printer' s theory, belongs to normal phenomenon.</p>

ESC c 3 n

Select paper detector(s) to output paper end signals

Form	ASCII: ESC c 3 n
------	------------------

	DECIMAL: 27 99 51 n																																																													
	HEX: 1B 63 33 n																																																													
Description	Selects paper detector(s) to output paper end signals, using n as follows: <table><tr><th>Bit</th><th>Off/On</th><th>Hex</th><th>Decimal</th><th>Function</th></tr><tr><td rowspan="2">0</td><td>Off</td><td>00</td><td>0</td><td>Paper roll near end sensor disabled.</td></tr><tr><td>On</td><td>01</td><td>1</td><td>Paper roll near end sensor enabled.</td></tr><tr><td rowspan="2">1</td><td>Off</td><td>00</td><td>0</td><td>Paper roll near end sensor disabled.</td></tr><tr><td>On</td><td>02</td><td>2</td><td>Paper roll near end sensor enabled.</td></tr><tr><td rowspan="2">2</td><td>Off</td><td>00</td><td>0</td><td>Paper roll end detector disabled.</td></tr><tr><td>On</td><td>04</td><td>4</td><td>Paper roll end detector enabled.</td></tr><tr><td rowspan="2">3</td><td>Off</td><td>00</td><td>0</td><td>Paper roll end detector disabled.</td></tr><tr><td>On</td><td>08</td><td>8</td><td>Paper roll end detector enabled.</td></tr><tr><td>4</td><td>-</td><td>-</td><td>-</td><td>Undefined</td></tr><tr><td>5</td><td>-</td><td>-</td><td>-</td><td>Undefined</td></tr><tr><td>6</td><td>-</td><td>-</td><td>-</td><td>Undefined</td></tr><tr><td>7</td><td>-</td><td>-</td><td>-</td><td>Undefined</td></tr></table> <p>The switch of paper will be exhausted which can be chosen, when not set this switch, the printer won't send the signal of paper will be ended.</p> <p>Window default is n=<****1111>B.</p>	Bit	Off/On	Hex	Decimal	Function	0	Off	00	0	Paper roll near end sensor disabled.	On	01	1	Paper roll near end sensor enabled.	1	Off	00	0	Paper roll near end sensor disabled.	On	02	2	Paper roll near end sensor enabled.	2	Off	00	0	Paper roll end detector disabled.	On	04	4	Paper roll end detector enabled.	3	Off	00	0	Paper roll end detector disabled.	On	08	8	Paper roll end detector enabled.	4	-	-	-	Undefined	5	-	-	-	Undefined	6	-	-	-	Undefined	7	-	-	-	Undefined
Bit	Off/On	Hex	Decimal	Function																																																										
0	Off	00	0	Paper roll near end sensor disabled.																																																										
	On	01	1	Paper roll near end sensor enabled.																																																										
1	Off	00	0	Paper roll near end sensor disabled.																																																										
	On	02	2	Paper roll near end sensor enabled.																																																										
2	Off	00	0	Paper roll end detector disabled.																																																										
	On	04	4	Paper roll end detector enabled.																																																										
3	Off	00	0	Paper roll end detector disabled.																																																										
	On	08	8	Paper roll end detector enabled.																																																										
4	-	-	-	Undefined																																																										
5	-	-	-	Undefined																																																										
6	-	-	-	Undefined																																																										
7	-	-	-	Undefined																																																										

ESC c 4 n

Select paper sensor(s) to stop printing

Form	ASCII: ESC c 4 n
	DECIMAL: 27 99 52 n
	HEX: 1B 63 34 n
Description n	Selects the paper sensor(s) to use to stop printing when a paper-end is detected, using n as follows :

Bit	Off/On	Hex	Decima l	Function
0	Off	00	0	Paper roll near-end sensor disabled.
	On	01	1	Paper roll near-end sensor enabled.
1	Off	00	0	Paper roll near-end sensor disabled.
	On	02	2	Paper roll near-end sensor enabled.
2	-	-	-	Undefined
3	-	-	-	Undefined
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	-	-	-	Undefined

Only needs that one bit is 1 between the bit 0 and bit 1, so permit that the detector which means paper will be ended, when stop printing, it always effects.

The switch means that paper will be ended, it can be chosen, When not press this switch and the order set switch stop printing, printer won' t be answered. Window default is n=<*****00>B.

ESC c 5 n

Enable/disable panel buttons

Form	ASCII: ESC c 5 n
	DECIMAL: 27 99 53 n
	HEX: 1B 63 35 n
Description	<p>Enable/disable the panel buttons.</p> <p>n=0~255. Only the lowest bit effects.</p> <p>When n=<*****0>B, the panel button is enabled.</p> <p>When n=<*****1>B, the panel button is disabled.</p> <p>Default n=0.</p>

ESC d n

Print and feed paper n character line

Form	ASCII: ESC d n
	DECIMAL: 27 100 n
	HEX: 1B 64 n
Description	Print the date in the print buffer and feeds the paper n character line, n=0~255.

ESC e n

Print and reverse feed paper n character lines

Form	ASCII: ESC e n
	DECIMAL: 27 101 n
	HEX: 1B 65 n
Description	Print the data in the print buffer and reverse feed the paper n character line. n=0~2 and the maximum reverse feeding distance is 48 dot(48×0.176 mm).

ESC p m t1 t2

Cash drawer command

Form	ASCII: ESC p m t1 t2
	DECIMAL: 27 112 m t1 t2
	HEX: 1B 65 m t1 t2
Description	<p>Outputs the cash drawer specified by t1 and t2 to connector pin m as follows(need $t2 \geq t1$).</p> <p>m=0, 48 Output at the cash drawer pin 2. m=1, 49 Output at the cash drawer pin 5.</p> <p>Notes: If $t2 < t1$, printer deal with $t2 = t1 \times 2$ms If $t2 < 50$, within paper set t2 to 50</p>

ESC t n

Select character set

Form	ASCII: ESC t n
	DECIMAL: 27 116 n
	HEX: 1B 74 n
Description	Select character set 0 or 1. n=0~1. Window default n=0, Select character set 0(IBM character set 2)

GS (A PL PH n m

Execute test print

Form	ASCII: GS (A PL PH n m
	DECIMAL: 29 40 65 PL PH n m
	DECIMAL: 1D 28 41 PL PH n m

Description	PL=2, PH=0 n=0, 1, 2, 48, 49, 50 m=1, 49 When m=1, 49 executing hex printing mode
-------------	--

GS V m

GS V m n

Feeds paper for cutting position

Form	ASC II: GS V m
	DECIMAL: 29 86 m
	HEX: 1D 56 m
	ASC II: GS V m n
	DECIMAL: 29 86 m n
	HEX: 1D 56 m n
Description	<p> $0 \leq n \leq 255$ When m=0, 1, 48, 49, printer executes direct cutting paper pattern. (full or partial cut). When m=66, Feeds paper for (cutting position + $[n \times 0.176 \text{ mm} \{1/144 \text{ inches}\}]$), and cut(full or partial cut). ● Execute full or partial cut depends on DIP set. ● This command is effective only at the beginning of a line. ● Choose black mark position effecting, when execute GS V 66 command, n no effects, the distance of feeding paper depends on the parameter of GS (F order command). </p>

GS r n

Transmit status

Form	ASC II: GS r n
	DECIMAL: 29 114 n
	HEX: 1D 72 n
Description	Transmits the status specified by n as follow (only for serial printer).

	<table><tr><td>n</td><td>Function</td></tr><tr><td>1, 49</td><td>Transmit paper sensor status.</td></tr><tr><td>2, 50</td><td>Transmit drawer kick-out connector status</td></tr></table>	n	Function	1, 49	Transmit paper sensor status.	2, 50	Transmit drawer kick-out connector status																				
n	Function																										
1, 49	Transmit paper sensor status.																										
2, 50	Transmit drawer kick-out connector status																										
Paper sensor status(n=1, 49)																											
Bit	<table><tr><td>Condition</td><td colspan="2">Datum off/on</td></tr><tr><td></td><td>0</td><td>1</td></tr><tr><td>0, 1</td><td>Paper near end sensor</td><td>Paper present</td><td>Paper near end</td></tr><tr><td>2, 3</td><td>Paper end sensor</td><td>Paper present</td><td>No Paper present</td></tr><tr><td>4</td><td>Unused</td><td>0</td><td>---</td></tr><tr><td>5, 6</td><td>Undefined</td><td>---</td><td>---</td></tr><tr><td>7</td><td>Unused</td><td>0</td><td>---</td></tr></table>	Condition	Datum off/on			0	1	0, 1	Paper near end sensor	Paper present	Paper near end	2, 3	Paper end sensor	Paper present	No Paper present	4	Unused	0	---	5, 6	Undefined	---	---	7	Unused	0	---
Condition	Datum off/on																										
	0	1																									
0, 1	Paper near end sensor	Paper present	Paper near end																								
2, 3	Paper end sensor	Paper present	No Paper present																								
4	Unused	0	---																								
5, 6	Undefined	---	---																								
7	Unused	0	---																								
The drawer kick-out connector status(n=2, 50)																											
Bit	<table><tr><td>Condition</td><td colspan="2">Datum off/on</td></tr><tr><td></td><td>0</td><td>1</td></tr><tr><td>0</td><td>Drawer kick-out connector pin 3</td><td>LOW</td><td>HIGH</td></tr><tr><td>1, 2, 3</td><td>Undefined</td><td>---</td><td>---</td></tr><tr><td>4</td><td>Unused</td><td>0</td><td>---</td></tr><tr><td>5, 6</td><td>Undefined</td><td>---</td><td>---</td></tr><tr><td>7</td><td>Unused</td><td>0</td><td>---</td></tr></table>	Condition	Datum off/on			0	1	0	Drawer kick-out connector pin 3	LOW	HIGH	1, 2, 3	Undefined	---	---	4	Unused	0	---	5, 6	Undefined	---	---	7	Unused	0	---
Condition	Datum off/on																										
	0	1																									
0	Drawer kick-out connector pin 3	LOW	HIGH																								
1, 2, 3	Undefined	---	---																								
4	Unused	0	---																								
5, 6	Undefined	---	---																								
7	Unused	0	---																								
<p>When printer test that the host computer DSR signal is effective, will upload condition byte, Or, wait forever.</p> <p>The host computer send this command means downloading to printer received buffer, waiting for printer command explained execution. So the time of printer uploading condition may longer than receiving this order and uploading condition.</p> <p>Internal time relate to how much date which in the printer received buffer that waited to deal with, and needed to execute relevant operation.</p>																											

GS z 0 t1 t2

Setting of online recovery wait time

Form	ASCII: GS z 0 t1 t2
	DECIMAL: 29 122 48 t1 t2

	HEX: 1D 7A 30 t1 t2
Description	<div> <p>Paper loaded/out of paper</p> <p>Loading operation</p> <p>Printing operation</p> <p>"Out of paper" detected</p> <p>Paper loading wait time (t1 500 ms)</p> <p>Recovery confirmation (t2 500 ms)</p> <p>On-line recovery wait time</p> <ul style="list-style-type: none"> ● At the waiting time($t1 \times 500\text{ms}$) of packing paper, light turned off when paper-ended, can press key to feed paper, and its time not calculate at the waiting time. ● At the period of assuring restore($t2 \times 500\text{ms}$), light will glimmer when paper-ended, can press key and retreat this period. <p>At this period, the printer answer the host computer' s real-time question DLE ENQ N.</p> </div>

FS ! n

Set print mode for Chinese characters

Form	ASCII: FS ! n																								
	DECIMAL: 28 33 n																								
	HEX: 1C 21 n																								
Description	<p>Using n as follows:</p> <table border="1"> <thead> <tr> <th rowspan="2">Bit</th><th rowspan="2">Function</th><th colspan="2">Datum</th></tr> <tr> <th>0</th><th>1</th></tr> </thead> <tbody> <tr> <td>0, 1</td><td>Undefined</td><td>---</td><td>---</td></tr> <tr> <td>2</td><td>Double width printing</td><td>Cancel</td><td>Set</td></tr> <tr> <td>3</td><td>Double height printing</td><td>Cancel</td><td>Set</td></tr> <tr> <td>4, 7</td><td>Undefined</td><td>---</td><td>---</td></tr> </tbody> </table> <p>Default n=0</p>			Bit	Function	Datum		0	1	0, 1	Undefined	---	---	2	Double width printing	Cancel	Set	3	Double height printing	Cancel	Set	4, 7	Undefined	---	---
Bit	Function	Datum																							
		0	1																						
0, 1	Undefined	---	---																						
2	Double width printing	Cancel	Set																						
3	Double height printing	Cancel	Set																						
4, 7	Undefined	---	---																						

FS &

Select Chinese characters mode

Form	ASCII: FS &
	DECIMAL: 28 38

	HEX: 1C 26
Description	<p>Printer received this command, select Chinese characters mode.</p> <p>At the Chinese printing pattern, the Chinese code of printer received that is 2 byte's standard within the host computer code. According to this code, search for the hard Chinese model of printer, and print international standard 15×16 dot Chinese.</p> <p>The scale of double Chinese within the host computer code as follows:</p> <p>The first byte: A1H~A6H, B0H~F7F</p> <p>The second byte: A1H~FEH</p> <p>Printer received the ASCII code(20H-9FH) of single byte, will print relevant 5×7 or 7×7 dot character.</p> <p>Under the Chinese pattern, can use ESC ! order and set western character printing pattern.</p> <p>Notes: Firstly need to use ESC U order to choose single printing pattern, the effect of printing Chinese will be better.</p>

FS.

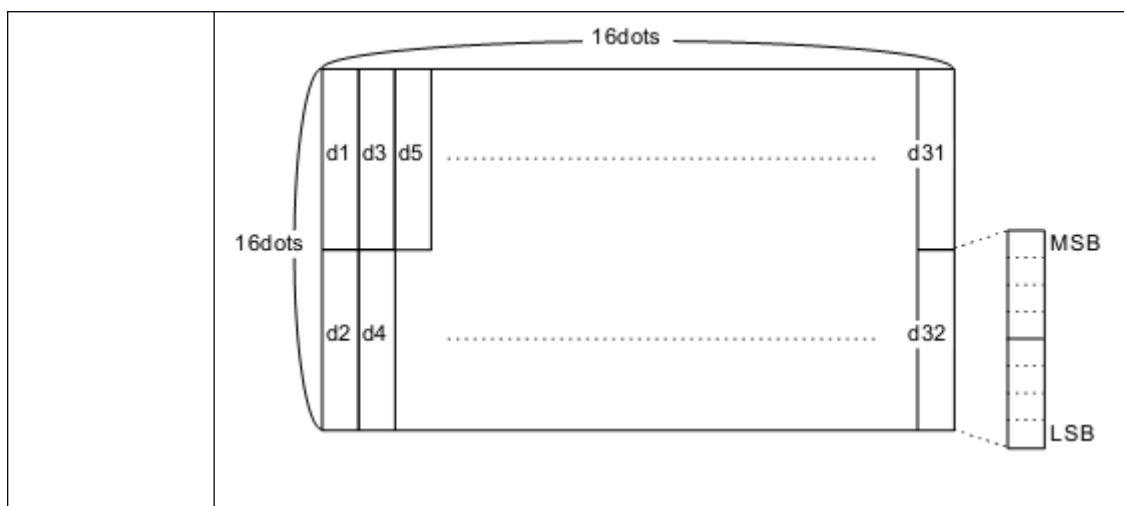
Cancel Chinese mode

Form	ASCII: FS.
	DECIMAL: 28 46
	HEX: 1C 2E
Description	When Chinese mode is not selected, all character codes are processed one byte at a time as ASCII code.

FS 2 c1 c2 d1...dk

Define user-defined Chinese

Form	ASCII: FS 2 c1 c2 d1...dk
	DECIMAL: 28 50 c1 c2 d1...dk
	HEX: 1C 32 c1 c2 d1...dk
Description	<p>c1=FEH</p> <p>c2=A1h~FEH</p> <p>k=32</p> <ul style="list-style-type: none"> ● c1, c2 indicates user-defined Chinese code. ● Datum Form.



FS ? c1 c2

Cancel user-defined Chinese

Form	ASCII: FS ? c1 c2
	DECIMAL: 28 63 c1 c2
	HEX: 1C 3F c1 c2
Description	c1=FEH c2=A1H~FEH

FS S n1 n2

Set Chinese left and right side spacing

Form	ASCII: FS S n1 n2
	DECIMAL: 28 83 n1 n2
	HEX: 1C 53 n1 n2
Description	n1=0~32 Set Chinese left spacing n2=0~32 Set Chinese right spacing Window default n1=0, n2=0

FS W n

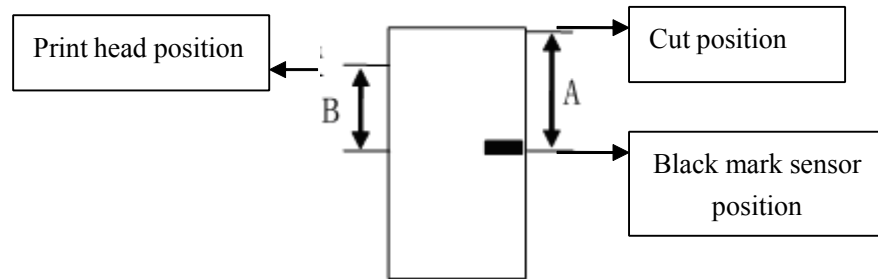
Set/cancel Chinese quadruple-size mode

Form	ASCII: FS W n
	DECIMAL: 28 87 n
	HEX: 1C 57 n
Description	The lowest n is 0, cancel Chinese quadruple-size mode The lowest n is 1, set Chinese quadruple-size mode Default n=0`

GS (F pL pH a m nL nH

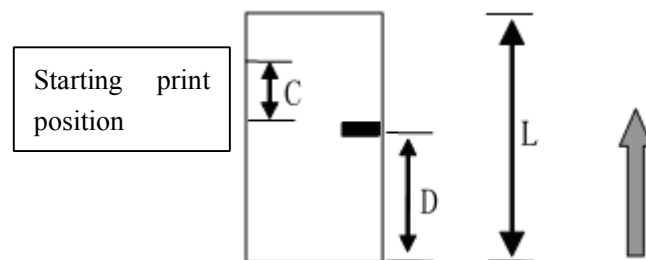
Set adjustment value

Form	ASCII: GS (F pL pH a m nL nH						
	DECIMAL: 29 40 70 pL pH a m nL nH						
	HEX: 1D 28 46 pL pH a m nL nH						
Description	<p>This command is effective only when the black model sensor is enabled.</p> <p>Sets adjustment values(s) for the printer operations specified by a.</p> <p>Order relevant parameter as follows: $pL + (pH \times 256) = 4$; That's to say, $pL = 4$, $pH = 0$. $1 \leq a \leq 2$ $m = 0, 48 \text{ or } 1, 49$ $n \leq (nL + nH \times 256) < 1700$</p> <p>a specifies setting values for the positions to start printing and cutting.</p> <table border="1"> <thead> <tr> <th>a</th><th>Function</th></tr> </thead> <tbody> <tr> <td>1</td><td>Setting value for the positions to start the printing.</td></tr> <tr> <td>2</td><td>Setting value for the positions to start the cutting.</td></tr> </tbody> </table> <ul style="list-style-type: none"> ● $m = 0$ or 48, Specifies a forward paper feeding direction ● $m = 1, 49$, Specifies a backward paper feeding direction. ● nL and nH specifies the setting value to $(nL + nH \times 256) \times 0.176 \text{ mm}$. ● Only executing this order, the relevant black mark position operation of GS FF and GS V order is effect. ● When executing GS FF order, set started printing position offset(a=1) is effect. ● When executing GS V m order, set cut/tear paper position offset(a=2) is effect. <p>b. Illustration about cutting/tearing paper position offset and starting printing position offset.</p> <p>① Fixed parameter illustration.</p>	a	Function	1	Setting value for the positions to start the printing.	2	Setting value for the positions to start the cutting.
a	Function						
1	Setting value for the positions to start the printing.						
2	Setting value for the positions to start the cutting.						



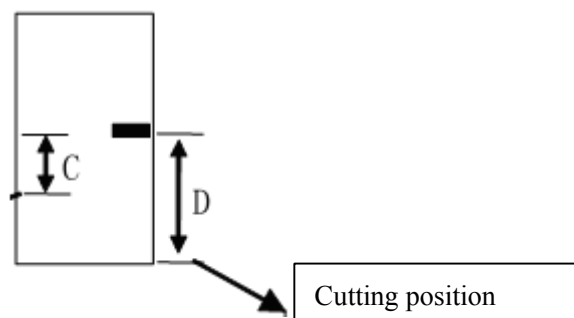
- The distance A between black mark detector and cutting paper line is 45 mm.
- The distance A between black mark detector and the head of printing is 28 mm.

② When the head line printing position at the front of the black mark.



- Start printing position offset (the parameter of $a=1$) is $L - C + B$.
- Tear position offset (the parameter of $a=1$) is $D + A$.

③ When the head line printing position at the behind of the black mark.



	<ul style="list-style-type: none"> ● Start printing position offset(the parameter of a=1) is C+B. ● Tear position offset(the parameter of a=1) is D+A. <p>④ Notes: The unit of above A、B、C、D、L is mm, transform to GS CF' s nl, nh need to divide into 0.176.</p> <p>Notes: When calculate black mark offset parameter, if offset over the length L of printing single bill, need to decrease with L, until the final offset is not more than L, Or, the position will be wrong.</p> <p>⑤ The order of programming is:</p> <ol style="list-style-type: none"> 1. GS(F order set the parameter of a=1, a=2) 2. GS FF paper head to start printing position 3. Printing the content of bill 4. GS V 66 send/tear paper position 5. Repeat 2、3、4.
--	---

GS FF

Feed black mark paper to printing started position

Form	ASCII: GS FF
	DECIMAL: 29 12
	HEX: 1D 0C
Description	<p>This order only effects on the black mark control permit conditions.</p> <p>Test black mark and feed paper to GS (F (a=1) order set which assured printing started position.</p> <p>When black mark at the present printing started position, not execute feeding paper operation.</p> <p>With cutter and cutter set by half pattern, the printer won' t be executed reverse feed paper.</p>