TG2480

USER MANUAL

PRINTER COMPONENTS

1 Near paper end sensor	11 Metal chassis
2 Paper roll holder support	12 Cutter group
3 Paper width adjustment	13 Print head
4 Near paper end sensor adjustment	14 Inspection door
5 Unblocking lever for cutter unit	15 Paper mouth
6 Rubbed roller manual feed	16 Ticket withdrawal sensor
7 Unblocking lever for rubbed roller	17 Interface connector (USB or RS232)
8 PRINT key	18 Status LED
9 FEED key	19 Power supply connector
10 Paper jam sensor	20 Paper in

(Fig.1)

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MANUAL CONTENTS

In addition to the Introduction which includes a description of the explanatory notes used in the manual, general safety information, how to unpack the printer and a brief description of the printer including its basic features, this manual is organized as follows:

Chapter 1:   Contains the information required for correct printer installation and its proper use
Chapter 2:   Contains information on interface specifications
Chapter 3:   Contains a description of the printer command set
Chapter 4:   Contains Technical Specifications of the printer
Chapter 5:   Contains the character sets (fonts) used by the printer

EXPLANATORY NOTES USED IN THIS MANUAL

N.B.
Gives important information or suggestions relative to the use of the printer.

WARNING
Information marked with this symbol must be carefully followed to guard against damaging the printer.

DANGER
Information marked with this symbol must be carefully followed to guard against operator injury or damage.

GENERAL SAFETY INFORMATION

• Read and keep the instructions which follow.
• Follow all warnings and instructions indicated on the printer.
• Before cleaning the printer, disconnect the power supply.
• Clean the printer with a damp cloth. Do not use liquid or spray products.
• Do not operate the printer near water.
• Do not use the printer on unstable surfaces that might cause it to fall and be seriously damaged.
• During the integration of the printer, we strongly warn to keep an adeguate paper loop outlet underneath the presenter, in order to allow the receipt being properly printed out.
• Only use the printer on hard surfaces and in environments that guarantee proper ventilation.
• Make sure the printer is placed in such a way as to avoid damage to its wiring.
• Use the type of electrical power supply indicated on the printer label. If in doubt, contact your retailer.
• Do not block the ventilation openings.
• Do not introduce foreign objects of any kind into the printer as this could cause a short circuit or damage parts that could jeopardize printer functioning.
• Do not spill liquids onto the printer.
• Do not carry out technical operations on the printer, with the exception of the scheduled maintenance procedures specifically indicated in the user manual.
• Disconnect the printer from the electricity supply and have it repaired by a specialized technician when:
    A.   The feed connector has been damaged.
    B.   Liquid has seeped inside the printer.
    C.   The printer has been exposed to rain or water.
    D.   The printer is not functioning normally despite the fact that all instructions in the users manual have been followed.
    E.   The printer has been dropped and its outer casing damaged.
    F.   Printer performance is poor.
    G.   The printer is not functioning.

UNPACKING THE PRINTER

Remove the printer from its carton being careful not to damage the packing material so that it may be re-used if the printer is to be transported in the future. Make sure that all the components illustrated below are present and that there are no signs of damage. If there are, contact Customer Service.

1. User manual
2. Installation instructions
3. Paper roll
4. Power supply cable (2 ways)
5. Printer
6 protection packing shell
7. Box
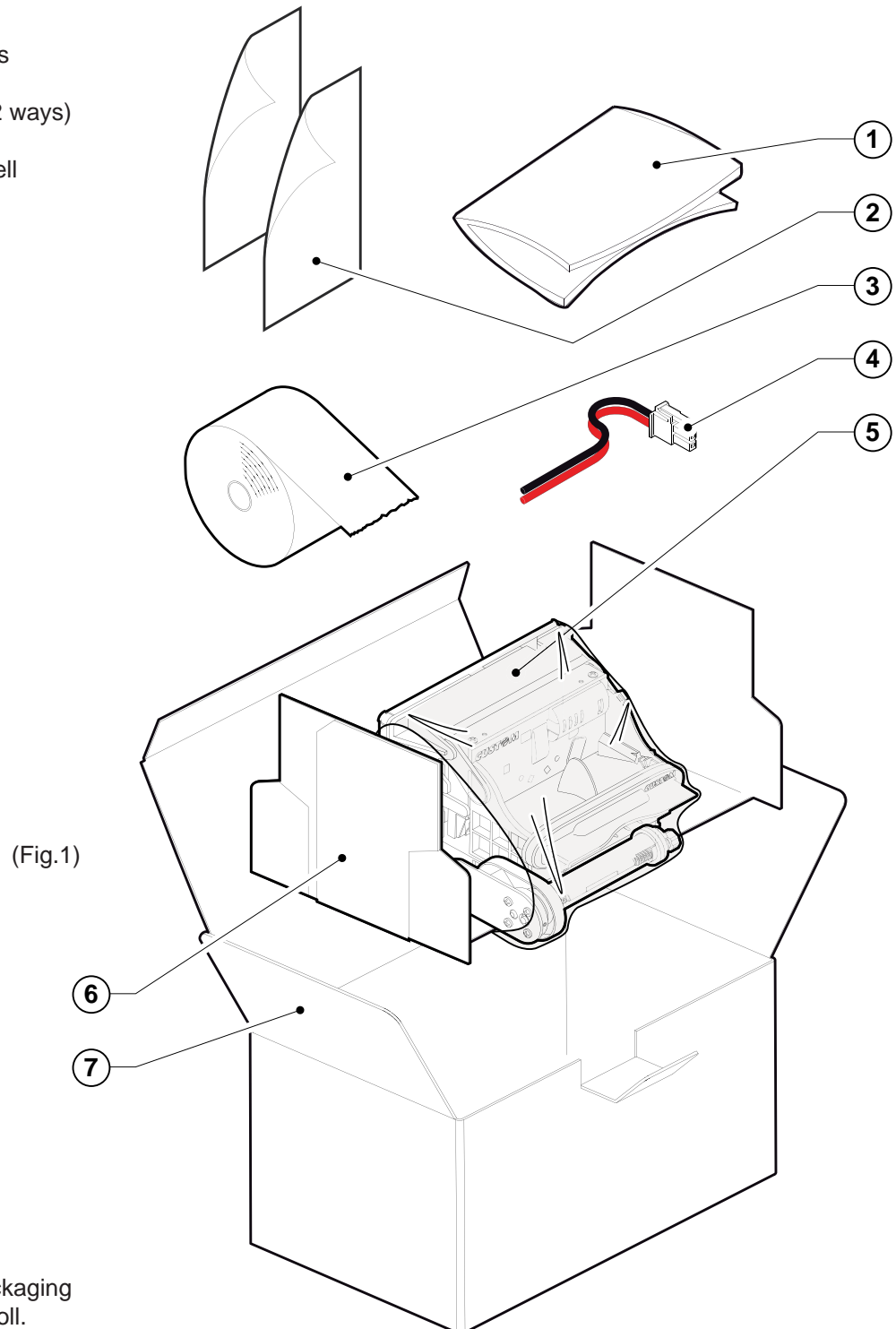
(Fig.1)

- Open the printer packaging
- Take out the paper roll.
- Take out the user manual and the installation instructions.
- Take out the power supply cable.
- Lift the protection packing shell and take out the printer.
- Keep the box packing materials in the event the printer must be transported/shipped in the future

CUSTOM

GENERAL FEATURES

Thermal printer for dispensing 80 mm tickets width, easy to install (3 fastening holes and ticket presentation to user incorporated). Thanks to the exclusive anti-paper-jam system, the ticket will always be promptly dispensed to the user. Thanks to an innovative type of paper roll holding bracket, it is possible to accommodate up to 73 metres of paper (max external Ø 80mm).
In addition to normal printing function, the printer offers a wide array of special features:

- Fast (>140mm/sec) ticket dispenser,
- Printing with extremely high graphic quality (resolution 204dpi).
- Autoload system.
- Integrated Auto-cutter.
- Paper dispense restriction device
- Accommodates paper thickness from 60 to 120 gr/m^2 (also labels with Ø$_{MAX}$=100mm).
- Adjustable paper roll holder
- 24V power supply.
- USB or RS232 interface.
- Near paper end sensor, paper jam, ticket withdrawal sensor.

PRINTER DESCRIPTION

The printer has an ABS casing with paper roll holder and a rotating paper mouth unit which opens to allow access to print head. The control panel is located on the right side and has a PRINT key, a FEED key and status LED.

- PRINT key   When the PRINT key is pressed, the printer perform a demo ticket with pre-set length. During power-up, if the PRINT key is held down, the printer will perform the GRAPHIC TEST.
- FEED key   When the FEED key is pressed, the printer advances the paper. During power-up, if the FEED key is held down, the printer will perform the FONT TEST routine.
- PRINT+FEED key When both the PRINT and the FEED keys are pressed during printer power up, it prints the SETUP report. Pressing the PRINT key it's possible to change the parameters value and to print the parameter current value; pressing the FEED key it's possible to pass to the next parameter till the end of the SETUP.
- STATUS LED   STATUS LED displays printer hardware status. In case of malfunction, flash frequency changing as follows:

(Tab.1)

STATUS LED	COLOUR	DESCRIPTION		
○	OFF	Printer OFF		
●	ON	Printer ON: no error		
☀	FLASHING	**RECOVERABLE ERROR**		
		Slow	Rotating cover open	
		Fast	Paper end	

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1.1 CONNECTIONS

1.1.1 Power Supply

(Fig.1.1)
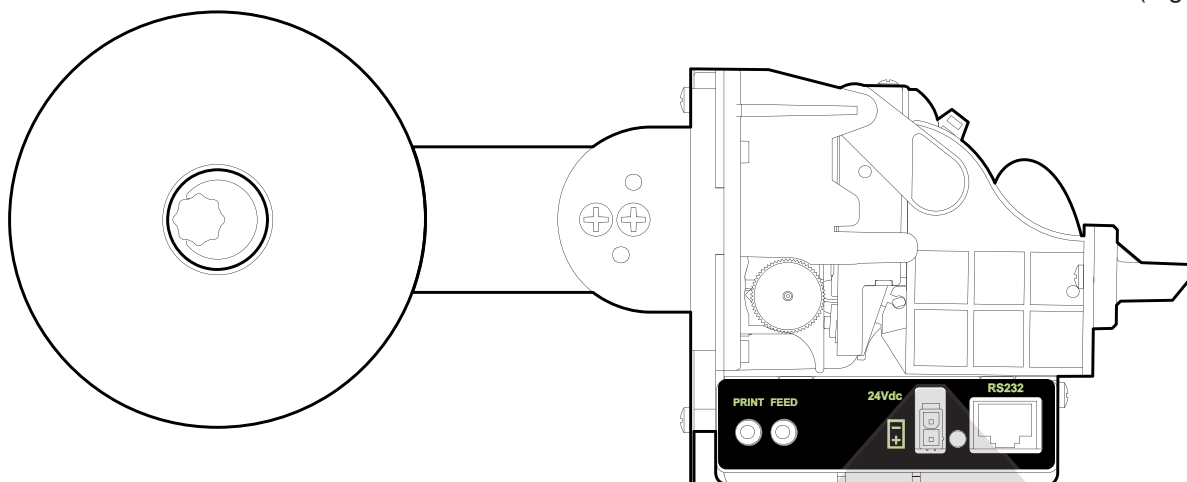
The printer is equipped with a 2 pin male molex connector series 5569 (Vertical), for the power supply (see Fig. 1.1). The connector pin configuration is as follows:

PIN	COLOUR	SIGNAL	DESCRIPTION
1	RED	+24 V	Power supply
2	BLACK	GND	Ground signal
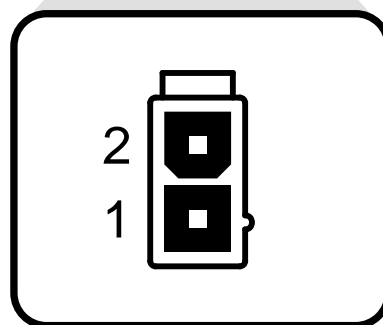
Model no. type: Header :   90° Molex series 5569 (no. 39-30-1020)
                                     Housing :   Molex series 5557 (no. 39-01-3022)

This picture shows the power supply cable included in the printer packaging:

(Fig.1.2)

MOLEX FEMALE
CONNETTOR 2 PIN

OPPOSITE VIEW
SIDE OF CABLE INSERTION
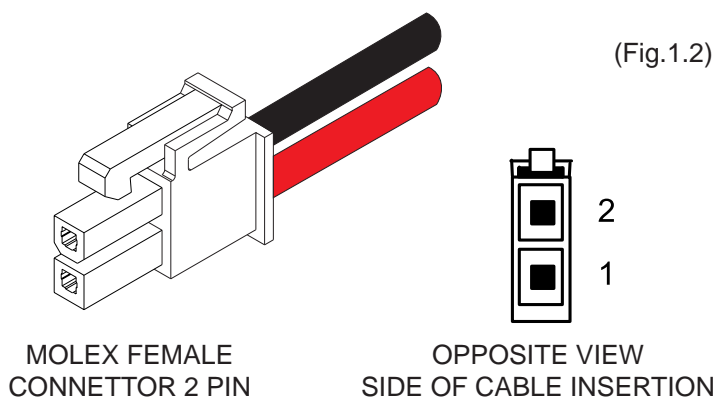
⚠ **WARNING:**
Respect power supply polarity.

1.2 SELF-TEST

Printer operating status is indicated in the configuration print-out in which, next to the name of the components displayed (see figure 1.3), the following information is given:

- Under **PROGRAM MEMORY**, the message OK appears if functioning and NOT OK if faulty.
- Under **PRINTER BUFFER**, the message OK appears if functioning and NOT OK if faulty.
- Under **CUTTER**, the message OK appears if functioning and NOT OK if faulty.
- Under **HEAD VOLTAGE** is given the voltage of the head.
- Under **HEAD TEMPERATURE** is given the temperature of the head.

(Fig.1.3)

PRINTER SETUP

PROGRAM MEMORY....................OK
PRINTER BUFFER ....OK
CUTTER..OK
HEAD VOLTAGE [V]   = 24,29
HEAD TEMPERATURE [°C]   = 32

Printer emul. ....:	**ESC/POS (TM)**
Baud Rate ....:	**9600 bps**
Data Length..............................:	**8 bits/chr**
Parity ....:	**None**
Handshaking ....:	**Xon/Xoff**
Autofeed ....:	**CR Disabled**
USB Address Number [1] ....:	**0**
USB Monitor [1] ....:	**Disabled**
Panel Key.................................:	**Enabled**
Print Mode ....:	**Normal**
Chars / line ....:	**A=32/B=42 col**
Speed / Quality..........................:	**Normal**
Offline [2] ....:	**Disabled**
Print Density..............................:	Normal

[PRINT]   *key to enter setup*
[FEED]   *key to skip setup*

1.3 CONFIGURATION

The printer enables the configuration of the printer default parameters pressing both the PRINT and the FEED keys during the printer power up. The parameters affected during configuration are:

- **Printer emulation:** ESC/POSTM ^{D}, CUSTOM DPT24, CUSTOM DPT42 or CBM iDP560RS.
- **Baud Rate:** 115200, 57600, 38400, 19200 ^{D}, 9600, 4800, 2400, 1200.
- **Data length:** 7, 8 ^{D} bits/car.
- **Parity:** None ^{D}, even or odd.
- **Handshaking:** XON/XOFF ^{D} or Hardware.
- **Autofeed:** CR disabled ^{D} or CR enabled.
- **USB Address** [1]**:** 0 ^{D}, 1, 2, 3, 4, 5, 6, 7, 8, 9.
- **USB Monitor** [1]**:** Disabled ^{D} or enabled.
- **Panel key:** Enable ^{D} or disabled.
- **Print mode:** Normal ^{D} or Reverse.
- **Chars/line:**   With **"ESC/POS"**:   Chars / line: A=32 / B=42 col.D or A=42 / B=56 col.
                        With **"DPT24"**:   Font type: Font A ^{D} or Font B.
                        With **"DPT42"**:   Font type: Font A ^{D} or Font B.
                        With **"CBM iDP560RS"**:Font dimensions: 11x24 ^{D} 40 col. or 18x24 24 col.
- **Speed/Quality:** Normal ^{D}, low.
- **Offline** [2]**:** Disabled ^{D}, Enabled.
- **Print density:** Normal ^{D}, Dark, Very Dark, Light, Very Light.

General note: The parameters marked with the symbol ^{D} represent the default values.
Note [1]**:**   These parameters are shown only for the USB interface models.
Note [2]**:**   Using this parameter, it is possible to select whether the Busy signal is activated when the printer is both in Off Line status and the buffer is full, or only if the reception buffer is full.

The settings made are saved on the EEPROM (non volatile memory).
During the setup routine the printer prints out the setup report and will remain in standby until another key is pressed or characters are received through the printer communication port. After this, each time the PRINT key is pressed, the parameter is modified and its current value is printed. Once the required value has been obtained, press the FEED key to proceed to the next parameter, and so on. Once all the parameters have been run through, the printing of a message signals the end of the setting procedure.

1.4 HEXADECIMAL DUMP

(Fig.1.4)

This function is used to display the characters received from the communications port; the printer prints out both the hexadecimal code received as well as the corresponding ASCII code (see Fig.1.4).
Once the autotest routine has finished, the printer enters Hexadecimal Dump mode. The scanner remains in standby until a key is pressed or characters are received from the communications port; for every 24 characters received it prints hexadecimal values and ASCII codes (if the characters appear underlined, it means the receive buffer is full). Shown below is an example of a Hexadecimal Dump:

```
        HEXADECIMAL DUMP

31 32 33 34 35 36 37 38      12345678
39 30 31 32 33 34 35 36      90123456
37 38 39 75 69 73 64 66      789uisdf
68 6B 6A 73 64 68 66 68      hkjsdhfh
73 64 66 6B 6A 68 73 64      sdfkjhsd
66 73 64 66 6B 68 6A 77      fsdfkhjw
65 69 6F 79 75 77 71 65      eioyuwqe
6F 72 69 75 77 65 72 69      oriuweri
6F 75 77 65 72 69 6F 75      ouweriou
77 65 72 69 6F 75 77 65      weriouwe
72 69 6F 75 77 65 72 68      riouwerh
6B 6C 73 64 66 68 6B 73      klsdfhks
64 66 6B 73 64 66 68 6A      dfksdfhj
73 64 66 6B 6A F2 73 64      sdfkj≥sd
66 6B F2 6A 73 68 64 66      fk≥jshdf
6A 6B 6C 68                  jklh
```

(Fig.1.4)

1.5 MAINTENANCE

⚠️ **WARNING**
Make sure no water or other liquids seep inside the printer.

⚡ **BEWARE**
Before any type of work is done on the machine, disconnect the power supply cord from the mains outlet.

⚡ **ATTENTION**
Do not touch the head heating line with bare hands or metal objects. Do not perform any operation inside the printer immediately after printing because the head and motor tend to become very hot.

1.5.1 Open the printer

To open the printer proceed as follow:

• Rotate the paper mouth unit to the maximum opening position (see Fig.1.5); in this position the paper mouth unit stay opened.
• Widen the hooks that block the cutter unit and rotate the cutter unit up (see Fig.1.6).

✏️ **NOTE**
After each maintenance operation is recommended to check and remove possible scraps of paper.
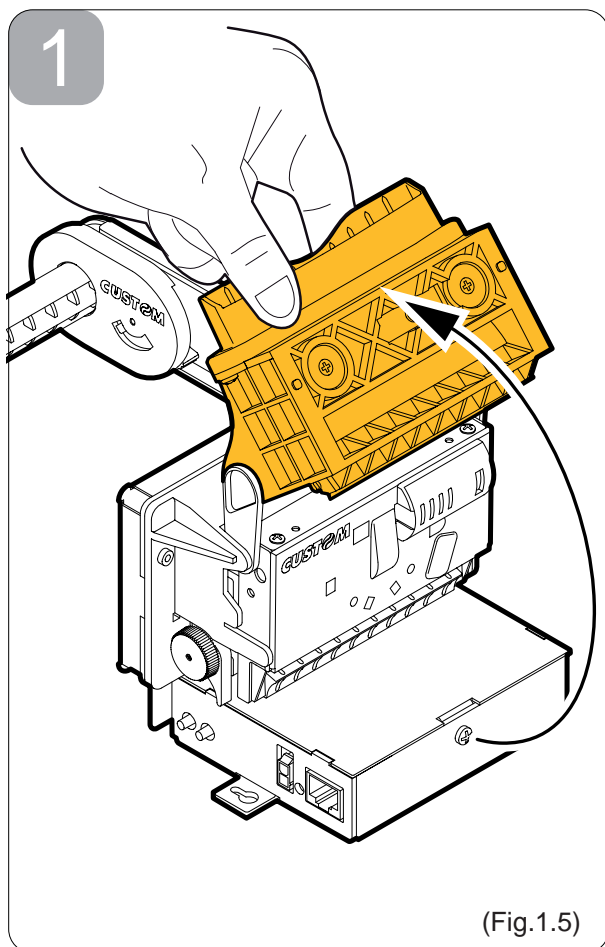
(Fig.1.5)
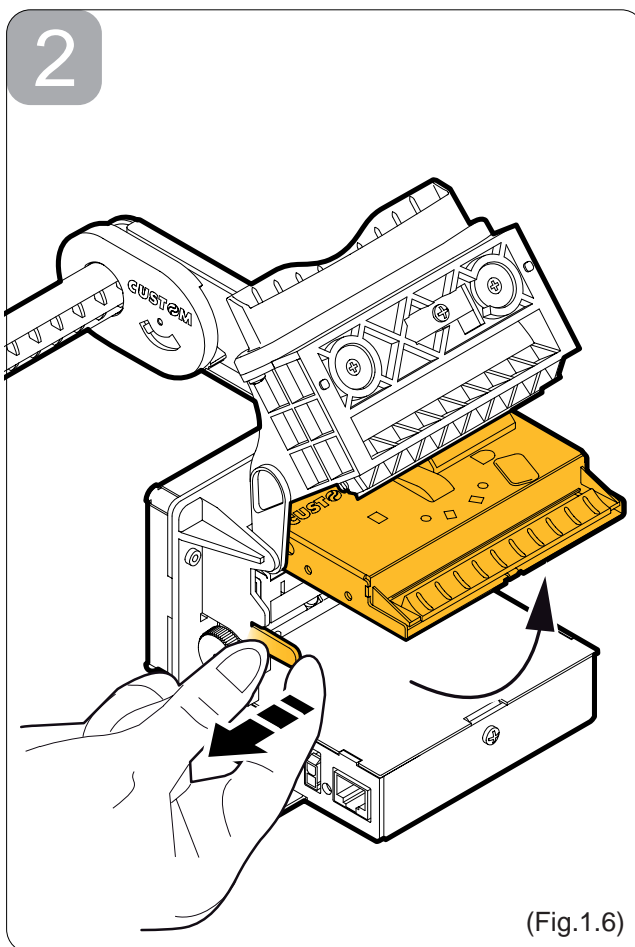
(Fig.1.6)

1.5.2 Paper jam

- Lift the inspection door and remove possible scraps of paper (see Fig.1.7).
- Open the printer (see previous paragraphs).
- Lift the unblocking lever for rubbed roller (see Fig.1.8).
- Rotate the rubbed roller clockwise to eject the paper (see Fig.1.9).

(Fig.1.7)

See previous paragraph

(Fig.1.8)

(Fig.1.9)
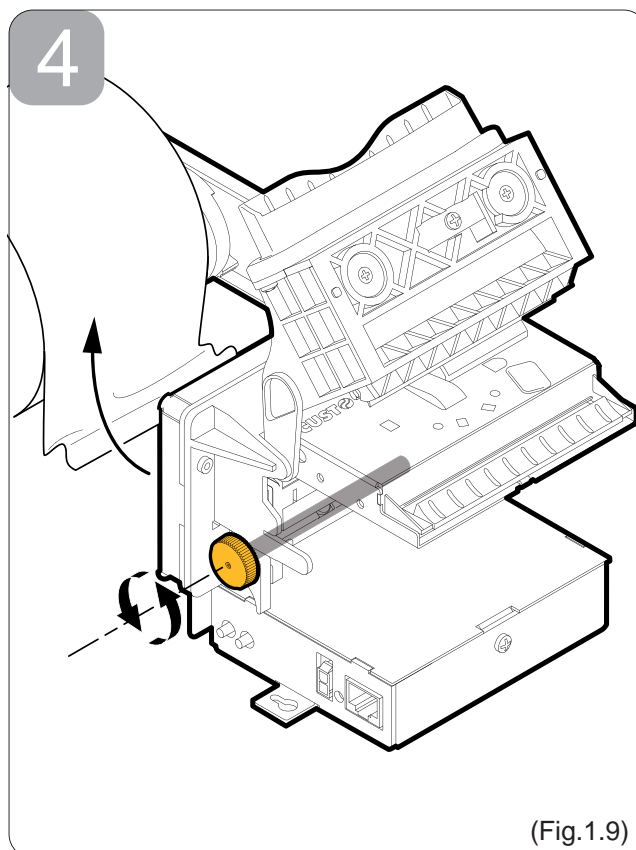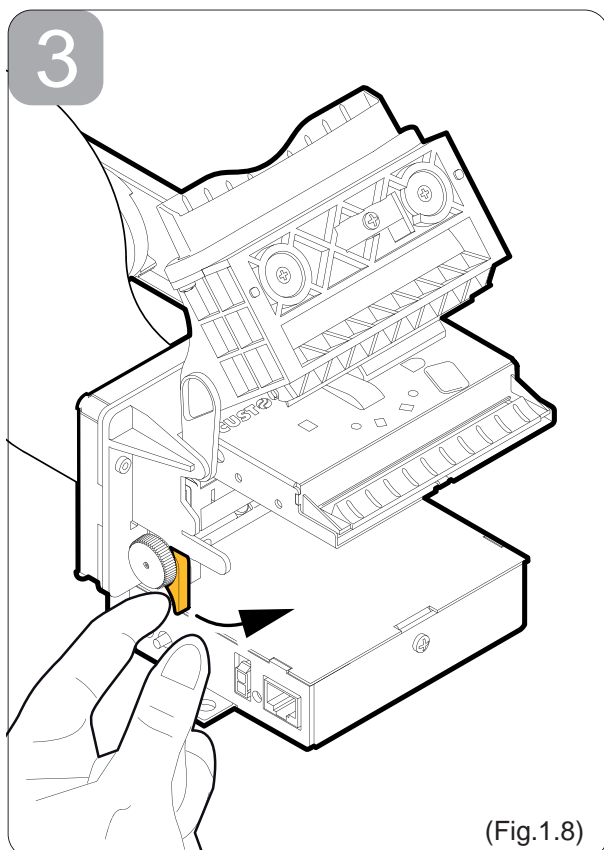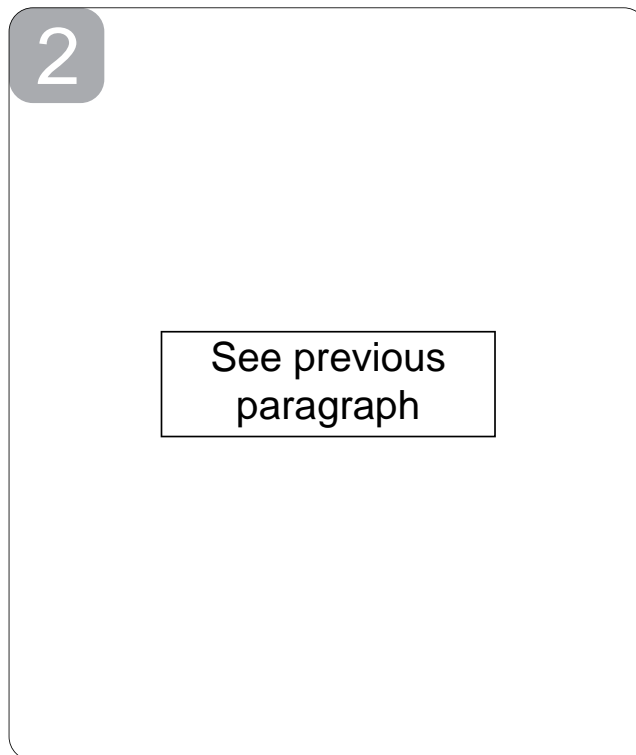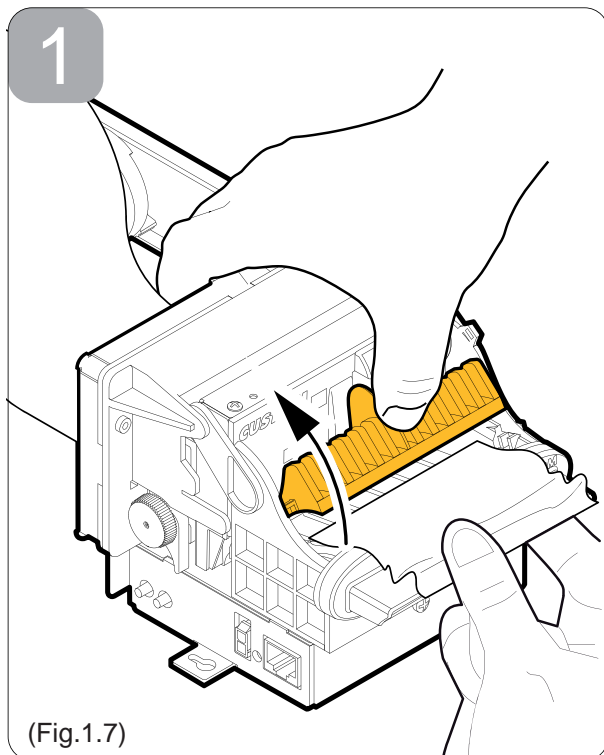
1.5.3 Adjustment for paper roll holder support

• Rotate the knob (A) to adjust the housing width for paper roll (see fig. A.10). So it is possible to use paper width less than 80 mm as needed.
• Rotate the lever (B) to adjust the sensor position for nearly paper end (C). Move the lever up to increase the reserve of paper, move the lever down to decrease the reserve of paper (see Fig. 1.11).

(Fig.1.10)

(Fig.1.11)
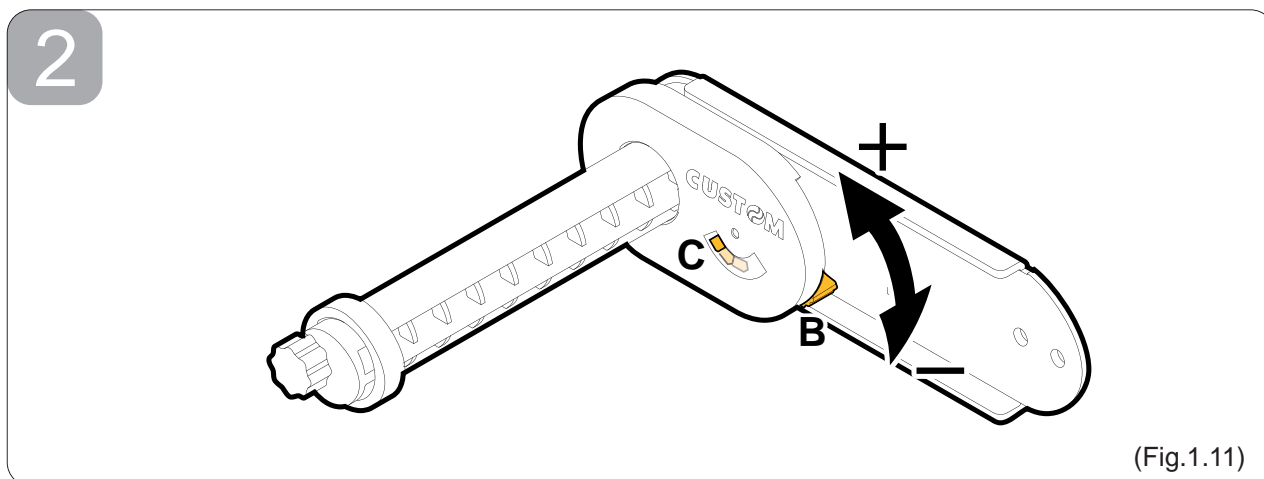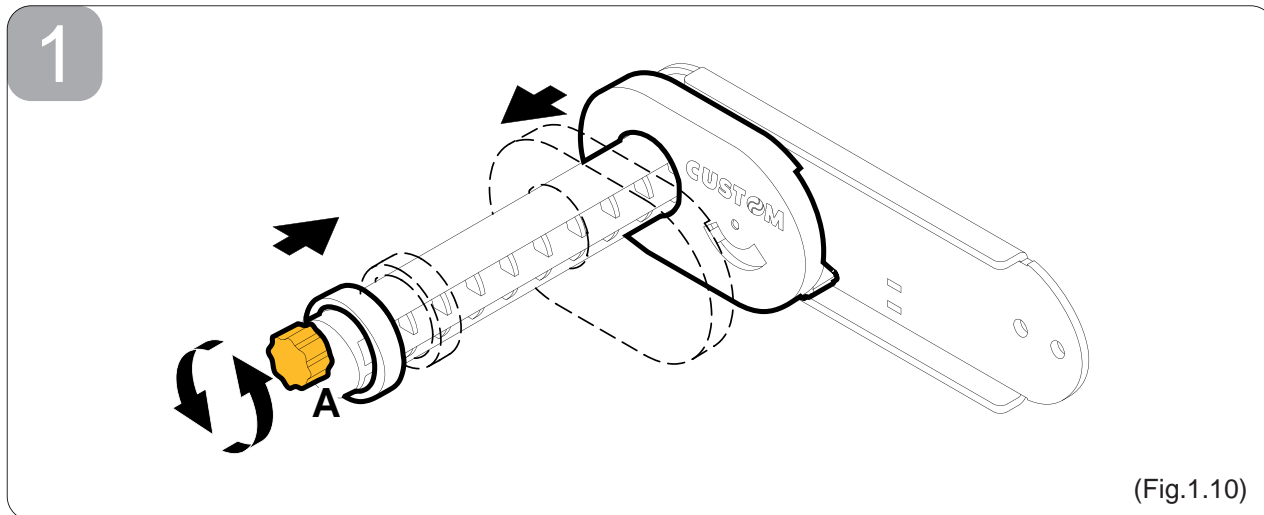
1.5.4 Positioning paper roll holder support

The paper roll holder support positioning isn't fixed but adjustable on 3 different positions (rear **P1**, lower **P2** and upper **P3**). To fastening the paper roll holder support proceed as follow:

1. Bring up the paper roll holder support. Move it until the two holes coincide with the two holes on the printer body.
2. Fasten the paper roll holder support with the printer body by the two M4x6 fastening screws supplied.

⚠ **WARNING**
Before fastening the paper roll holder support check the cable path (near paper end sensor) is correct. Incorrect positions of the cable could cause damage on it.

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P1

(Fig.1.12)

P2

P3
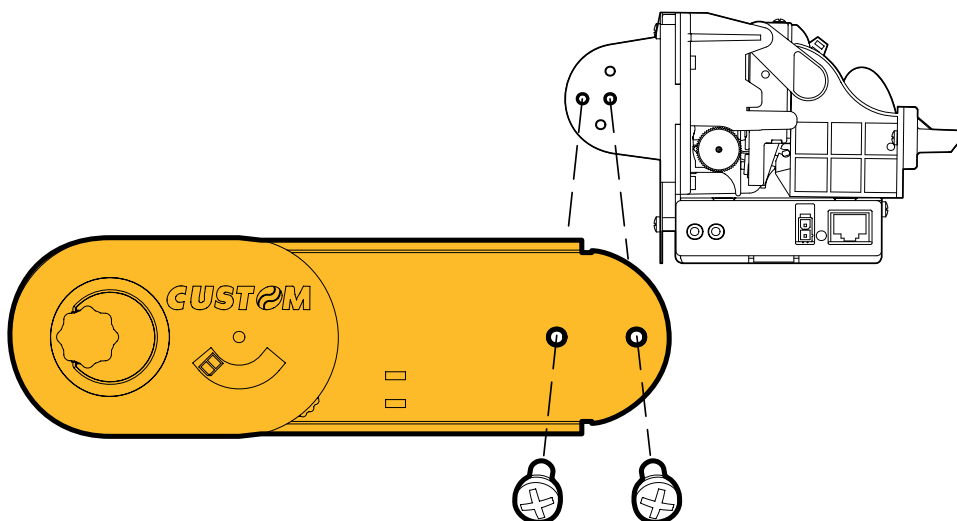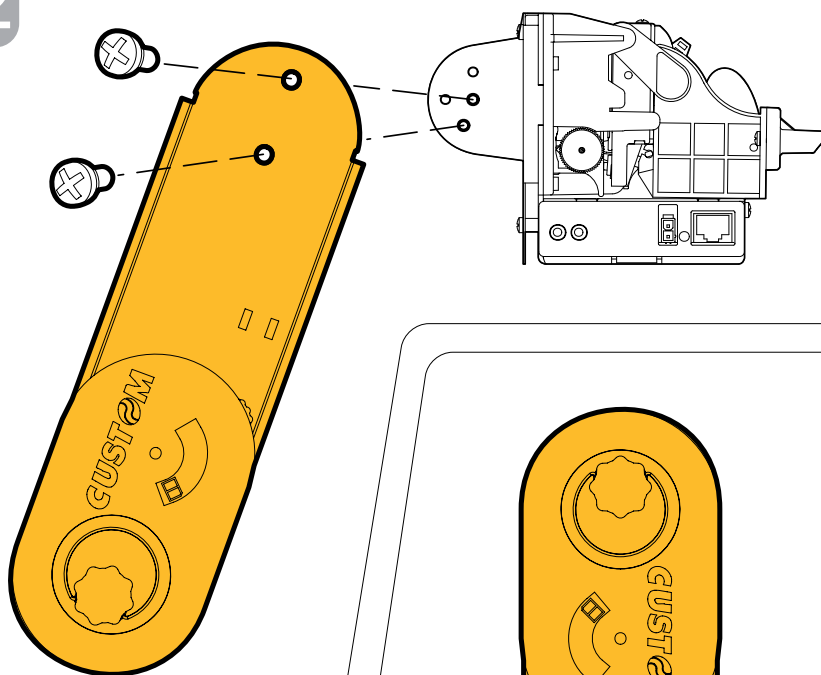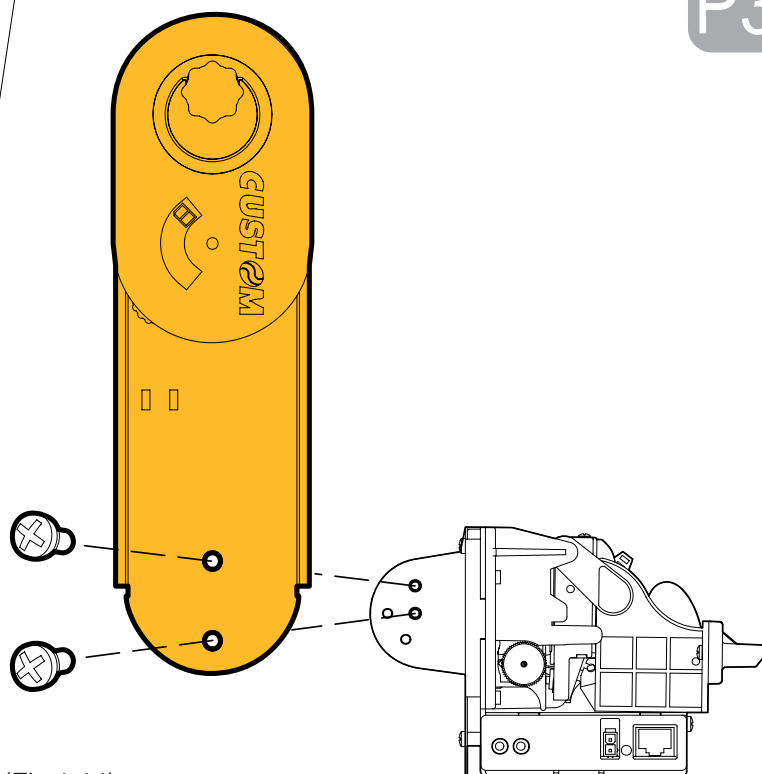
(Fig.1.13)

(Fig.1.14)

1.5.5 Replace paper roll

To replace the paper roll proceed as follow:

- Put the paper roll on the paper roll holder support.
- Insert the paper into the paper infeed opening so that it unrolls in the direction shown and wait for it to load automatically (see Fig.1.15);
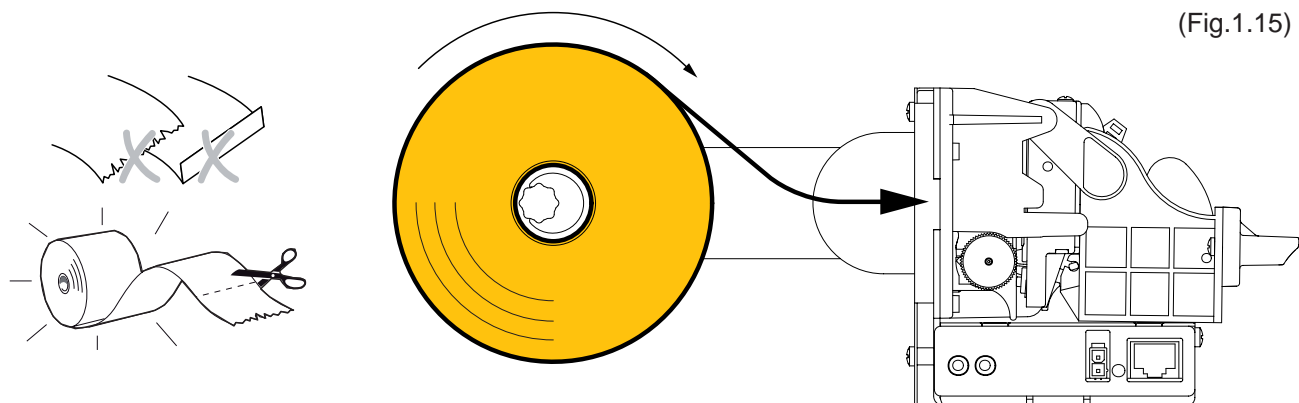
(Fig.1.15)

WARNING
Before inserting the paper, make sure the cut is straight.
Follow loading specifications (Fig.1.15)

1.5.6 Cleaning the printer case

The user is responsible for cleaning the printer case. To clean the unit, use compressed air or a soft cloth. Do not use alcohol, solvents or stiff brushes.

Alcohol, solvent

(Fig.1.16)
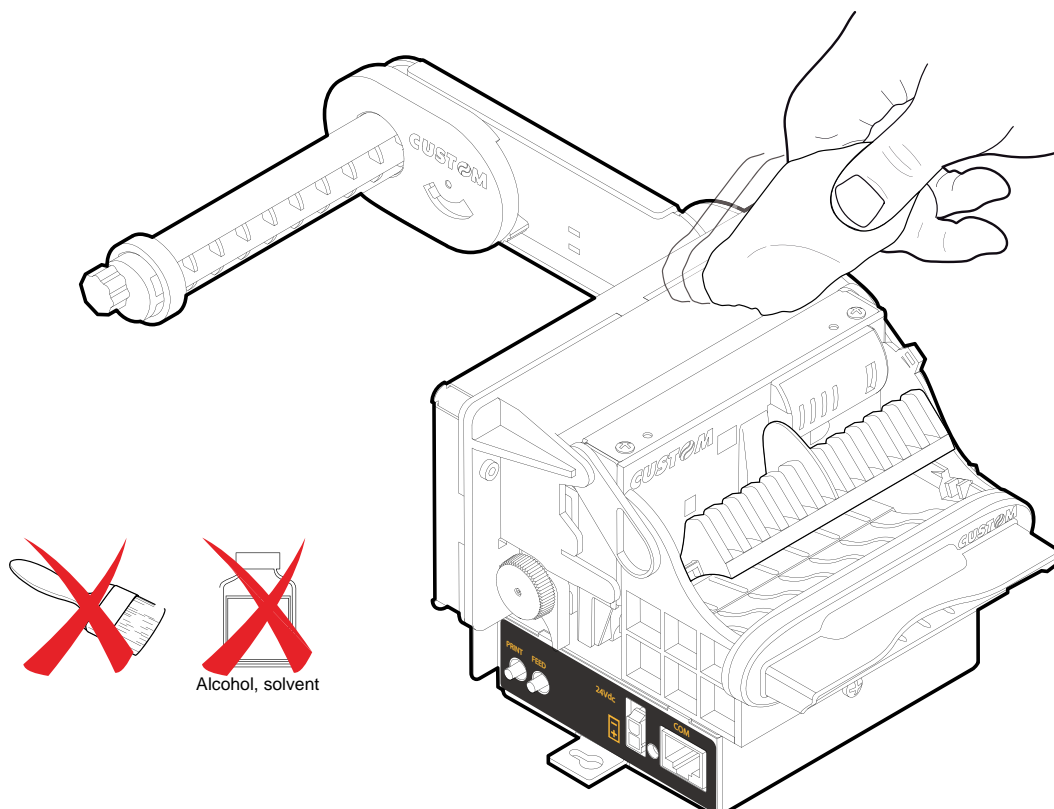
1.6 TICKET WITHDRAWAL SENSOR

The printer is equipped with a paper dispense restriction device to prevent damage on the printing mechanism in case of ticket withdrawal before the printing is end. This device is composed of an oscillating plane under the inspection door, linked with a sensor.
When the user make a ticket withdrawal before the printing is end, the ticket stretch causing the lowering of the oscillating plane. Ticket printing immediately stops, and the printer perform the ticket cut.

(Fig.1.17)

Blank page

CUST*O*M
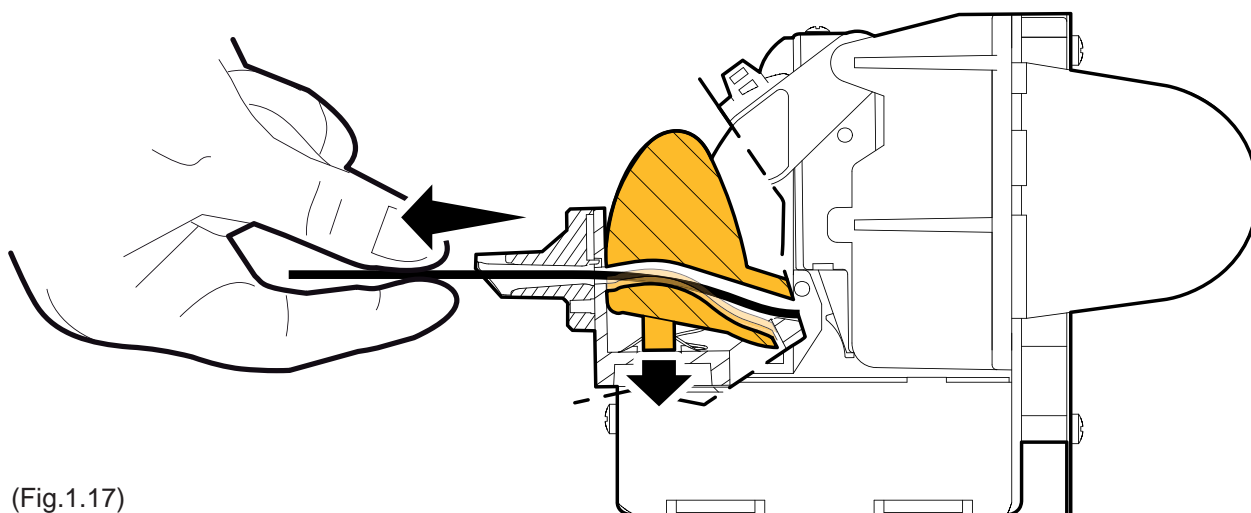
2.1 RS232 SERIAL INTERFACE

(Fig.2.1)
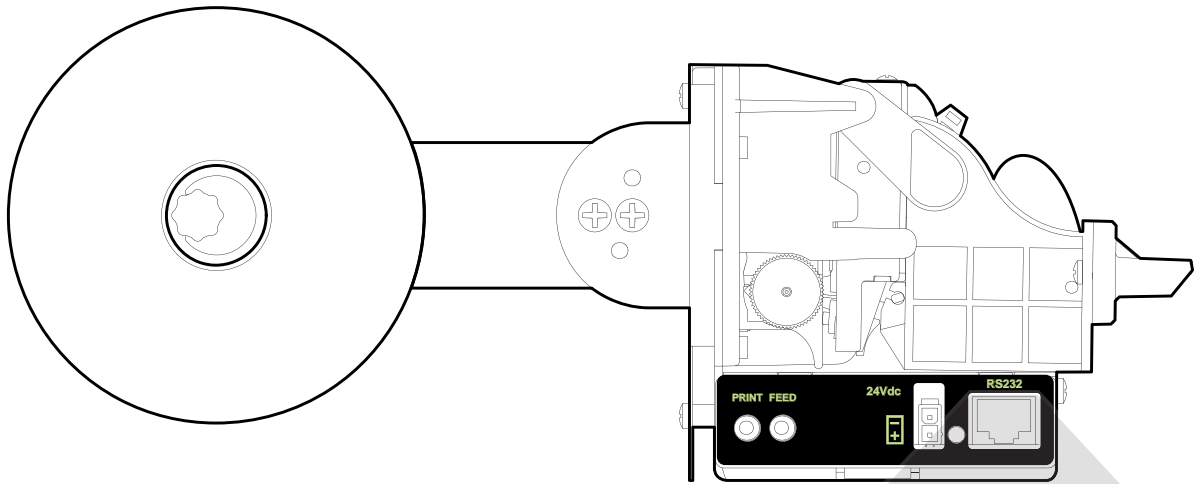
The printer with a serial RS232 interface has a female RJ45 connector. Refer to the table below for the connector pin signals:

PIN	SIGNAL	DESCRIPTION
1	N.C.	Not connected
2	GND	Ground signal
3	TXD	Data transmission
4	RXD	Data reception
5	RTS	Ready to send
6	N.C.	Not connected
7	N.C.	Not connected
8	N.C.	Not connected
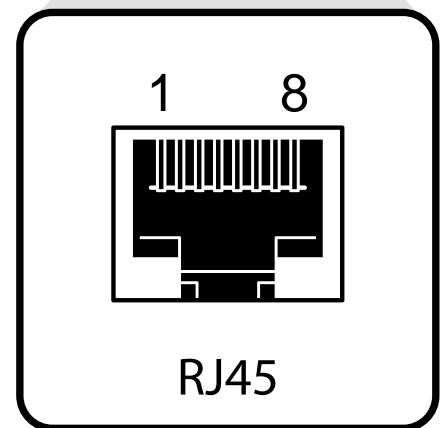
RJ45

The diagrams below show a sample connection between printer and PC using a 8 pin male RJ45 connector and a 9 pin female connector:

(Fig.2.2)
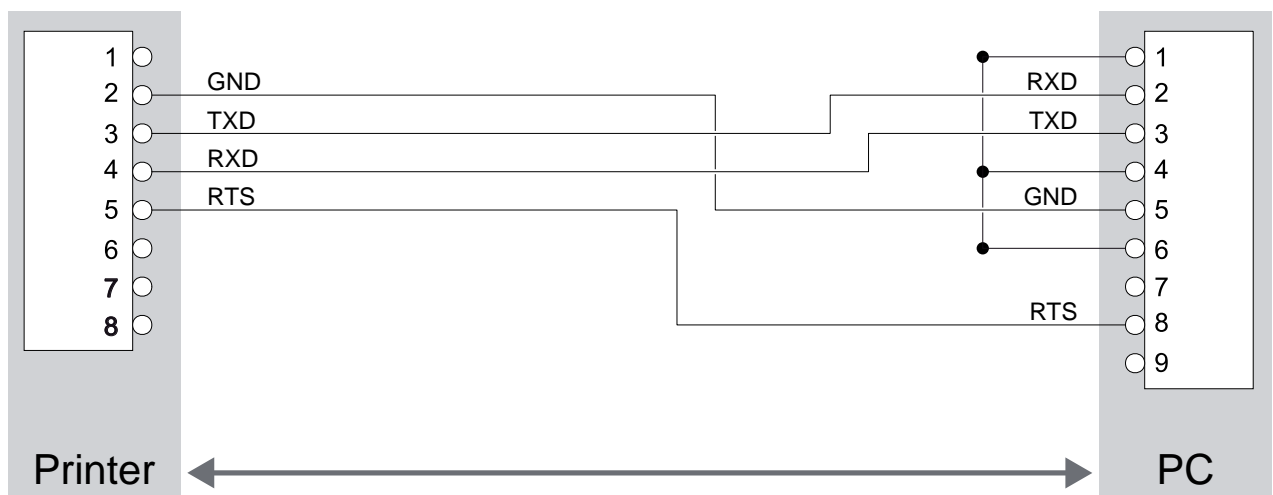
Printer ⟷ PC

2.2 USB INTERFACE

(Fig.2.3)
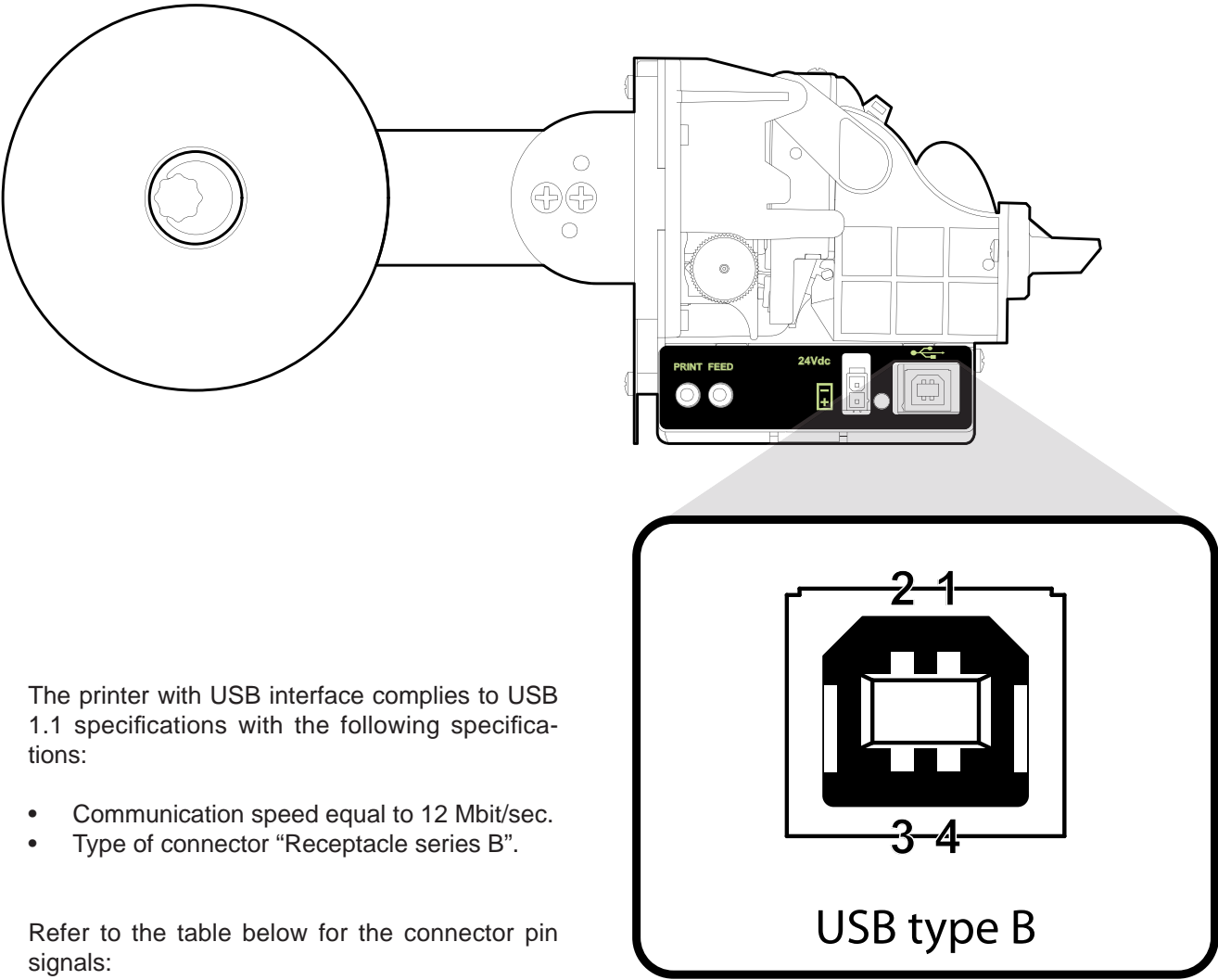
The printer with USB interface complies to USB 1.1 specifications with the following specifications:

- Communication speed equal to 12 Mbit/sec.
- Type of connector "Receptacle series B".

Refer to the table below for the connector pin signals:

USB type B

(Tab.2.1)

PIN	SIGNAL	DESCRIPTION
1	VBUS	N.C.
2	D-	Data -
3	D+	Data +
4	GND	Ground signal
Shell	Shield	Cable shielding

CUST**⌖**M

3.1 PRINT DIRECTION

The printer has two printing directions which can be selected by means of the control characters: normal and reverse.

(Fig.3.1)
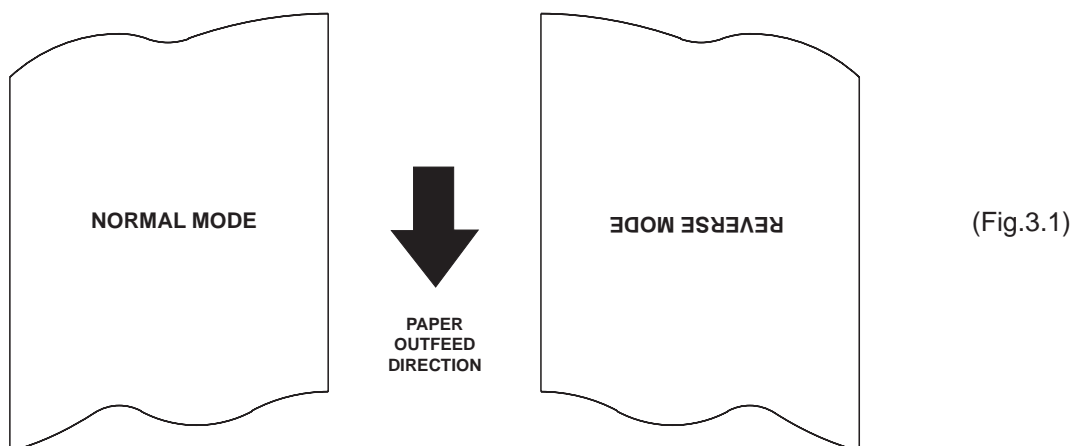
3.2 COMMAND DESCRIPTIONS

The table 3.1 shows the commands list, ordered by their hexadecimal value.

LEGEND :

Symbol	Function
$	indicates the representation of the command hexadecimal value (for example $40 means HEX 40).
{ }	indicates an ASCII character not performable.
n, m, t, x, y	are optional parameters that can have different values.

3.2.1 ESC/POS Emulation

The following table lists all the commands for function management in ESC/POS Emulation of the printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands ahead of them have been executed. The commands are carried out when the circular buffer is free to do so.

COMMAND DESCRIPTION TABLE

(Tab.3.1)

HEX Com.	ASCII Com.	Description
$08	BS	Moving back of one character
$09	HT	Horizontal tabs
$0A	LF	Print and line feed
$0D	CR	Print and line feed
$10 $04 n	DLE EOT n	Transmission of status in real time
$18	CAN	Cancel print data buffer
$1B $20 n	ESC SP n	Set character right-side spacing
$1B $21 n	ESC ! n	Set print mode
$1B $24 nL nH	ESC $ nL nH	Set absolute print position
$1B $2A m nL nH d1...dk	ESC * m nL nH d1...dk	Set bit image mode
$1B $2D n	ESC - n	Turn underline mode on/off
$1B $30	ESC 0	Select 1/8-inch line spacing

$1B $32	ESC 2	Select 1/6-inch line spacing
$1B $33 n	ESC 3 n	Set line spacing using minimum units
$1B $34 n	ESC 4 n	Set / reset script mode
$1B $3D n	ESC = n	Select device
$1B $40	ESC @	Initialize the printer
$1B $44 n1...nk 00	ESC D n1...nk NUL	Set horizontal tab position
$1B $45 n	ESC E n	Select bold mode
$1B $47 n	ESC G n	Select double-strike mode
$1B $4A n	ESC J n	Print and feed paper
$1B $52 n	ESC R n	Select international character set
$1B $56 n	ESC V n	Set print mode rotated by 90°
$1B $5C nL nH	ESC \ nL nH	Set relative print position
$1B $61 n	ESC a n	Select justification
$1B $63 $35 n	ESC c 5 n	Enable / disable panel keys
$1B $64 n	ESC d n	Print and feed paper n lines
$1B $69	ESC i	Total cut
$1B $74 n	ESC t n	Select character code table
$1B $76	ESC v	Transmit printer status
$1B $78 n	ESC x n	Select speed / quality mode
$1B $7B n	ESC { n	Select upside-down printing mode
$1B $FA n xH xL yH yL	ESC · n xH xL yH yL	Print graphic bank
$1B $FF m nL nH d0...dn	ESC { } m nL nH d0...dn	Receive and store logos in flash
$1C $C0 $AA $0F $EE $0B $34	FS { } { } SI { } VT 4	Total cut and automatic paper moving back
$1D $21 n	GS ! n	Select character size
$1D $3A	GS :	Start / end of macro definition
$1D $42 n	GS B n	Turn white/black reverse printing on/off
$1D $43 $30 n m	GS C 0 n m	Select counter print mode
$1D $43 $31 aL aH bL bH n r	GS C 1 aL aH bL bH n r	Select count mode (A)
$1D $43 $32 nL nH	GS C 2 nL nH	Select counter
$1D $43 $3B sa $3B sb $3B sn $3B sr $3B sc $3B	GS C ; sa ; sb ; sn ; sr ; sc ;	Select count mode (B)
$1D $48 n	GS H n	Select printing position of HRI characters
$1D $49 n	GS I n	Transmit printer ID
$1D $4C nL nH	GS L nL nH	Set left margin
$1D $50 x y	GS P x y	Set horizontal and vertical motion units
$1D $57 nL nH	GS W nL nH	Set printing area width
$1D $5E r t m	GS ^ r t m	Execute macro
$1D $63	GS c	Print counter
$1D $66 n	GS f n	Select font for HRI characters
$1D $68 n	GS h n	Set bar code height
$1D $6B m 00	GS k m NUL	Print bar code
$1D $72 n	GS r n	Transmit status
$1D $77 n	GS w n	Set bar code width
$1D $7E n	GS ~ n	Set superscript / subscript
$1D $7C n	GS	n	Set printing density

The following pages provide a more detailed description of each command.

$08

[Name]	**Moving back of one character.**	
[Format]	ASCII	BS
	Hex	08
	Decimal	8
[Description]	Moves print position to previous character.	
[Notes]	This command can put two characters at the same position.	
[Default]		
[Reference]		
[Example]		

$09

[Name]	**Horizontal tabs.**	
[Format]	ASCII	HT
	Hex	09
	Decimal	9
[Description]	Moves the print position to the next horizontal tab position.	

[Notes]
• This command is ignored if the next horizontal tab position has not been set.
• If the next horizontal tab is outside the print area, the printer will print the entire contents of the print buffer, then proceed with the processing of the horizontal tabs from the beginning of the following line.
• The horizontal tabs are set through the command $1B $44.

[Default]	
[Reference]	$1B $44
[Example]	

$0A

[Name]	**Print and line feed.**	
[Format]	ASCII	LF
	Hex	0A
	Decimal	10
[Description]	Prints the data in the buffer and feeds one line, based on the current line spacing.	
[Notes]	• This command sets the print position at the beginning of the line.	
[Default]		
[Reference]	$1B $32, $1B $33	
[Example]		

$0D

[Name]	**Print and line feed.**	
[Format]	ASCII	CR
	Hex	0D
	Decimal	13

[Description] When autofeed is $0D enabled, this command functions in the same way as $0A, otherwise it is ignored.

[Notes]	• This command sets the print position at the beginning of the line.
[Default]	See autofeed parameter on Setup.
[Reference]	$0A
[Example]	

$10 $04 n

[Name]	Transmission of status in real time
[Format]	ASCII DLE EOT n
	Hex 10 04 n
	Decimal 16 4 n
[Range]	1 ≤ n ≤ 4, n =17, 20 ≤ n ≤ 21
[Description]	Transmits in real time the selected status of the printer specified by n according to the following parameters:

n = 1   transmit printer status
n = 2   transmit off-line status
n = 3   transmit error status
n = 4   transmit paper roll sensor status
n = 17   transmit paper status
n = 20   transmit Full Status
n = 21   transmit printer ID ($6D)

[Notes]	• This command is executed even when the reception buffer is full.
	The status is transmitted whenever the data sequence $10 $04 n is received.
[Default]	
[Reference]	
[Example]	

n=1: Printer status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	-	-	-	RESERVED
1	-	-	-	RESERVED
2	-	-	-	RESERVED
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	-	-	-	RESERVED
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	-	-	-	RESERVED

n=2: Off-line status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	-	-	-	RESERVED
1	-	-	-	RESERVED
2	Off	00	0	Print head down (no paper jam).
	On	04	4	Print head up (paper jam).
3	Off	00	0	Paper is not being fed by FEED button.
	On	08	8	Paper is being fed by FEED button.
4	-	-	-	RESERVED
5	Off	00	0	No paper end stop.
	On	20	32	Printing stops due to paper end.
6	Off	00	0	No error
	On	40	64	Error
7	-	-	-	RESERVED

n=3: Error status

Bit	Off/On	Hex	Decimal	FUNCTION
0	-	-	-	RESERVED
1	-	-	-	RESERVED
2	-	-	-	RESERVED
3	Off	00	0	No auto-cutter error.
	On	08	8	Auto-cutter error.
4	-	-	-	RESERVED.
5	Off	00	0	No irreversible error.
	On	20	32	Irreversible error.
6	Off	00	0	No auto-recoverable error.
	On	40	64	Auto-recoverable error.
7	-	-	-	RESERVED.

n=4: Paper roll sensor status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	-	-	-	RESERVED
1	-	-	-	RESERVED
2, 3	Off	00	0	Paper is detected by the near paper end sensor.
	On	0C	12	Paper end sensor not presentor near paper end.
4	-	-	-	RESERVED
5, 6	Off	00	0	Paper is detected by the paper end sensor.
	On	60	96	Paper end is detected by the paper end sensor.
7	-	-	-	RESERVED

n=17: Paper status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	-	-	-	RESERVED
1	-	-	-	RESERVED
2	Off	00	0	Motor not running.
	On	04	8	Motor running.
3	-	-	-	RESERVED
4	-	-	-	RESERVED
5	Off	00	0	Paper in.
	On	20	32	Paper end.
6	-	-	-	RESERVED
7	-	-	-	RESERVED

n=20: Full Status (6 bytes)
1° Byte = $10 (DLE)
2° Byte = $0F
3° Byte = Paper Status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Paper in.
	On	01	1	Paper end.
1	-	-	-	RESERVED
2	Off	00	0	Paper in.
	On	04	4	Near paper end.
3	-	-	-	RESERVED
4	-	-	-	RESERVED
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	-	-	-	RESERVED

4° Byte = User Status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Print head down.
	On	01	1	Print head up.
1	Off	00	0	Cover down.
	On	02	2	Cover up.
2	-	-	-	RESERVED
3	Off	00	0	Motor running (paper run).
	On	08	8	Motor not running (paper stand still).
4	-	-	-	RESERVED
5	Off	00	0	FEED key not pressed.
	On	20	32	FEED key pressed.
6	Off	00	0	PRINT key not pressed.
	On	40	64	PRINT key pressed.
7	-	-	-	RESERVED

5° Byte = Recoverable Error Status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Print head temperature normal.
	On	01	1	Print head overheated.
1	Off	00	0	Normal condition
	On	02	2	Irregular eject
2	-	-	-	RESERVED
3	Off	00	0	Power supply voltage in range.
	On	08	8	Power supply voltage out of range.
4	-	-	-	RESERVED
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	-	-	-	RESERVED

6° Byte = Unrecoverable Error Status

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	No auto-cutter error
	On	01	1	Auto-cutter error
1	-	-	-	RESERVED
2	Off	00	0	No RAM error
	On	04	4	RAM error
3	Off	00	0	No EEPROM error
	On	08	8	EEPROM error
4	-	-	-	RESERVED
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	-	-	-	RESERVED

$18

[Name]	**Cancel print data buffer.**	
[Format]	ASCII	CAN
	Hex	18
	Decimal	24
[Description]	Deletes all the print data in the current print buffer.	
[Notes]	This command sets the print position at the beginning of the line.	
[Default]		
[Reference]		
[Example]		

$1B $20 n

[Name]	**Set character right-side spacing.**			
[Format]	ASCII	ESC	SP	n
	Hex	1B	20	n
	Decimal	27	32	n
[Range]	$0 \leq n \leq 255$			
[Description]	Sets spacing to right of character at [n x horizontal or vertical motion units].			

[Notes]
• The spacing to the right of the character for double width mode is double that used for normal mode. When the characters are enlarged, the spacing to the right of the character is m (2 or 4) times the normal value.
• The horizontal and vertical motion units are specified by the command $1D $50. Changing the horizontal or vertical motion does not affect the current right side spacing.
• The command $1D $50 can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal spacing amount.
• In standard mode, the horizontal motion unit is used.
• The maximum right side spacing is 255/200 inches.

[Default]	n = 0
[Reference]	$1D $50
[Example]	

$1B $21 n

[Name]	**Select print mode.**		
[Format]	ASCII	ESC	!	n
	Hex	1B	21	n
	Decimal	27	33	n

[Range]   0 ≤ n ≤ 255

[Description]   Selects the print mode using n (see following tables):

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Character font A selected.
	On	01	1	Character font B selected.
1	-	-	-	RESERVED
2	-	-	-	RESERVED
3	Off	00	0	Bold mode not selected.
	On	08	8	Bold mode selected.
4	Off	00	0	Double height mode not selected.
	On	10	16	Double height mode selected.
5	Off	00	0	Double width mode not selected.
	On	20	32	Double width mode selected.
6	Off	00	0	Script mode not selected.
	On	40	64	Script mode selected.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected

[Notes]
- The printer can underline all the characters, but it cannot underline the space set by commands $09, $1B $24, $1B $5C and 90° clockwise rotated characters.
- When the characters on the same line are enlarged to different heights, they are either aligned at the baseline or topline (see $1D $7E).
- This command resets the left and right margin at the default value (see $1D $4C, $1D $57).
- The command $1B $45 can also turn on/off bold mode. However, the setting of the last received command is effective.
- The command $1B $2D can also turn on/off underline mode. However, the setting of the last received command is effective
- The command $1B $34 can also turn on/off script mode. However, the setting of the last received command is effective.
- The command $1D $21 can select the character size. However,the setting of the last received command is effective.

[Default]   n = 0

[Reference] $1B $45, $1B $2D, $1B $34, $1D $21

[Example]

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$1B $24 nL nH

[Name]	**Set absolute print position.**					
[Format]	ASCII	ESC	$	nL	nH	
	Hex	1B	24	nL	nH	
	Decimal	27	36	nL	nH	

[Range] $0 \leq nL \leq 255$
            $0 \leq nH \leq 255$

[Description]   Sets the distance from the beginning of the line to the position in which the subsequent characters are to be printed.
The distance from the beginning of the line to the print position is [(nL + nH * 256) * (vertical or horizontal motion unit)] inches.

[Notes]   • Settings outside the specified printable area are ignored.
• The vertical and horizontal motion units are specified by $1D $50.
• The command $1D $50 can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.
• In standard mode the horizontal motion unit (x) is used.
• If the setting is outside the printing area width, set absolute print position, but left or right margin is set at default value.

[Default]
[Reference] $1B $5C, $1D $50
[Example]

$1B $2A m nL nH d1...dk

[Name]	**Set bit image mode.**					
[Format]	ASCII	ESC	*	m	nL	nH	d1...dk
	Hex	1B	2A	m	nL	nH	d1...dk
	Decimal	27	42	m	nL	nH	d1...dk

[Range]   m = 0, 1, 32, 33
          $0 \leq nL \leq 255$, $0 \leq nH \leq 1$
          $0 \leq d \leq 255$

[Description]   Selects a bit image-mode using m for the number of dots specified by nL and nH, as follows:

m	Mode	Vertical direction		Horizontal direction (*1)	
		N° dots	DPI	DPI	N° data (k)
0	8 dots single density	8	67	100	nL + nH x 256
1	8 dots double density	8	67	200	nL + nH x 256
32	24 dots single density	24	200	100	(nL + nH x 256) x 3
33	24 dots double density	24	200	200	(nL + nH x 256) x 3

[Notes]   • The commands nL and nH indicate the number of horizontal dots in the graphic image. The nL and nH indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by nL + nH * 256.
• If the bit image data exceeds the number of dots to be printed on a line, the excess data is ignored.
• d indicates the bit image data. Set a corresponding bit to 1 to print dot or to 0 not to print dot.
• If the value of m is out of the specified range, nL and the data following are processed as normal data.
• If the width of the printing area set by the commands $1D $4C and $1D $57 is less than the width required by the data sent with the command $1B $2A , the excess data is ignored.
• To print the bit image use commands $0A, $0D, $1B $4A or $1B $64.
• After printing a bit image, the printer returns to normal data processing mode.
• This command is not affected by bold, double-strike and underline (etc.) print modes, only by upside-down mode.

The relationship between the bit image and the dots to be printed is as follows:

8 dot image   24 dot image

Print data   **Print data**
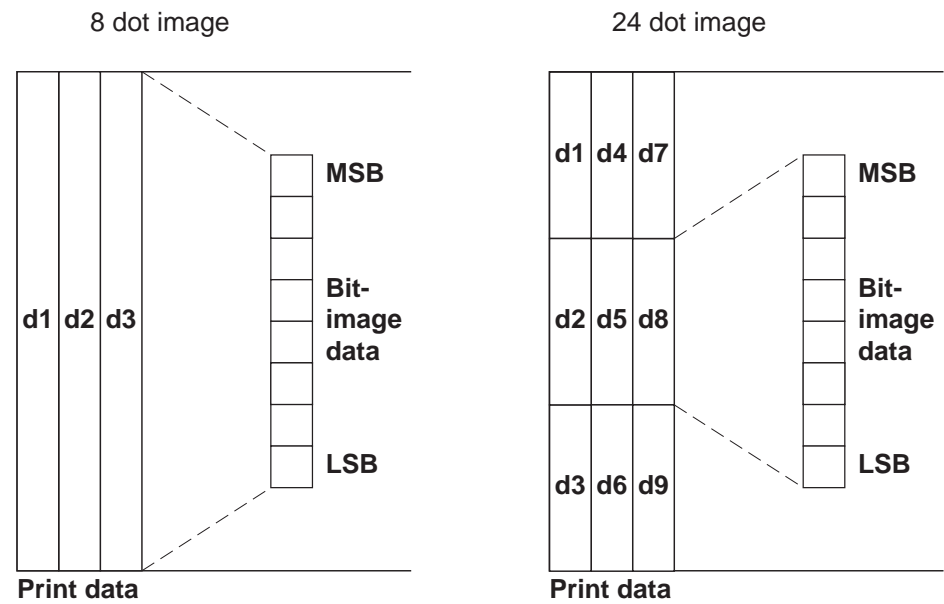
[Default]
[Reference]
[Example]

$1B $2D n

[Name]	**Turn underline mode on/off.**
[Format]	ASCII ESC - n
	Hex 1B 2D n
	Decimal 27 45 n
[Range]	0 ≤ n ≤ 2, 48 ≤ n ≤ 50

[Description]   Turns underline mode on or off, based on the following values of n:
n = 0, 48   Turns off underline mode
n = 1. 49   Turns on underline mode (1-dot thick)
n = 2. 50   Turns on underline mode (2-dot thick)

[Notes]   • The printer can underline all characters but cannot underline the space set by $09 and right-side character spacing.
• The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.
• When underline mode is turned off by setting the value of n at 0 or 48, the following data is not underlined.
• Underline mode can also be turned on or off by using $1B $21. Note, however, that the last command received is effective.

[Default]   n=0
[Reference] $1B $21
[Example]

$1B $30

[Name]	**Select 1/8-inch line spacing.**		
[Format]	ASCII	ESC	0
	Hex	1B	30
	Decimal	27	48
[Description]	Selects 1/8-inch line spacing.		
[Notes]			
[Default]			
[Reference]	$1B $32, $1B $33		
[Example]			

$1B $32

[Name]	**Select 1/6-inch line spacing.**		
[Format]	ASCII	ESC	2
	Hex	1B	32
	Decimal	27	50
[Description]	Selects 1/6 inch line spacing.		
[Notes]			
[Default]			
[Reference]	$1B $30, $1B $33		
[Example]			

$1B $33 n

[Name]	**Set line spacing using minimum units.**			
[Format]	ASCII	ESC	3	n
	Hex	1B	33	n
	Decimal	27	51	n
[Range]	$0 \le n \le 255$			
[Description]	Sets the line spacing at [n * (vertical or horizontal motion unit)] inches.			
[Notes]	• Horizontal and vertical motion units are specified by the command $1D $50. Changing the horizontal or vertical motion unit does not affect the current line spacing.			
	• The command $1D $50 can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum vertical movement amount.			
	• In standard mode, the vertical motion unit is used.			
	• The maximum line spacing is n = 255 (@ 32mm).			
[Default]	n = 32 (1/6 inch)			
[Reference]	$1B $30, $1B $32, $1D $50			
[Example]				

$1B $34 n

[Name]	**Set / reset script mode.**			
[Format]	ASCII	ESC	4	n
	Hex	1B	34	n
	Decimal	27	52	n
[Range]	$0 \le n \le 1$, $48 \le n \le 49$			
[Description]	Turns script mode on or off, based on the following values of n:			

n	FUNCTION
0, 48	Turns script mode off
1, 49	Turns script mode o

[Notes]	• The printer can print all characters in script mode.
	• When script mode is turned off by setting the value n at 0 or 48, the data that follows is printed in normal mode.

• Script mode can also be turned on or off by using $1B $21. Note, however, that the last command received is effective

[Default]   n = 0
[Reference] $1B $21
[Example]

$1B $3D n

[Name]   **Select device.**
[Format]   ASCII   ESC   =   n
               Hex   1B   3D   n
               Decimal   27   61   n
[Range]   0 ≤ n ≤ 255
[Description] Selects the device to which the host computer sends data, using n as follows:

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Printer disabled.
	On	01	1	Printer enabled.
1	-	-	-	RESERVED
2	-	-	-	RESERVED
3	-	-	-	RESERVED
4	-	-	-	RESERVED
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	-	-	-	RESERVED

[Notes]   • When the printer is disabled, it ignores all transmitted data until the printer is enabled by this command.
[Default]   n = 1
[Reference]
[Example]

$1B $40

[Name]   **Inizialize the printer.**
[Format]   ASCII   ESC   @
               Hex   1B   40
               Decimal   27   64
[Description] Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.
[Notes]   • The data in the reception buffer is not cleared.
               • The macro definitions are not cleared.
[Default]
[Reference]
[Example]

$1B $44 n1...nk 00

[Name]   **Set horizontal tabs position.**
[Format]   ASCII   ESC   D   n1...nk   NUL
               Hex   1B   44   n1...nk   00
               Decimal   27   68   n1...nk   0
[Range]   1 ≤ n ≤ 255
               0 ≤ k ≤ 32
[Description] Sets the horizontal tabs.
               • nspecifies the number of columns for setting a horizontal tab from the beginning of the line.
               • k indicates the total number of horizontal tabs to be set.

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[Notes]	• The horizontal tab position is stored as a value of [character width x n] measured from the beginning of the line. The width of the character includes the space to the right of the character and double width characters are set with a width which is double that of normal characters.
	• This command cancels the previous horizontal tab setting.
	• When setting n = 8, the print position is moved to column 9 by sending HT.
	• Up to 32 tab positions can be set (k = 32). Any data exceeding the 32 tabs is processed as normal data.
	• Transmit [n] k in ascending order and put a code 0 NUL at the end. When [n] k is less than or equal to the preceding value [n] k-1, tab setting is finished and the following data is processed as normal data.
	• This command cancels all horizontal tab positions.
	• The previously specified horizontal tab positions do not change, even if the character width changes.
[Default]	The default tabs are at intervals of 8 characters (columns 9, 17, 25, …) for the A Font when the space to the right of the character is 0.
[Reference]	$09
[Example]	

$1B $45 n

[Name]	**Select bold mode.**		
[Format]	ASCII	ESC E	n
	Hex	1B 45	n
	Decimal	27 69	n
[Range]	0 ≤ n ≤ 255		
[Description]	Turns bold mode On or Off.		
	• When the LSB of n is 0, bold mode is turned off.		
	• When the LSB of n is 1, bold mode is turned on.		
[Notes]	• Only the LSB of n is effective.		
	• The command $1B $21 also turns bold mode on and off. In any case, the last command received is enabled.		
[Default]	n = 0		
[Reference]	$1B $21		
[Example]			

$1B $47 n

[Name]	**Select double-strike mode.**		
[Format]	ASCII	ESC G	n
	Hex	1B 47	n
Decimal	Decimal	27 71	n
[Range]	0 ≤ n ≤ 255		
[Description]	Turns double-strike mode On or Off.		
	• When the LSB of n is 0, double-strike mode is turned off.		
	• When the LSB of n is 1, double-strike mode is turned on.		
[Notes]	• Only the LSB of n is effective.		
	• The printer output is the same in double-strike mode and bold mode.		
[Default]	n = 0		
[Reference]	$1B $45		
[Example]			

$1B $4A n

[Name]	**Print and feed paper.**		
[Format]	ASCII	ESC J	n
	Hex	1B 4A	n
	Decimal	27 74	n

[Range]	0 ≤ n ≤ 255
[Description]	Prints the data in the print buffer and feeds the paper [n * (vertical or horizontal motion unit) inches.
[Notes]	• After printing is over, this command sets the print starting position at the beginning of the line.
	• The paper feed amount set by this command does not affect the values set by $1B $32 or $1B $33.
	• The horizontal and vertical motion unit are specified by $1D $50.
	• The command GS P can change the vertical (and horizontal) motion unit. However, the value cannot be less than the minimum vertical movement amount.
	• In standard mode, the vertical motion unit is used.
	• The maximum paper feed amount is 31.8 mm.
[Default]	
[Reference]	$1D $50
[Example]	

$1B $52 n

[Name]	**Select international character set.**			
[Format]	ASCII	ESC	R	n
	Hex	1B	52	n
	Decimal	27	82	n
[Range]	0 ≤ n ≤ 12			
[Description]	Selects the international character set by setting n as in the following table:			

	HEX	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
n	CHARACTERS SET												
0	U.S.A.	#	$	@	[	\	]	^	`	{	|	}	~
1	France	#	$	à	°	ç	§	^	`	é	ù	è	"
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	b
3	United Kingdom	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark I	#	$	@	Æ	Æ	Å	^	`	æ	f	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain I	Pt	$	@	i	Ñ	¿	^	`	"	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#	¤	É	Æ	Æ	Å	Ü	é	æ	f	å	ü
10	Denmark II	#	$	É	Æ	Æ	Å	Ü	é	æ	f	å	ü

[Notes]	
[Default]	n = 0
[Reference]	
[Example]	

$1B $56 n

[Name]	**Set print mode rotated by 90°.**
[Format]	ASCII ESC V n
	Hex 1B 56 n
	Decimal 27 86 n
[Range]	$0 \leq n \leq 1$
	$48 \leq n \leq 49$
[Description]	Enable / disable print mode rotated by 90°.
	n is used as follows:

n	FUNCTION
0, 48	Turns off 90° rotation mode
0,49	Turns on 90° rotation mode

[Notes]	• When underlined mode is turned on, the printer does not underline 90° rotated characters. All the same it's possible select the underline mode.
	• Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double-height and double-width commands in normal mode.
	• This command is not available in Page mode.
	• If this command is entered in Page mode, the printer all the same save the setting.
Default]	n = 0
[Reference]	$1B $21, $1B $2D
[Example]	

$1B $5C nL nH

[Name]	**Set relative print position.**
[Format]	ASCII ESC \ nL nH
	Hex 1B 5C nL nH
	Decimal 27 92 nL nH
[Range]	$0 \leq nL \leq 255$
	$0 \leq nH \leq 255$
[Description]	Sets the print starting position based on the current position by using the horizontal or vertical motion unit.
	This command sets the distance from the current position to [(nL+ nH * 256) * (horizontal or vertical motion unit)].
[Notes]	• Any setting that exceeds the printable area is ignored.
	• When the starting position is specified by n motion units to the right:
	nL + nH * 256 = n
	When the starting position is specified by n motion units to the left (negative direction) use the complement of 65536:
	nL + nH * 256 = 65536 – n
	• If setting exceeds printing area width, left or right margin is set to default value.
	• The horizontal and vertical motion units are specified by $1D $50.
	• The command $1D $50 can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.
	• In standard mode, the horizontal motion unit is used.
[Default]	
[Reference]	$1D $24, $1D $50
[Example]	

$1B $61 n

[Name]	**Select justification.**			
[Format]	ASCII	ESC	a	n
	Hex	1B	61	n
	Decimal	27	97	n
[Range]	0 ≤ n ≤ 2, 48 ≤ n ≤ 50			
[Description]	Aligns all the data in one line in the position specified.			

n selects the type of justification as follows:

n	JUSTIFICATION
0, 48	Left justification
1, 49	Centring
2, 50	Right justification

[Notes] • This command is only enabled if input at the beginning of the line.
• The lines are justified within the specified printing area.
• The spaces set by the commands $09, $1B $24 and $1B $ 5C remain justified as per the previously set mode.

[Default] n = 0
[Reference]
[Example]

Left justification	Left justification	Right justification
ABC ABCD ABCDE	ABC ABCD ABCDE	ABC ABCD ABCDE

$1B $63 $35 n

[Name]	**Enable / disable panel keys.**				
[Format]	ASCII	ESC	c	5	n
	Hex	1B	63	35	n
	Decimal	27	99	53	n
[Range]	0 ≤ n ≤ 255				
[Description]	Enables or disables the front panel keys.				

• When the LSB of n is 0, the panel keys are enabled.
• When the LSB of n is 1, the panel keys are disabled.

[Notes] • Only the LSB of n is effective.
• In the printer, the panel buttons are the FEED and PRINT keys.
• When the panel keys are disabled, the keys can only operate when reset.

[Default] n = 0
[Reference] See the "Panel key" parameter from Setup.
[Example]

$1B $64 n

[Name]	**Print and feed paper n lines.**		
[Format]	ASCII	ESC	d	n
	Hex	1B	64	n
	Decimal	27	100	n
[Range]	0 ≤ n ≤ 255
[Description]	Prints the data in the print buffer and feeds the paper n lines.
[Notes]	• This command sets the print starting position at the beginning of the line.
	• This command does not affect the line spacing set by $1B $32 or $1B $33.
	• The maximum paper feed amount is 200 lines. Even if a paper feed exceeding 200 lines is set, the printer only feeds the paper by 200 lines.
[Default]	
[Reference]	$1B $32, $1B $33
[Example]	

$1B $69

[Name]	**Total cut.**		
[Format]	ASCII	ESC	i
	Hex	1B	69
	Decimal	27	105
[Description]	This command enables cutter operation; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.
[Notes]	• The printer waits until all the paper movement commands have been completed before executing total cut.
[Default]	
[Reference]	
[Example]	

$1B $74 n

[Name]	**Select character code table.**		
[Format]	ASCII	ESC	t	n
	Hex	1B	74	n
	Decimal	27	116	n
[Range]	n = 0, 19, 255
[Description]	Selects a page n from the character code table, as follows:

n	PAGE
0	0 (PC437 [U.S.A., Standard Europe])
19	19 (PC858 for Euro symbol at position 213)
255	Page space

[Note]	
[Default]	n = 0
[Reference]	See character code table
[Example]	For printing Euro symbol (€), the command sequence is: $1B, $74, $13, $D5

$1B $76

[Name]	**Transmit paper status.**
[Format]	ASCII ESC v
	Hex 1B 76
	Decimal 27 118
[Description]	Transmits the current paper sensor status upon receiving this command.
[Notes]	• This command is executed immediately, even when the reception buffer is full (Busy).The status to be transmitted is shown in the table below:

BIT	OFF/ON	HEX	Decimal	FUNCTION
0,1	Off	00	0	Near paper end sensor: Paper present
	On	03	3	Near paper end sensor: Near paper end
2,3	Off	00	0	Paper end sensor: Paper present
	On	(0C)	(12)	Paper end sensor: Paper end
4	Off	00	0	Fixed to Off
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	Off	00	0	Fixed to Off

[Default]	
[Reference]	$10 $04
[Example]	

$1B $78 n

[Name]	**Select speed / quality mode.**
[Format]	ASCII ESC x n
	Hex 1B 78 n
	Decimal 27 120 n
[Range]	$0 \leq n \leq 2$
[Description]	Selects speed / quality mode.

n	FUNCTION
0	Draft mode (high speed)
1	Normal mode
2	High quality (low speed)

[Notes]	• In high quality mode (n= 2), the printer may be noisy.
[Default]	n = 1
[Reference]	
[Example]	

$1B $7B n

[Name]	**Select upside-down printing mode.**
[Format]	ASCII ESC { n
	Hex 1B 7B n
	Decimal 27 123 n
[Range]	$0 \leq n \leq 255$
[Description]	Turns upside-down printing mode on/off.
	• When the LSB of n is 0, upside-down printing mode is turned off.
	• When the LSB of n is 1, upside-down printing mode is turned on.
[Notes]	• Only the LSB of n is effective.
	• This command is only enabled when input at the beginning of a line.
	• In upside-down printing mode, the printer rotates the line to be printed by 180° and then prints it.

[Default]   n = 0
[Reference]
[Example]

Upside-down printing Off   Upside-down printing On

ABCDEFG	123456
123456	ABCDEFG

Paper outfeed direction

$1B $FA n xH xL yH yL

[Name]	**Print graphic bank (608 * 862 dots).**						
[Format]	ASCII	ESC	{ }	n	xH	xL	yH yL
	Hex	1B	FA	n	xH	xL	yH yL
	Decimal	27	250	n	xH	xL	yH yL

[Range] $1 \le n \le 2$
                $0 \le xH, xL, yH, yL \le 255$

[Description]   Prints the graphics bank from flash or ram.
                n selects the bank as follows:

n	FUNCTION
1	Print flash bank logo 1
2	Print flash bank logo

$xL + xH * 256$ specifies the starting dot line ($1 \div 862$).
$yL + yH * 256$ specifies the number of lines to print.

[Notes]   • If $(xL + (xH * 256)) > 862$ the printer does not execute the command.
                • If $(xL + (xH * 256) + yL +(yH * 256)) > 862$ the printer only prints $862 - xL + (xH * 256) + 1$ dotlines.

[Default]
[Reference]
[Example]   To print logo 1 from flash bank dotline 100 to dotline 299, send:
                $1B $FA $01 $00 $64 $00 $C7

$1B $FF m nL nH d0...dn

[Name]	**Receive and store logos in flash.**						
[Format]	ASCII	ESC	{ }	m	nL	nH	d0 dn
	Hex	1B	FF	m	nL	nH	d0 dn
	Decimal	27	255	m	nL	nH	d0 dn

[Range] $0 \le nL, nH \le 255$
                $1 \le m \le 2$
                $0 \le d0, dn \le 255$

[Description]   • Received $[nL + (nH * 256)] * 2$ bytes and store in the flash.
                • If $[nL + (nH * 256)]$ exceeds 32756, the data following will be processed as normal data.
                • Saved the graphics bank from flash. m selects the bank as follows:

m	FUNCTION
1	Save logotype into flash bank 1
2	Save logotype into flash bank 2

                • d0, dn = value of bit stream image

[Default]
[Reference]

[Example]   To store the logotype indicated below ,into flash bank 2, necessity execute the follows operation
1)Define the image dimensions.
The width of image is 608 horizontal pixel; the height maximun of image is 862 vertical pixel.
2) Calculate the number of bytes to send as (height pix * width pix)/16. Bytes number in example is 608 x 862/16=32756 in exadecimal resulting = 7FF4.
3) Bit stream image conversion.
In the following figure is reproduced the logotype enlargement in the zone indicated by the arrow to define d0...dn

In this example; d0=FF; d1=03; d2=FC; d3=0F; ...

Then send this command to the printer:

0x1B	0xFF	0x02	0xF8	0x7F	0xFF	0 x 03	0xFC	0x0F...
		No. logo	Dimension					

$1C $C0 $AA $0F $EE $0B $34

[Name]	**Total cut and automatic paper moving back.**						
[Format]	ASCII	FS	{ }	{ }	SI	{ }	VT	4
	Hex	1C	C0	AA	0F	EE	0B	34
	Decimal	28	192	170	15	254	11	52

[Description]   This command enables cutter operation and executes a total cut and automatic paper moving back; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.

[Notes]   • The printer waits until all the paper movement commands have been completed before executing total cut

[Default]
[Reference]
[Example]

CUSTOM

$1D $21 n

[Name]   **Select character size.**
[Format]   ASCII   GS   !   n
                    Hex   1D   21   n
                    Decimal   29   33   n
[Range]   0 ≤ n ≤ 255
[Description]   Selects character height and width, as follows:
                    • Bits 0 to 3 : character height selection (see table 2).
                    • Bits 4 to 7 : character width selection (see table 1).

Table1: Character width selection

HEX	Decimal	WIDTH
00	0	1 (normal)
10	16	2 (double width)
20	32	3 (quadruple width)
30	48	
40	64	
50	80	
60	96	
70	112	

Table2: Character height selection

HEX	Decimal	HEIGHT
00	0	1 (normal)
01	1	2 (double height)
02	2	3 (quadruple height)
03	3	
04	4	
05	5	
06	6	
07	7	

[Notes]   • This command is effective for all characters (except HRI characters).
                    • If n is outside the defined range, this command is ignored.
                    • When characters are enlarged with different heights on one line, the are aligned at the baseline or topline (see $1D $7E).
                    • The character size can also be selected by the command $1B $21. However,the setting of the last received command is effective.
[Default]   n = 0
[Reference] $1B $21
[Example]

$1D $3A

[Name]   **Start / end macro definition.**
[Format]   ASCII   GS   :
                    Hex   1D   3A
                    Decimal   29   58
[Description]   Starts or ends macro definition.
[Notes]   • Macro definition starts when this command is received during normal operation.
                    • When the command $1D $5E is received during macro definition, the printer ends the macro definitions and clears all definitions.
                    • Macro not defined when the power is turned on.
                    • The defined contents of the macro are not cleared by the command $1B $40. Therefore, $1B $40 can be included in the contents of the macro definitions.
                    • If the printer receives the command $1D $3A again immediately after previously receiving $1D $3A, the printer remains in the macro undefined state.
                    • The contents of the macro can be defined up to 1024 bytes. If the macro definition exceeds 1024 bytes, the excess data is not not stored.
[Default]
[Reference] $1D $5E
[Example]

$1D $42 n

[Name]	**Turn white / black reverse printing on/off.**			
[Format]	ASCII	GS	B	n
	Hex	1D	42	n
	Decimal	29	66	n
[Range]	0 ≤ n ≤ 255			
[Description]	Turns white/black reverse printing mode on or off.			

• When the LSB of n is 0, white/black reverse printing is turned off.

• When the LSB of n is 1, white/black reverse printing mode is turned on.

[Notes] • Only the LSB of nis effective.

• This command is available for built-in characters and user-defined characters.

• This command does not affect bit image, downloaded bit image, bar codes, HRI characters and spacing skipped by $09, $1B $24 and $1B $5C.

• This command does not affect the space between lines.

• White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not cancelled) when white/black reverse mode is selected.

[Default] n = 0

[Reference]

[Example]

$1D $43 $30 n m

[Name]	**Select counter print mode.**				
[Format]	ASCII	GS	C	0	n	m
	Hex	1D	43	30	n	m
	Decimal	29	67	48	n	m
[Range]	0 ≤ n ≤ 5				
	m = 0, 1, 2, 48, 49, 50				
[Description]	Selects a print mode for the serial number counter.				

• n specifies the number of digits to be printed as follows:

when n = 0, the printer prints the actual digits indicated by the number value.

when n = 1 to 5, this command sets the number of digits to be printed.

• m specifies the printing position within the entire range of printed digits, as follows:

m	PRINTING POSITION	PROCESSING OF DIGITS LESS THAN THOSE SPECIFIED
0, 48	Align right	Adds spaces to the left.
1, 49	Align right	Adds '0' to the left.
2, 50	Align left	Adds spaces to the right

[Notes] • If n or m is out of the defined range, the previously set print mode is not changed.

• If n = 0, m does not have any meaning.

[Default] n = 0, m = 0

[Reference] $1D $43 $31, $1D $43 $32, $1D $43 $3B, $1D $63

[Example]

n = 3,m = 0	n = 3, m = 1	n = 3, m=2
□ □ 1	001	1 □ □

□ indicates a space

$1D $43 $31 aL aH bL bH n r

[Name]	**Select count mode (A).**								
[Format]	ASCII	GS	C	1	aL	aH	bL	bH	n	r
	Hex	1D	43	31	aL	aH	bL	bH	n	r
	Decimal	29	67	49	aL	aH	bL	bH	n	r

[Range]   0 ≤ aL, aH ≤ 255
                  0 ≤ bL, bH ≤ 255
                  0 ≤ n, r ≤ 255

[Description]   Selects a count mode for the serial number counter.
• aL, aH o bL, bH specify the counter range.
• n specify the stepping amount when counting up or down.
• r indicates the repetition number when the counter value is fixed.

[Notes]   • Count-up mode is specified when:
[aL + (aH * 256)] < [bL + (bH * 256)] and n ≠ 0 and r ≠ 0
• Count-down mode is specified when:
[aL + (aH * 256)] > [bL + (bH * 256)] and n ≠ 0 and r ≠ 0
• Counting stops when:
[aL + (aH * 256)] = [bL + (bH * 256)] or n = 0 or r = 0
• In setting count-up mode, the minimum value of the counter is [aL + (aH * 256)] and the maximum value is [bL + (bH * 256)]. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value.
• In setting count-down mode, the maximum value of the counter is [aL + (aH * 256)] and the minimum value is [bL + (bH * 256)]. If counting down reaches a value less than minimum, it is resumed with the maximum value.
• When the command is executed, the internal count that indicates the repetition number specified by r is cleared.

[Default]   aL = 1, aH = 0, bL = 255, bH = 255, n = 1, r = 1
[Reference] $1D $43 $30, $1D $43 $32, $1D $43 $3B, $1D $63
[Example]

$1D $43 $32 nL nH

[Name]	**Set counter.**					
[Format]	ASCII	GS	C	2	nL	nH
	Hex	1D	43	32	nL	nH
	Decimal	29	67	50	nL	nH

[Range]   0 ≤ nL, nH ≤ 255
[Description]   Sets the serial number counter value.
• nL and nH determine the value of the serial number counter set by [nL + (nH * 256)].

[Notes]   • In count-up mode, if the counter value specified by this command goes out of the counter operation range specified by $1D $43 $31 or $1D $43 $3B, it is forced to convert to the minimum value by $1D $63.
• In count-down mode, if the counter value specified by this command goes out of the counter operation range specified by $1D $43 $31 or $1D $43 $3B, it is forced to convert to the maximum value by $1D $63.

[Default]   nL = 1, nH = 0
[Reference] $1D $43 $30, $1D $43 $31, $1D $43 $3B, $1D $63
[Example]

$1D $43 sa $3B sb $3B sn $3B sr $3B sc $3B

[Name]	**Select count mode (B).**													
[Format]	ASCII	GS	C	;	sa	;	sb	;	sn	;	sr	;	sc	;
	Hex	1D	43	3B	sa	3B	sb	3B	sn	3B	sr	3B	sc	3B
	Decimal	29	67	59	sa	59	sb	59	sn	59	sr	59	sc	59

[Range] $0 \leq sa, sb, sc \leq 65535$
$0 \leq sn, sr \leq 255$
These values are all character strings.

[Description] Selects a count mode for the serial number counter and specifies the value of the counter.
• sa, sb, sn, sr and sc are all displayed in ASCII characters using the codes from 'O' to '9'.
• sa and sb specify the counter range.
• sn indicates the stepping amount for counting up or down.
• sr indicates the repetition number with the counter value fixed.
• sc indicates the counter value.

[Notes]   • Count-up mode is specified when:
sa < sb and sn ≠ 0 and sr ≠ 0
• Count-down mode is specified when:
sa > sb and sn ≠ 0 and sr ≠ 0
• Counting stops when:
sa = sb or sn = 0 or sr = 0
• In setting count-up mode, the minimum value of the counter is sa and the maximum is sb. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the minimum value by executing $1D $63.
• In setting count-down mode, the maximum value of the counter is sa and the minimum value is sb. If counting down reaches a value less than the minimum, it is resumed with the maximum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the maximum value by executing $1D $63.
• Parameters sa to sc can be omitted. If omitted, these values remain unchanged.
• Parameters sa to sc must not contain characters, with the exception of those from '0' to '9'.

[Default]   sa = 1, sb = 65535, sn = 1, sr = 1, sc = 1
[Reference] $1D $43 $30, $1D $43 $31, $1D $43 $32, $1D $63
[Example]

$1D $48 n

[Name]	**Select printing position of Human Readable Interpretation (HRI).**			
[Format]	ASCII	GS	H	n
	Hex	1D	48	n
	Decimal	29	72	n

[Range] $0 \leq n \leq 3, 48 \leq n \leq 51$
[Description] Selects the printing position of HRI characters when printing bar code.
n selects the printing position as follows:

n	FUNCTION
0, 48	Not printed
1, 49	Above the bar code.
2, 50	Below the bar code.
3, 51	Both above and below the bar code

[Notes]   • HRI characters are printed using the font specified by $1D $66.
[Default]   n = 0
[Reference] $1D $66, $1D $6B
[Example]

$1D $49 n

[Name]	**Transmit printer ID.**
[Format]	ASCII GS I n
	Hex 1D 49 n
	Decimal 29 73 n
[Range]	1 ≤ n ≤ 3, 49 ≤ n ≤ 51
[Description]	Transmits the printer ID specified by n as follows:

n	PRINTER ID	SPECIFICATION
1, 49	Printer model ID	$93 (TG2480)
2, 50	Type ID	Refer to table below
3, 51	ROM version ID	Depends on ROM version (4 char)

n = 2, 50 Identification Function

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	2-byte character codes not supported
1	Off	00	0	Auto-cutter not supplied
	On	02	2	Auto-cutter supplied
2	Off	00	0	Non-label thermal paper
	On	04	4	Label thermal paper
3	-	-	-	RESERVED
4	Off	00	0	Fixed to Off
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	Off	00	0	Fixed to Off

[Notes]	• When the DTR/DSR control is selected, the printer only transmits 1 byte (Printer identification) after it has been given confirmation that the host is ready to receive data. If the host is not ready, the printer waits until it is.
	• When the XON/XOFF control is selected, the printer only transmits 1 byte (Printer identification) if it has not been given confirmation that the host is ready to receive data.
	• This command is carried out once the data has been processed in the reception buffer. There may therefore be a delay between the moment in which the command is received and that in which the data is transmitted, depending on the status of the reception buffer.
[Default]	
[Reference]	
[Example]	

$1D $4C nL nH

[Name]	**Set left margin.**				
[Format]	ASCII	GS	L	nL	nH
	Hex	1D	4C	nL	nH
	Decimal	29	76	nL	nH
[Range]	$0 \leq nL, nH \leq 255$				
[Description]	Sets the left margin.				

• The left margin is set at [(nL + nH * 256) * (horizontal motion unit)] inches.

Printable area

Left margin   **Printing area width**
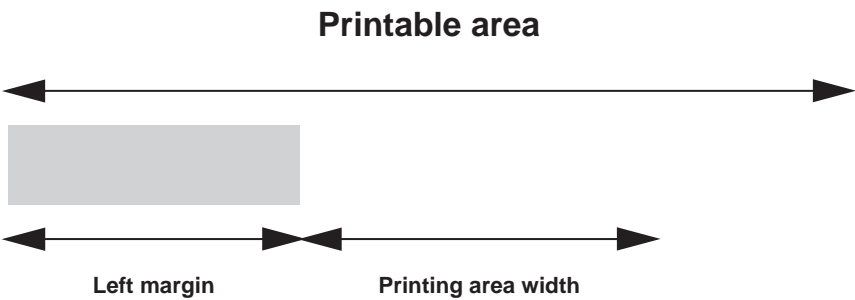
[Notes]
• This command is enabled only at the beginning of the line.
• If the setting exceeds the printable area, the maximum value of the printable area is used.
• If left margin + printing area width is greater than printable area, then printing area width is set at maximum value.
• The horizontal and vertical motion units are specified by $1D $50. Changing the horizontal or vertical motion unit does not affect the current left margin.
• The command $1D $50 can change the horizontal (and vertical) motion unit.
• However, the value cannot be less than the minimum horizontal movement amount and it must be expressed in even units of the minimum horizontal movement amount.

[Default]   If Font A :   nL = nH = 0
            If Font B :   nL =14
                          nH = 0

[Reference] $1D $50, $1D $57
[Example]

$1D $50 x y

[Name]	**Set horizontal and vertical motion units.**				
[Format]	ASCII	GS	P	x	y
	Hex	1D	50	x	y
	Decimal	29	80	x	y
[Range]	x = 100, 200				
	y = 100, 200				

[Description]   Sets the horizontal and vertical motion units at 1/x inches and 1/y inches, respectively.
When x is set at 0, the default setting value is used.
When y is set at 0, the default setting value is used.

[Notes]
• The horizontal direction is perpendicular to the paper feed direction.
• In standard mode, the following commands use x or y, irrespective of character rotation (upside down or 90° clockwise rotation):

① Commands using x : $1B $20, $1B $24, $1B $5C, $1D $4C, $1D $57.
② Commands using y : $1B $33, $1B $4A.

• This command does not affect the previously specified values.
• The calculated result from combining this command with others is truncated to the minimum value of the mechanical pitch or an exact multiple of that value.

[Default]	x = 200, y = 200
[Reference]	$1B $20, $1B 24, $1B $5C, $1B $33, $1B $4A, $1D $4C, $1D $57
[Example]	

$1D $57 nL nH

[Name]	**Set printing area width.**				
[Format]	ASCII	GS	W	nL	nH
	Hex	1D	57	nL	nH
	Decimal	29	87	nL	nH
[Range]	0 ≤ nL, nH ≤ 255				
[Description]	Sets the printing area width to the area specified by nL and nH.				

• The left margin is set at [(nL + nH * 256) * (horizontal motion unit)] inches.

Printable area

Left margin   **Printing area width**
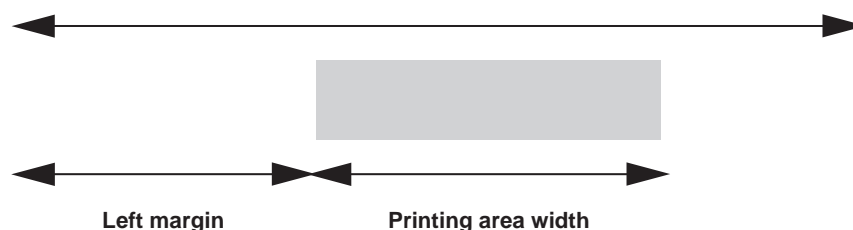
[Notes]	• This command is only enabled at the beginning of the line.
	• If right margin is greater than printable area, then the printing area width is set at maximum value.
	• If printing area width = 0, then it is set at maximum value.
	• The horizontal and vertical motion unit are specified by $1D $50. Changing the horizontal or vertical motion unit does not affect the current left margin.
	• The command $1D $50 can change the horizontal (and vertical) motion unit.
	• However, the value cannot be less than the minimum horizontal movement amount and it must be expressed in even units of the minimum horizontal movement amount.

[Default]	If Font A :	nL = 192
		nH = 1
	If Font B :	nL =164
		nH = 1
[Reference]	$1D $4C, $1D $50	
[Example]		

$1D $5E r t m

[Name]	**Execute macro.**				
[Format]	ASCII	GS	^	r	t	m
	Hex	1D	5E	r	t	m
	Decimal	29	94	r	t	m
[Range]	0 ≤ r, t ≤ 255				
	0 ≤ m ≤ 1				
[Description]	Executes a macro.				

• r specifies the number of times to execute the macro.
• t specifies the waiting time for executing the macro.
The waiting time is t * 100 msec. for every macro execution.
• m specifies macro executing mode:
When the LSB of m = 0, the macro executes r times continuously at the interval specified t.
When the LSB of m = 1, after waiting for the period specified by t, the LED indicator blinks and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation r times.

[Notes]	• This command lasts for a period of (t * 100 msec.) after a macro is executed by t.
	• If this command is received while a macro is being defined, the macro definition is aborted and the definitions cleared.
	• If the macro is not defined or if r is 0, nothing happens.
	• When the macro is executed by pressing the FEED button (m = 1), the paper can not be fed by using the FEED button.
[Default]	
[Reference]	$1D $3A
[Example]	

$1D $63

[Name]	**Print counter.**
[Format]	ASCII GS c
	Hex 1D 63
	Decimal 29 99
[Description]	Sets the serial counter value in the print buffer and increments or decrements the counter value.
[Notes]	• After setting the current counter value in the print buffer as print data (a character string), the printer counts up or down based on the count mode set. The counter value in the print buffer is printed when the printer receives a print command or is in the buffer full state.
	• The counter print mode is set by $1D $43 $30.
	• The counter mode is set by $1D $43 $31 or $1D $43 $3B.
	• In count-up mode, if the counter value set by this command goes out of the counter operation range set by $1D $43 $31 or $1D $43 $3B, it is forced to convert to the minimum value.
	• In count-down mode, if the counter value set by this command goes out of the counter operation range set by $1D $43 $31 or $1D $43 $3B, it is forced to convert to the maximum value.
[Default]	
[Reference]	$1D $43 $30, $1D $43 $31, $1D $43 $32, $1D $43 $3B
[Example]	

$1D $66 n

[Name]	**Select font for HRI characters.**
[Format]	ASCII GS f n
	Hex 1D 66 n
	Decimal 29 102 n
[Range]	n = 0, 1, 48, 49
[Description]	Selects a font for the HRI characters used when printing a bar code.
	n selects a font from the following table:

n	FONT
0, 48	Font A.
1, 49	Font B

[Notes]	The HRI characters are printed at the position specified by the command $1D $48.
[Default]	n = 0
[Reference]	$1D $48, $1D $6B
[Example]	

$1D $68 n

[Name]	**Set bar code height.**
[Format]	ASCII GS h n
	Hex 1D 68 n
	Decimal 29 104 n
[Range]	$1 \le n \le 255$
[Description]	Sets the height of the bar code. n specifies the number of dots in the vertical direction.
[Notes]	
[Default]	n = 96 (12 mm)
[Reference]	$1D $6B
[Example]	

$1D $6B m 00

[Name]	**Print bar code.**
[Format]	① ASCII GS k m NUL
	Hex 1D 6B m 00
	Decimal 29 107 m 0
	② ASCII GS k m n
	Hex 1D 6B m n
	Decimal 29 107 m n
[Range]	① $0 \le m \le 6$
	② $65 \le m \le 73$
[Description]	Selects a bar code system and prints the bar code. m selects a bar code system as follows:

	m	BARCODE SYSTEM	No. OF CHARACTERS	REMARKS
①	0	UPC-A	$11 \le k \le 12$	$48 \le d \le 57$
	1	UPC-E	$11 \le k \le 12$	$48 \le d \le 57$
	2	EAN13 (JAN)	$12 \le k \le 13$	$48 \le d \le 57$
	3	EAN8 (JAN)	$7 \le k \le 8$	$48 \le d \le 57$
	4	CODE39	$1 \le k$	$48 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37, 43, 45, 46, 47
	5	ITF	$1 \le k$ (even number)	$48 \le d \le 57$
	6	CODABAR	$1 \le k$	$48 \le d \le 57$, $65 \le d1 \le 68$, 36, 43, 45, 46, 47, 58
	7	CODE93	$1 \le k \le 255$	$1 \le d \le 127$
	8	CODE128	$2 \le k \le 255$	$1 \le d \le 127$
	20	CODE32	$8 \le k \le 9$	$48 \le d \le 57$

	m	BARCODE SYSTEM	No. OF CHARACTERS	REMARKS
②	65	UPC-A	$11 \le n \le 12$	$48 \le d \le 57$
	66	UPC-E	$11 \le n \le 12$	$48 \le d \le 57$
	67	EAN13 (JAN)	$12 \le n \le 13$	$48 \le d \le 57$
	68	EAN8 (JAN)	$7 \le n \le 8$	$48 \le d \le 57$
	69	CODE39	$1 \le n \le 255$	$48 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37, 43, 45, 46, 47
	70	ITF	$1 \le n \le 255$	$48 \le d \le 57$
	71	CODABAR	$1 \le n \le 255$	$48 \le d \le 57$, $65 \le d1 \le 68$, 36, 43, 45, 46, 47, 58
	72	CODE93	$1 \le n \le 255$	$1 \le d \le 127$
	73	CODE128	$2 \le n \le 255$	$1 \le d \le 127$
	90	CODE32	$8 \le n \le 9$	$48 \le d \le 57$

[Notes]
• If d is outside the specified range, the printer prints the following message: "BAR CODE GENERATOR NON OK !" and processes the following data as normal data.
• If the horizontal size exceeds the printing area, the printer only feeds the paper.
• This command feeds as much paper as is required to print the bar code, irrespective of the line spacing specified by $1B $32 or $1B $33.
• After printing the bar code, this command sets the print position at the beginning of the line.
• This command is not affected by print modes (bold, double strike, underline or character size), with the exception of upside-down mode and justification.

[Note for ①]
• This command ends with a $00 code.
• When the bar code used is UPC-A or UPC-E, the printer prints the bar code data after receiving 11 (without check digit) or 12 (with check digit) byte bar code data.
• When the bar code system used is EAN13, the printer prints the bar code after receiving 12 (without check digit) or 13 (with check digit) byte bar code data.
• When the system used is EAN8, the printer prints the bar code after receiving 7 (without check digit) or 8 (with check digit) byte bar code data.
• The number of data for ITF bar code must be even. When an odd number of data is input, the printer ignores the last received data.

[Note for ②]
• If n is outside the specified range, the printer stops command processing and process the following data as normal data.

When to use CODE93:
• The printer prints an HRI character (o) as a start character at the beginning of the HRI character string.
• The printer prints an HRI character (o) as a stop character at the end of the HRI character string.
• The printer prints an HRI character (n) as a control character ($00 to $1F and $7F).

When to use CODE128:
• When using the CODE128 in this printer, take the following points into account for data transmission:
• The top of the bar code data string must be a code set selection character (CODE A , CODE B or CODE C) which selects the first code set.
• Special characters are defined by combining two characters "{" and one character. The ASCII character "{" is defined by transmitting "{" twice consecutively.

SPECIFIC CHARACTER	DATA TRANSMISSION		
	ASCII	HEX	DECIMAL
SHIFT	{S	7B, 53	123, 83
CODE A	{A	7B, 41	123, 65
CODE B	{B	7B, 42	123, 66
CODE C	{C	7B, 43	123, 67
FNC1	{1	7B, 31	123, 49
FNC2	{2	7B, 32	123, 50
FNC3	{3	7B, 33	123, 51
FNC4	{4	7B, 34	123, 52
'{'	{{	7B, 7B	123, 123

[Default]
[Reference] $1D $48, $1D $66, $1D $68, $1D $77
[Example]

$1D $72 n

[Name]	**Transmit status.**			
[Format]	ASCII	GS	r	n
	Hex	1D	72	n
	Decimal	29	114	n
[Range]	n = 1, n = 49			
[Description]	Transmits the status specified by n as follows:			

n	FUNCTION
1, 49	Transmits paper sensor status (same as $1B $76).

BIT	OFF/ON	HEX	Decimal	FUNCTION
0,1	-	-	-	RESERVED
	-	-	-	RESERVED
2,3	Off	00	0	Paper end sensor: aper present
	On	0C	12	Paper end sensor: paper not present
4	Off	00	0	Fixed to Off
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	Off	00	0	Fixed to Off

[Notes] • This command is executed when the data is processed in the reception buffer. There may therefore be a time lag between receiving the command and transmitting the status, depending on the status of the reception buffer.

[Default]
[Reference] $10 $04, $1B $75, $1B $76
[Example]

$1D $77 n

[Name]	**Set bar code width.**			
[Format]	ASCII	GS	w	n
	Hex	1D	77	n
	Decimal	29	119	n
[Range]	2 ≤ n ≤ 6			
[Description]	Sets the horizontal size of the bar code. n specifies the bar code width as follows:			

n	MODULE WIDTH (mm)
2	0.25
3	0.375
4	0.5
5	0.625
6	0.75

[Notes]
[Default] n = 3
[Example]

$1D $7E n

[Name]	**Set superscript / subscript.**		
[Format]	ASCII	GS	{ }	n
	Hex	1D	7E	n
	Decimal	29	126	n

[Range]   n = 0, 1, 48, 49
[Description] Sets superscript or subscript character position.
              n specifies the position as follows:

n	FUNCTION
0, 48	Subscript character position
1, 49	Superscript character position

[Notes]   • This command is executed if there are characters with different heights on the same line.
[Default]   n = 0
[Reference] $1B $21, $1D $21
[Example]

$1D $7C n

[Name]	**Set printing density.**		
[Format]	ASCII	GS	{ }	n
	Hex	1D	7C	n
	Decimal	29	124	n

[Range]   0 ≤ n ≤ 4, 48 ≤ n ≤ 52
[Description] Sets the printing density. n specifies the printing density as follows:

n	PRINTING DENSITY
0, 48	Very light
1, 49	Light
2, 50	Normal
3, 51	Dark
4, 52	Very dark

[Notes]   • The printing density is cleared at default value when the printer is reset or the power is turned off.
[Default]   n = 2
[Reference]
[Example]

3.2.2 Custom emulation

The following table lists all the commands for the management of the Custom emulation. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously transmitted have been carried out. There are no priority commands; all commands are carried out when the circular buffer is free to do so.

COMMAND TABLE (Tab.3.2)

Com. HEX	Com. ASCII	Description
$00	NUL	Printing with small characters
$01	SOH	Printing with double width characters
$02	STX	Printing in double height characters
$03	ETX	Printing with expanded characters
$04	EOT	Printing with small characters
$0A	LF	Print and line feed
n $0B	n VT	Vertical tabs
$0D	CR	Print and feed
$0F	SI	Ignore $0D
$11	DC1	DP 24/40 graphic mode
$1B $21 n	ESC ! n	Set print mode
$1B $24 nL nH	ESC $ nL nH	Set absolute print position
$1B $2A m nL nH d1...dk	ESC * m nL nH d1...dk	Set bit image mode
$1B $40	ESC @	Initialize printer
$1B $42	ESC B	Select FONT 1
$1B $43	ESC C	Total cut
$1B $4B $0D	ESC K [d] CR	Set characters to transmit on pressing Print key
dH dL $1B $47	dH dL ESC G	Set default parameters
dH dL $1B $4D	dH dL ESC M	Set default parameters of print mode
$1B $4E	ESC N	Set printing in NORMAL
$1B $52	ESC R	Set printing in REVERSE
$1B $56n	ESC V n	Set print mode rotated by 90°
$1B $61 n	ESC a n	Select justification
$1B $62	ESC b	Set FONT 2
$1B $6D	ESC m	Read default parameters of print mode
$1B $70	ESC p	Read default parameters
aH aL $1B $72	aH aL ESC r	Read EEPROM position
$1B $74 n	ESC t n	Select character code table
aH aL dH dL $1B $77	aH aL dH dL ESC w	Write EEPROM position
$1B $FA n xH xL yH yL	ESC · n xH xL yH yL	Print graphic bank
$1B $FF m nL nH d0...dn	ESC { } m nL nH d0...dn	Receive and store logos in Flash
$1C $C0 $AA $0F $EE $0B $34	FS { } { } SI { } VT 4	Total cut and automatic paper moving back
$1D $0C	GS FF	Print the buffer contents
$1D $3A	GS :	Starting / end macro definition
$1D $43 $30 n m	GS C 0 n m	Set counter print mode
$1D $43 $31 aL aH bL bH n r	GS C 1 aL aH bL bH n r	Select count mode (A)
$1D $43 $32 nL nH	GS C 2 nL nH	Set counter

$1D $43 $3B sa $3B sb $3B sn $3B sr $3B sc $3B	GS C ; sa ; sb ; sn ; sr ; sc ;	Select count mode (B)
$1D $48 n	GS H n	Select printing position of HRI characters
$1D $49 n	GS I n	Transmit printer ID
$1D $50 x y	GS P x y	Set horizontal and vertical motion units
$1D $5E r t m	GS ^ r t m	Execute macro
$1D $63	GS c	Print counter
$1D $66 n	GS f n	Select font for HRI characters
$1D $68 n	GS h n	Set bar code height
$1D $6B m 00	GS k m NUL	Print bar code
$1D $77 n	GS w n	Set bar code width
$1D $7C n	GS | n	Set printing density

The following pages provide a more detailed description of each command.

$00

[Name]	**Print with small character.**	
[Format]	ASCII	NUL
	Hex	00
	Decimal	0
[Description]	Character printing is executed in small format (normal).	
[Notes]	• Setting remains until the next set.	
[Default]	Set up from front keys.	
[Reference]	$01, $02, $03, $04	
[Example]		

$01

[Name]	**Printing with double width character.**	
[Format]	ASCII	SOH
	Hex	01
	Decimal	1
[Description]	Printing of the character is executed in double width format.	
[Notes]	• Setting remains until next set.	
[Default]	Set up from front keys.	
[Reference]	$00, $02, $03, $04	
[Example]		

$02

[Name]	**Printing in double height character.**	
[Format]	ASCII	STX
	Hex	02
	Decimal	2
[Description]	Printing of the character is executed in double height format.	
[Notes]	• Setting remains until next set.	
[Default]	Set up from front keys.	
[Reference]	$00, $01, $03, $04	
[Example]		

$03

[Name]	**Printing with expanded character.**	
[Format]	ASCII	ETX
	Hex	03
	Decimal	3
[Description]	Printing of the character is executed in expanded format.	
[Notes]	• Setting remains until next set.	
[Default]	Set up from front keys.	
[Reference]	$00, $01, $02, $04	
[Example]		

$04

[Name]	**Printing with small character.**	
[Format]	ASCII	EOT
	Hex	04
	Decimal	4
[Description]	Character printing is executed in small format (normal).	
[Notes]	• Setting remains until next set.	
[Default]	Set up from front keys.	
[Reference]	$00, $01, $02, $03	
[Example]		

$0A

[Name]	**Print and line feed.**	
[Format]	ASCII	LF
	Hex	0A
	Decimal	10
[Description]	Prints the data in the buffer and feeds one line, based on the current line spacing.	
[Notes]	• The command sets the print position at the beginning of the line.	
[Default]		
[Reference]	$1B $32, $1B $33	
[Example]		

n $0B

[Name]	**Vertical tabs.**	
[Format]	ASCII	n	VT
	Hex	n	0B
	Decimal	n	11
[Range]	$0 < n \leq 9$	
[Description]	Runs as many feeds as are defined by n.	
[Notes]	• This command zeroes the line buffer.	
[Default]		
[Reference]		
[Example]		

$0D

[Name]	**Print and feed.**	
[Format]	ASCII	CR
	Hex	0D

	Decimal 13
[Description]	This command prints the data in the buffer.
[Notes]	• This command sets the print position at the beginning of the line.
[Default]	
[Reference]	$0A
[Example]	

$0F

[Name]	**Ignore $0D.**
[Format]	ASCII SI
	Hex 0F
	Decimal 15
[Description]	After this command the CR code is ignored.
[Notes]	• To put the CR code back into operation, reset the printer.
[Default]	
[Reference]	
[Example]	

$11

[Name]	**DP24/40 graphic mode.**
[Format]	ASCII DC1
	Hex 11
	Decimal 17
[Description]	Prints in graphic mode like the DP 24/40.
	The command $11 enables the DP24-40 printer graphic mode, i.e. to print in graphic mode, transmit the command $11 at the beginning of each line. One line for the DP24-40 printer (24 column model) corresponds to 144 horizontal dots divided into 24 6-dot blocks. For the DP24-40 printer (40-column model) one line corresponds to 240 horizontal dots divided into 40 6-dot blocks.
[Notes]	The size of the graphic dot and the number of dots per line vary depending on the number of columns.
	To obtain a graphic printout, enter the command $11 at the beginning of each line. The graphic configuration byte format is as follows:

X	R	P6	P5	P4	P3	P2	P1
D7	D6	D5	D4	D3	D2	D1	D0

where:

X is not utilized (we recommend 0);
R must be set at 1;
P1, P6 are the data of the graphic dots (1 prints, 0 does not print).
The P6 bit of the string of dots transmitted, is printed on the left and the others (P5, P4, P3, P2, P1) follow from left to right as shown:

1° byte →	2° byte →	3° byte →
P6 P5 P4 P3 P2 P1	P6 P5 P4 P3 P2 P1	P6 P5 P4 P3 P2 P1

[Default]	
[Reference]	
[Example]	To print a line of dots, transmit: $11, n x $7F (where n is the number of characters per line), $0D.
	To print an empty line, transmit: $11, n x $40, $0D.

$1B $21 n

[Name]	**Select print mode.**			
[Format]	ASCII	ESC	!	n
	Hex	1B	21	n
	Decimal	27	33	n
[Range]	0 ≤ n ≤ 255			
[Description]	Selects the print mode using n (see following tables):			

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Character font A selected.
	On	01	1	Character font B selected.
1	-	-	-	RESERVED.
2	-	-	-	RESERVED.
3	Off	00	0	Bold mode not selected.
	On	08	8	Bold mode selected.
4	Off	00	0	Double height mode not selected.
	On	10	16	Double height mode selected.
5	Off	00	0	Double width mode not selected.
	On	20	32	Double width mode selected.
6	Off	00	0	Script mode not selected.
	On	40	64	Script mode selected.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

[Notes]
- The printer can underline all the characters, but it cannot underline the space set by command $1B $24 and 90° clockwise rotated characters.
- When the characters on the same line are enlarged to different heights, they are either aligned at the baseline or topline.
- This command resets the left and right margin at the default value.

[Default]   n = 0
[Reference]
[Example]

$1B $24 nL nH

[Name]	**Set absolute print position.**			
[Format]	ASCII	ESC	$	nL nH
	Hex	1B	24	nL nH
	Decimal	27	36	nL nH

[Range]   0 ≤ nL ≤ 255
           0 ≤ nH ≤ 255

[Description] Sets the distance from the beginning of the line to the position in which the subsequent characters are to be printed.
The distance from the beginning of the line to the print position is [(nL + nH * 256) * (vertical or horizontal motion unit)] inches.

[Notes]
- Settings outside the specified printable area are ignored.
- The vertical and horizontal motion units are specified by $1D $50.
- The command $1D $50 can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.
- In standard mode the horizontal motion unit (x) is used.
- If the setting is outside the printing area width, set absolute print position, but left or right margin is set at default value.

[Default]
[Reference] $1D $50
[Example]

$1B $2A m nL nH d1...dk

[Name]	**Set bit image mode.**					
[Format]	ASCII	ESC	*	m	nL	nH	d1...dk
	Hex	1B	2A	m	nL	nH	d1...dk
	Decimal	27	42	m	nL	nH	d1...dk

[Range] m = 0, 1, 32, 33
$0 \leq nL \leq 255$
$0 \leq nH \leq 1$
$0 \leq d \leq 255$

[Description] Selects a bit image-mode using m for the number of dots specified by nL and by nH, as follows:

m	Mode	Vertical direction		Horizontal direction (*1)	
		N° dots	DPI	DPI	N° data (k)
0	8 dots single density	8	67	100	nL + nH x 256
1	8 dots double density	8	67	200	nL + nH x 256
32	24 dots single density	24	200	100	(nL + nH x 256) x 3
33	24 dots double density	24	200	200	(nL + nH x 256) x 3

[Notes]
• The commands nL and nH indicate the number of horizontal dots in the graphic image. The nL and nH indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by nL + nH * 256.
• If the bit image data exceeds the number of dots to be printed on a line, the excess data is ignored.
• d indicates the bit image data. Set a corresponding bit at 1 to print dot or at 0 not to print dot.
• If the value of m is outside the specified range, nL and the data following are processed as normal data.
• To print the bit-image, use the commands $0A or $0D.
• After printing a bit image, the printer reverts to normal data processing mode.
• This command is not affected by bold, double strike, underlining (etc.) modes, with the exception of upside down mode.
The relationship between the image data and the dots to be printed is as follows:

8 dot image   24 dot image

[Default]
[Reference]
[Example]

CUSTOM
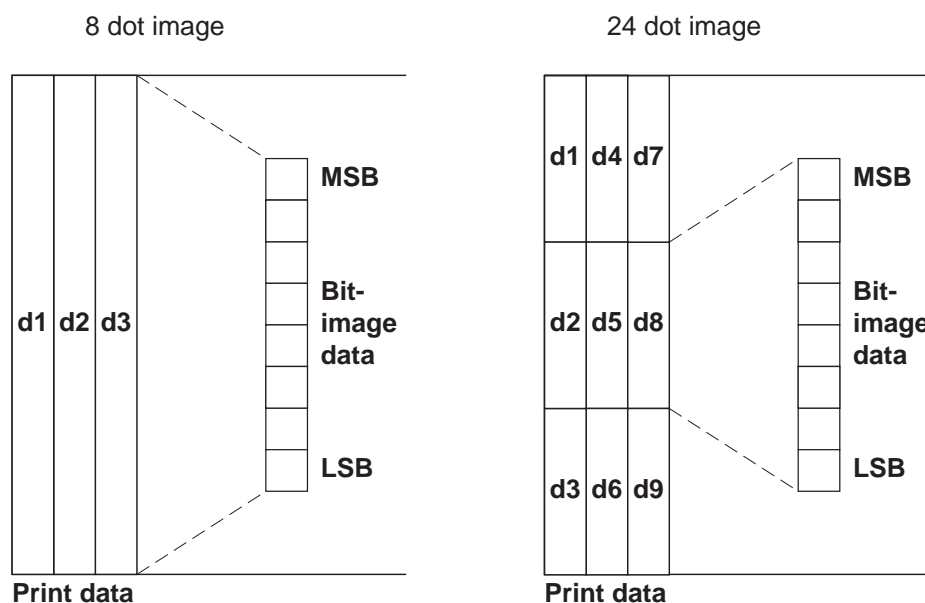
$1B $40

[Name]	**Inizialize printer.**		
[Format]	ASCII	ESC	@
	Hex	1B	40
	Decimal	27	64
[Description]	Clears the data in the print buffer and resets the printer mode to the one that was in effect when the power was turned on.		
[Notes]	• Same as hardware reset.		
[Default]			
[Reference]			
[Example]			

$1B $42

[Name]	**Select FONT 1.**		
[Format]	ASCII	ESC	B
	Hex	1B	42
	Decimal	27	66
[Description]	Select FONT 1.		
[Notes]	• Setting remains until next set.		
[Default]	Set up from front keys.		
[Reference]	$1B $62		
[Example]			

$1B $43

[Name]	**Total cut.**		
[Format]	ASCII	ESC	C
	Hex	1B	43
	Decimal	27	67
[Description]	This command enables cutter operation; if there is no cutter, a disabling flag is set and any subsequent cutting commands will be ignored.		
[Notes]	• The printer waits until all the paper movement commands have been completed before executing total cut.		
[Default]			
[Reference]			
[Example]			

$1B $4B $0D

[Name]	**Set the characters to transmit on pressing the Print key.**		
[Format]	ASCII	ESC	K	CR
	Hex	1B	4B	0D
	Decimal	27	75	13
[Description]	Saves characters to transmit on pressing Print key.		
	"d" is the ASCII string to transmit, terminating with $0D. To deactivate this function, transmit a $00.		
[Notes]	• The maximum number of characters to transmit is 24 (with $0D at the end).		
[Default]	d = 13		
[Reference]			
[Example]			

dH dL $1B $47

[Name]	**Set default parameters.**				
[Format]	ASCII	dH	dL	ESC	G
	Hex	dH	dL	1B	47
	Decimal	dH	dL	27	71
[Range]	0 ≤ dH, dL ≤ 255				
[Description]	Sets default parameters as indicated as follows:				

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	NORMAL printing mode
	On	01	1	REVERSE printing mode
1	Off	00	0	$0D command executed
	On	02	2	$0D command ignored
2	Off	00	0	Horizontal printing
	On	04	4	Vertical printing
3	Off	00	0	doesn't execute centered printing
	On	08	8	executes centered printing
4	Off	00	0	Aligns print to left
	On	10	16	Align print to right
5	Off	00	0	Fixed to Off
6	Off	00	0	Deactivates underlining
	On	40	64	Activates underlining
7	Off	00	0	Deactivates bold printing
	On	80	128	Activates bold printing

[Notes]	Setting is memorized in EEPROM.
[Default]	Set up from front keys.
[Reference]	
[Example]	If dH = '4' and dL = 'D' the value of d is 77 ($4D)

dH dL $1B $4D

[Name]	**Set default parameters of print mode.**				
[Format]	ASCII	dH	dL	ESC	M
	Hex	dH	dL	1B	4D
	Decimal	dH	dL	27	77
[Description]	Sets the default parameters of print mode as indicated as follows:				
	$00: small print				
	$01: double width printing				
	$02: double height printing				
	$03: bold printing				
[Notes]	Setting is memorized in EEPROM.				
[Default]	Set up from front keys.				
[Reference]					
[Example]	If dH = 'A' and dL = '3' the value of d is 163 ($A3)				

$1B $4E

[Name]	**Set printing in NORMAL.**
[Format]	ASCII ESC N
	Hex 1B 4E
	Decimal 27 78
[Description]	Selects printing in NORMAL mode.
[Notes]	• Setting remains until next set.
[Default]	Set up from front keys.
[Reference]	$1B $52
[Example]	

$1B $52

[Name]	**Set printing in REVERSE.**
[Format]	ASCII ESC R
	Hex 1B 52
	Decimal 27 82
[Description]	Set printing in REVERSE mode.
[Notes]	• Setting remains until next set.
[Default]	Set up from front keys.
[Reference]	$1B $4E
[Example]	

$1B $56 n

[Name]	**Set print mode rotated by 90°.**
[Format]	ASCII ESC V n
	Hex 1B 56 n
	Decimal 27 86 n
[Range]	$0 \leq n \leq 1$
	$48 \leq n \leq 49$
[Description]	Enable / disable print mode rotated by 90°. n is used as follows:

n	FUNCTION
0, 48	Turns off 90° rotation mode
1,49	Turns on 90° rotation mode

[Notes]	• When underlined mode is turned on, the printer does not underline 90° rotated characters. All the same it's possible select the underline mode.
	• Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double-height and double-width commands in normal mode.
	• This command is not available in Page mode.
	• If this command is entered in Page mode, the printer all the same save the setting.
Default]	n = 0
[Reference]	$1B $21 , $1B $2D
[Example]	

$1B $61 n

[Name]	**Select justification.**
[Format]	ASCII ESC a n
	Hex 1B 61 n
	Decimal 27 97 n
[Range]	0 ≤ n ≤ 2, 48 ≤ n ≤ 50
[Description]	Aligns all the data in one line in the position specified. n selects the type of justification as follows:

n	JUSTIFICATION
0, 48	Left justification
1, 49	Centering
2, 50	Right justification

[Notes]	• This command is only enabled if input at the beginning of the line.
	• The lines are justified within the specified printing area.
	• The spaces set by the command $1B $24 remain justified as per the previously set mode.
[Default]	n = 0
[Reference]	
[Example]	

Left justification	Centering	Right justification
ABC ABCD ABCDE	ABC ABCD ABCDE	ABC ABCD ABCDE

$1B $62

[Name]	**Select FONT 2.**
[Format]	ASCII ESC b
	Hex 1B 62
	Decimal 27 98
[Description]	Select FONT 2.
[Notes]	• Setting remains until next set.
[Default]	Set up from front keys.
[Reference]	$1B $42
[Example]	

$1B $6D

[Name]	**Read default parameters of print mode.**
[Format]	ASCII ESC m
	Hex 1B 6D
	Decimal 27 109
[Description]	Reads default parameters of print mode.
[Notes]	See ESC M.
[Default]	Set up from front keys.
[Reference]	$1B $4D
[Example]	

$1B $70

[Name]	**Read default parameters.**
[Format]	ASCII ESC p
	Hex 1B 70
	Decimal 27 112
[Description]	Reads default and "on line" parameters.
[Notes]	See $1B $47.
[Default]	Set up from front keys.
[Reference]	$1B $47
[Example]	

aH aL $1B $72

[Name]	**Read EEPROM position.**
[Format]	ASCII aH aL ESC r
	Hex aH aL 1B 72
	Decimal aH aL 27 114
[Range]	$0 \le a \le 63$
	'0' $\le$ aH $\le$ '9', 'A' $\le$ aH $\le$ 'F'
	'0' $\le$ aL $\le$ '9', 'A' $\le$ aL $\le$ 'F'
[Description]	Reads the location addressed by a where:
	aH is the most significant nibble, expressed in ASCII, of a.
	aL is the least significant nibble, expressed in ASCII, of a.
[Notes]	
[Default]	
[Reference]	$1B $77
[Example]	To read the position $12, transmit:

$31 $32 $1B $72

The response will be the location value in hexadecimals expressed in two ASCII bytes.

$1B $74 n

[Name]	**Select character code table.**
[Format]	ASCII ESC t n
	Hex 1B 74 n
	Decimal 2 116 n
[Range]	n = 0, 19, 255
[Description]	Selects a page n from the character code table, as follows:

n	PAGE
0	0 (PC437 [U.S.A., Standard Europe])
19	19 (PC858 for Euro symbol at position 213
255	Page space

[Note]	
[Default]	n = 0
[Reference]	See character code table.
[Example]	For printing Euro symbol (€), the command sequence is: $1B, $74, $13, $D5

aH aL dH dL $1B $77

[Name]	**Write EEPROM position.**						
[Format]	ASCII	aH	aL	dH	dL	ESC	w
	Hex	aH	aL	dH	dL	1B	77
	Decimal	aH	aL	dH	dL	27	119

[Range]   0 ≤ a ≤ 63
'0' ≤ aH ≤ '9', 'A' ≤ aH ≤ 'F'
'0' ≤ aL ≤ '9', 'A' ≤ aL ≤ 'F'
0 ≤ d ≤ 255
'0' ≤ dH ≤ '9', 'A' ≤ dH ≤ 'F'
'0' ≤ dL ≤ '9', 'A' ≤ dL ≤ 'F'

[Description] Writes, at the location addressed by a, data where:
aH is the most significant nibble, expressed in ASCII, of a.
aL is the least significant nibble, expressed in ASCII, of a.
dH is the most significant nibble, expressed in ASCII, of d.
dL is the least significant nibble, expressed in ASCII, of d.

[Notes]
[Default]
[Reference] $1B $72
[Example]   To write the value $34 in position $12, transmit:
$31 $32 $33 $34 $1B $77

$1B $FA n xH xL yH yL

[Name]	**Print graphic bank (608 * 862 dots).**						
[Format]	ASCII	ESC	{ }	n	xH	xL	yH yL
	Hex	1B	FA	n	xH	xL	yH yL
	Decimal	27	250	n	xH	xL	yH yL

[Range]   1 ≤ n ≤ 2
0 ≤ xH, xL, yH, yL ≤ 255

[Description] Prints the graphics bank from flash or ram. n selects the bank as follows:

n	FUNCTION
1	Print flash bank logo 1
2	Print flash bank logo

xL + xH * 256 specifies the starting dot line (1 ÷ 862).
yL + yH * 256 specifies the number of lines to print.

[Notes]   • If (xL + (xH * 256)) > 862 the printer does not execute the command.
• Se (xL + (xH * 256) + yL +(yH * 256))> 862 the printer only prints 862 - xL + (xH * 256) +1 dotlines.

[Default]
[Reference]
[Example]   To print logo 1 from flash bank dotline 100 to dotline 299, send:
$1B $FA $01 $00 $64 $00 $C7

$1B $FF m nL nH d0...dn

[Name]	**Receive and store logos in flash.**							
[Format]	ASCII	ESC	{ }	m	nL	nH	d0	dn
	Hex	1B	FF	m	nL	nH	d0	dn
	Decimal	27	255	m	nL	nH	d0	dn

[Range]   0 ≤ nL, nH ≤ 255
1 ≤ m ≤ 2
0 ≤ d0, dn ≤ 255

[Description]   • Received [nL + (nH * 256)] x 2 bytes and store in the flash.
• If [nL + (nH * 256)] exceeds 32756, the data following will be processed as normal data.
• Saved the graphics bank from flash. m selects the bank as follows:

n	FUNCTION
1	Print flash bank logo 1
2	Print flash bank logo 2

• d0, dn = value of bit stream image.

[Default]
[Reference]
[Example]   To store the logotype indicated below ,into flash bank 2, necessity execute the follows operation.
1) Define the image dimensions.
The width of image is 608 horizontal pixel ; the height maximun of image is 862 vertical pixel.
2) Calculate the number of bytes to send as (height pix*width pix)/16.
Bytes number in example is 608 x 862/16=32756 in exadecimal resulting = 7FF4.
3) Bit stream image conversion.
In the following figure is reproduced the logotype enlargement in the zone indicated by the arrow to define d0...dn

In this example; d0=FF; d1=03; d2=FC; d3=0F

Then send this command to the printer

0x1B	0xFF	0x02	0xF8	0x7F	0xFF	0 x 03	0xFC	0x0F...
		No. logo	Dimension					

$1C $C0 $AA $0F $EE $0B $34

[Name]	**Total cut and automatic paper moving back.**						
[Format]	ASCII	FS	{ }	{ }	SI	{ }	VT	4
	Hex	1C	C0	AA	0F	EE	0B	34
	Decimal	28	192	170	15	254	11	52

[Description] This command enables cutter operation and executes a total cut and automatic paper moving back; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.

[Notes] • The printer waits until all the paper movement commands have been completed before executing total cut.

[Default]
[Reference]
[Example]

$1D $0C

[Name]	**Print the buffer contents.**	
[Format]	ASCII	GS	FF
	Hex	1D	0C
	Decimal	29	12

[Description] Prints contents of buffer characters and executes a line feed.
Sets the printing start position at left margin.

[Notes]
[Default]
[Reference] $0A
[Example]

$1D $3A

[Name]	**Start / end macro definition.**	
[Format]	ASCII	GS	:
	Hex	1D	3A
	Decimal	29	58

[Description] Starts or ends macro definition.

[Notes] • Macro definition starts when this command is received during normal operation.
• When the command $1D $5E is received during macro definition, the printer ends the macro definitions and clears all definitions.
• Macro not defined when the power is turned on.
• The defined contents of the macro are not cleared by the command $1B $40. Therefore, $1B $40 can be included in the contents of the macro definitions.
• If the printer receives the command $1D $3A again immediately after previously receiving $1D $3A, the printer remains in the macro undefined state.
• The contents of the macro can be defined up to 1024 bytes. If the macro definition exceeds 1024 bytes, the excess data is not not stored.

[Default]
[Reference] $1D $5E
[Example]

$1D $43 $30 n m

[Name]	**Set counter print mode.**				
[Format]	ASCII	GS	C	0	n	m
	Hex	1D	43	30	n	m
	Decimal	29	67	48	n	m

[Range] $0 \leq n \leq 5$
m = 0, 1, 2, 48, 49, 50

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[Description]   Selects a print mode for the serial number counter.
                   • n specifies the number of digits to be printed as follows:
                   when n = 0, the printer prints the actual digits indicated by the number value.
                   when n = from 1 to 5, this command sets the number of digits to be printed.
                   • m specifies the printing position within the entire range of printed digits, as follows:

m	PRINTING POSITION	PROCESSING OF DIGITS LOWER THAN THOSE SPECIFIED
0. 48	Right justification	Add spaces to left.
1. 49	Right justification	Add '0' to left.
2. 50	Left justification	Add spaces to right

[Notes]   • if n or m is outside the defined range, the previously set print mode is not changed.
                   • If n = 0, m has no meaning.
[Default]   n = 0, m = 0
[Reference] $1D $43 $31, $1D $43 $32, $1D $43 $3B, $1D $63
[Example]   n = 3,m = 0   n = 3, m = 1   n = 3, m=2
                   □ □ 1   001   1 □ □

                   □ indicates a space

$1D $43 $31 aL aH bL bH n r

[Name]   **Select count mode (A).**
[Format]   ASCII   GS   C   1   aL   aH   bL   bH   n   r
                   Hex   1D   43   31   aL   aH   bL   bH   n   r
                   Decimal   29   67   49   aL   aH   bL   bH   n   r
[Range]   0 ≤ aL, aH ≤ 255
                   0 ≤ bL, bH ≤ 255
                   0 ≤ n, r ≤ 255
[Description]   Selects a count mode for the serial number counter.
                   • aL, aH o bL, bH specify the counter range.
                   • n specify the stepping amount when counting up or down.
                   • r indicates the repetition number when the counter value is fixed.
[Notes]   • Count-up mode is specified when:
                   $[aL + (aH * 256)] < [bL + (bH * 256)]$ and n ≠ 0 and r ≠ 0
                   • Count-down mode is specified when:
                   $[aL + (aH * 256)] > [bL + (bH * 256)]$ and n ≠ 0 and r ≠ 0
                   • Counting stops when:
                   $[aL + (aH * 256)] = [bL + (bH * 256)]$ or n = 0 or r = 0
                   • In setting count-up mode, the minimum value of the counter is $[aL + (aH * 256)]$ and
                   the maximum value is $[bL + (bH * 256)]$. If counting up reaches a value exceeding the
                   maximum, it is resumed with the minimum value.
                   • In setting count-down mode, the maximum value of the counter is $[aL + (aH * 256)]$
                   and the minimum value is $[bL + (bH * 256)]$. If counting down reaches a value less than
                   minimum, it is resumed with the maximum value.
                   • When the command is executed, the internal count that indicates the repetition number
                   specified by r is cleared.
[Default]   aL = 1, aH = 0, bL = 255, bH = 255, n = 1, r = 1
[Reference] $1D $43 $30, $1D $43 $32, $1D $43 $3B, $1D $63
[Example]

$1D $43 $32 nL nH

[Name]	**Set counter.**				
[Format]	ASCII	GS	C	2	nL	nH
	Hex	1D	43	32	nL	nH
	Decimal	29	67	50	nL	nH

[Range]   0 ≤ nL, nH ≤ 255

[Description] Sets the serial number counter value.

• nL and nH determine the value of the serial number counter set by [nL + (nH * 256)].

[Notes]   • In count-up mode, if the counter value specified by this command goes out of the counter operation range specified by $1D $43 $31 or $1D $43 $3B it is forced to convert to the minimum value by $1D $63.

• In count-down mode, if the counter value specified by this command goes out of the counter operation range specified by $1D $43 $31 or $1D $43 $3B, it is forced to convert to the maximum value by $1D $63.

[Default]   nL = 1, nH = 0

[Reference] $1D $43 $30, $1D $43 $31, $1D $43 $3B, $1D $63

[Example]

$1D $43 $3B sa $3B sb $3B sn $3B sr $3B sc $3B

[Name]	**Select count mode (B).**											
[Format]	ASCII	GS	C	;	sa	;	sb	;	sn	;	sr	;	sc	;
	Hex	1D	43	3B	sa	3B	sb	3B	sn	3B	sr	3B	sc	3B
	Decimale	29	67	59	sa	59	sb	59	sn	59	sr	59	sc	59

[Range]   0 ≤ sa, sb, sc ≤ 65535
0 ≤ sn, sr ≤ 255
These values are all character strings.

[Description] Selects a count mode for the serial number counter and specifies the value of the counter.

• sa, sb, sn, sr and sc are all displayed in ASCII characters using the codes from 'O' to '9'.

• sa and sb specify the counter range.

• sn indicates the stepping amount for counting up or down.

• sr indicates the repetition number with the counter value fixed.

• sc indicates the counter value.

[Notes]   • Count-up mode is specified when:
sa < sb and sn ≠ 0 and sr ≠ 0

• Count-down mode is specified when:
sa > sb and sn ≠ 0 and sr ≠ 0

• Counting stops when:
sa = sb or sn = 0 or sr = 0

• In setting count-up mode, the minimum value of the counter is sa and the maximum is sb. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the minimum value by executing $1D $63.

• In setting count-down mode, the maximum value of the counter is sa and the minimum value is sb. If counting down reaches a value less than the minimum, it is resumed with the maximum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the maximum value by executing $1D $63.

• Parameters sa to sc can be omitted. If omitted, these values remain unchanged.

• Parameters sa to sc must not contain characters, with the exception of those from '0' to '9'.

[Default]   sa = 1, sb = 65535, sn = 1, sr = 1, sc = 1

[Reference] $1D $43 $30, $1D $43 $32, $1D $43 $31, $1D $63

[Example]

$1D $48 n

[Name]	**Select printing position of Human Readable Interpretation (HRI)**
[Format]	ASCII GS H n
	Hex 1D 48 n
	Decimal 29 72 n
[Range]	0 ≤ n ≤ 3, 48 ≤ n ≤ 51
[Description]	Selects the printing position of HRI characters when printing bar code. n selects the printing position as follows:

n	FUNCTION
0, 48	Not printed
1, 49	Above the bar code.
2, 50	Underneath the bar code.
3, 51	Both above and underneath the bar code

[[Notes]	• HRI characters are printed using the font specified by the command $1D $66.
[Default]	n = 0
[Reference]	$1D $66, $1D $6B
[Example]	

$1D $49 n

[Name]	**Transmit printer ID.**
[Format]	ASCII GS I n
	Hex 1D 49 n
	Decimal 29 73 n
[Range]	1 ≤ n ≤ 3, 49 ≤ n ≤ 51
[Description]	Transmits the printer ID specified by n as follows:

n	PRINTER ID	SPECIFICATION
1, 49	Printer mode identification	$93 (TG2480)
2, 50	Function identification	See table below
3, 51	ROM version identification	Depends on ROM version (4 char)

n = 2, 50 Identification Function

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Non supported 2-byte character codes
1	Off	00	0	Autocutter not supplied
	On	02	2	Autocutter supplied
2	Off	00	0	Thermal paper without label
	On	04	4	Thermal paper with label
3	-	-	-	RESERVED
4	Off	00	0	Fixed to Off
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	Off	00	0	Fixed to Off

[Notes]	• When the DTR/DSR control is selected, the printer only transmits 1 byte (Printer identification) after it has been given confirmation that the host is ready to receive data. If the host is not ready, the printer waits until it is.
	• When the XON/XOFF control is selected, the printer only transmits 1 byte (Printer identification) if it has not been given confirmation that the host is ready to receive data.

• This command is carried out once the data has been processed in the reception buffer. There may therefore be a delay between the moment in which the command is received and that in which the data is transmitted, depending on the status of the reception buffer.

[Default]
[Reference]
[Example]

$1D $50 x y

[Name]	**Set horizontal and vertical motion units.**			
[Format]	ASCII	GS	P	x	y
	Hex	1D	50	x	y
	Decimal	29	80	x	y

[Range]   x = 100, 200
             y = 100, 200

[Description] Sets the horizontal and vertical motion units at 1/x inches and 1/y inches, respectively.
             When x is set at 0, the default setting value is used.
             When y is set at 0, the default setting value is used.

[Notes]   • This command set the ESC/POS emulation and initialize the default values again.
             • The horizontal direction is perpendicular to the paper feed direction.
             • This command does not affect the previously specified values.
             • The calculated result from combining this command with others is truncated to the minimum value of the mechanical pitch or an exact multiple of that value.

[Default]   x = 200, y = 200
[Reference] $1B $24
[Example]

$1D $5E r t m

[Name]	**Execute macro.**				
[Format]	ASCII	GS	^	r	t	m
	Hex	1D	5E	r	t	m
	Decimal	29	94	r	t	m

[Range]   0 ≤ r, t ≤ 255
             0 ≤ m ≤ 1

[Description] Executes a macro.
             • rspecifies the number of times to execute the macro.
             • t specifies the waiting time for executing the macro.
             The waiting time is t * 100 msec. for every macro execution.
             • m specifies macro executing mode:
             When the LSB of m = 0, the macro executes r times continuously at the interval specified t.
             When the LSB of m = 1, after waiting for the period specified by t, the LED indicator blinks and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation r times.

[Notes]   • This command lasts for a period of (t * 100 msec.) after a macro is executed by t.
             • If this command is received while a macro is being defined, the macro definition is aborted and the definitions cleared.
             • If the macro is not defined or if r is 0, nothing happens.
             • When the macro is executed by pressing the FEED button (m = 1), the paper can not be fed by using the FEED button.

[Default]
[Reference] $1D $3A
[Example]

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$1D $63

[Name]	**Print counter.**
[Format]	ASCII GS c
	Hex 1D 63
	Decimal 29 99

[Description]   Sets the serial counter value in the print buffer and increments or decrements the counter value.

[Notes]
- After setting the current counter value in the print buffer as print data (a character string), the printer counts up or down based on the count mode set. The counter value in the print buffer is printed when the printer receives a print command or is in the buffer full state.
- The counter print mode is set by $1D $43 $30.
- The counter mode is set by $1D $43 $31 or $1D $43 $3B.
- In count-up mode, if the counter value set by this command goes out of the counter operation range set by $1D $43 $31 or $1D $43 $3B, it is forced to convert to the minimum value.
- In count-down mode, if the counter value set by this command goes out of the counter operation range set by $1D $43 $31 or $1D $43 $3B, it is forced to convert to the maximum value.

[Default]
[Reference] $1D $43 $30, $1D $43 $31, $1D $43 $32, $1D $43 $3B
[Example]

$1D $66 n

[Name]	**Select font for HRI characters.**
[Format]	ASCII GS f n
	Hex 1D 66 n
	Decimal 29 102 n

[Range]   n = 0, 1, 48, 49

[Description]   Selects a font for the HRI characters used when printing a bar code.

n selects a font from the following table:

n	FONT
0, 48	FONT A (14 x 24)
1, 49	FONT B (10 x 24)

[Notes]   The HRI characters are printed at the position specified by the command $1D $48.
[Default]   n = 0
[Reference] $1D $48, $1D $6B
[Example]

$1D $68 n

[Name]	**Set bar code height.**
[Format]	ASCII GS h n
	Hex 1D 68 n
	Decimal 29 104 n

[Range]   1 ≤ n ≤ 255
[Description]   Sets the height of the bar code. n specifies the number of dots in the vertical direction.
[Notes]
[Default]   n = 96 (12 mm)
[Reference] $1D $6B
[Example]

$1D $6B m 00

[Name]	**Print bar code.**
[Format]	① ASCII GS k m NUL
	Hex 1D 6B m 00
	Decimal 29 107 m 0
	② ASCII GS k m n
	Hex 1D 6B m n
	Decimal 29 107 m n
[Range]	① $0 \leq m \leq 6$
,	② $65 \leq m \leq 73$
[Description]	Selects a bar code system and prints the bar code. m selects a bar code sys

	m	BARCODE SYSTEM	No. OF CHARACTERS	REMARKS
①	0	UPC-A	$11 \leq k \leq 12$	$48 \leq d \leq 57$
	1	UPC-E	$11 \leq k \leq 12$	$48 \leq d \leq 57$
	2	EAN13 (JAN)	$12 \leq k \leq 13$	$48 \leq d \leq 57$
	3	EAN8 (JAN)	$7 \leq k \leq 8$	$48 \leq d \leq 57$
	4	CODE39	$1 \leq k$	$48 \leq d \leq 57$, $65 \leq d \leq 90$, 32, 36, 37, 43, 45, 46, 47
	5	ITF	$1 \leq k$ (numero pari)	$48 \leq d \leq 57$
	6	CODABAR	$1 \leq k$	$48 \leq d \leq 57$, $65 \leq d1 \leq 68$, 36, 43, 45, 46, 47, 58
	7	CODE93	$1 \leq k \leq 255$	$1 \leq d \leq 127$
	8	CODE128	$2 \leq k \leq 255$	$1 \leq d \leq 127$
	20	CODE32	$8 \leq k \leq 9$	$48 \leq d \leq 57$

	m	BARCODE SYSTEM	No. OF CHARACTERS	REMARKS
②	65	UPC-A	$11 \leq n \leq 12$	$48 \leq d \leq 57$
	66	UPC-E	$11 \leq n \leq 12$	$48 \leq d \leq 57$
	67	EAN13 (JAN)	$12 \leq n \leq 13$	$48 \leq d \leq 57$
	68	EAN8 (JAN)	$7 \leq n \leq 8$	$48 \leq d \leq 57$
	69	CODE39	$1 \leq n \leq 255$	$48 \leq d \leq 57$, $65 \leq d \leq 90$, 32, 36, 37, 43, 45, 46, 47
	70	ITF	$1 \leq n \leq 255$	$48 \leq d \leq 57$
	71	CODABAR	$1 \leq n \leq 255$	$48 \leq d \leq 57$, $65 \leq d1 \leq 68$, 36, 43, 45, 46, 47, 58
	72	CODE93	$1 \leq n \leq 255$	$1 \leq d \leq 127$
	73	CODE128	$2 \leq n \leq 255$	$1 \leq d \leq 127$
	90	CODE32	$8 \leq n \leq 9$	$48 \leq d \leq 57$

[Notes]	• If d is outside the specified range, the printer prints the following message: "BAR CODE GENERATOR NON OK !" and processes the following data as normal data.
	• If the horizontal size exceeds the printing area, the printer only feeds the paper.
	• This command feeds as much paper as is required to print the bar code.
	• After printing the bar code, this command sets the print position at the beginning of the line.
	• This command is not affected by print modes (bold, double strike, underline or character size), with the exception of upside-down mode and justification.
[Notes for ①]	• This command ends with a $00 code.
	• When the bar code used is UPC-A or UPC-E, the printer prints the bar code data after receiving 11 (without check digit) or 12 (with check digit) byte bar code data.
	• When the bar code system used is EAN13, the printer prints the bar code after receiving 12 (without check digit) or 13 (with check digit) byte bar code data.
	• When the system used is EAN8, the printer prints the bar code after receiving 7 (without check digit) or 8 (with check digit) byte bar code data.

[Note for ②]

• The number of data for ITF bar code must be even. When an odd number of data is input, the printer ignores the last received data.
• If n is outside the specified range, the printer stops command processing and process the following data as normal data.

When to use
CODE93:

• The printer prints an HRI character (o) as a start character at the beginning of the HRI character string.
• The printer prints an HRI character (o) as a stop character at the end of the HRI character string.
• The printer prints an HRI character (n) as a control character ($00 to $1F and $7F).

When to use
CODE128:

• When using the CODE128 in this printer, take the following points into account for data transmission:
• The top of the bar code data string must be a code set selection character (CODE A , CODE B or CODE C) which selects the first code set.
• Special characters are defined by combining two characters "{" and one character. The ASCII character "}" is defined by transmitting "{" twice consecutively.

SPECIFIC CHARACTER	DATA TRANSMISSION		
	ASCII	HEX	DECIMAL
SHIFT	{S	7B, 53	123, 83
CODE A	{A	7B, 41	123, 65
CODE B	{B	7B, 42	123, 66
CODE C	{C	7B, 43	123, 67
FNC1	{1	7B, 31	123, 49
FNC2	{2	7B, 32	123, 50
FNC3	{3	7B, 33	123, 51
FNC4	{4	7B, 34	123, 52
'{'	{{	7B, 7B	123, 123

[Default]
[Reference] $1D $48, $1D $66, $1D $68, $1D $77
[Example]

$1D $77 n

[Name]	**Set bar code width.**		
[Format]	ASCII	GS	w	n
	Hex	1D	77	n
	Decimal	29	119	n
[Range]	2 ≤ n ≤ 6		
[Description]	Sets the horizontal size of the bar code. n specifies the bar code width as follows:		

n	MODULE WIDTH (MM)
2	0.25
3	0.375
4	0.5
5	0.625
6	0.7

[Notes]
[Default]   n = 3
[Reference] $1D $6B
[Example]

$1D $7C n

[Name]	**Set printing density.**		
[Format]	ASCII	GS	{ }	n
	Hex	1D	7C	n
	Decimal	29	124	n
[Range]	0 ≤ n ≤ 4, 48 ≤ n ≤ 52		
[Description]	Sets the printing density. n specifies the printing density as follows:		

n	PRINTING DENSITY
0, 48	Very light
1, 49	Light
2, 50	Normal
3, 51	Dark
4, 52	Very dark

[Notes]   • The printing density is cleared at default value when the printer is reset or the power is turned off.
[Default]   n = 2
[Reference]
[Example]

3.2.3 CBM iDP560RS Emulation

The following table lists all the commands for function management in CBM iDP560RS Emulation. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously sent have been executed. There are no priority commands; all commands are carried out when the circular buffer is free to do.

COMMAND TABLE   (Tab.3.3)

HEX Com.	ASCII Com.	Description
$00	NUL	Printing with small characters
$01	SOH	Printing with double width characters
$02	STX	Printing with double height characters
$03	ETX	Printing with expanded characters
$04	EOT	Printing with small characters
$0A	LF	Print and line feed
$0C	FF	Carries out form feed after printing
$0D	CR	Print and carriage return
$0E	SO	Improved character designation (same as $1E)
$0F	SI	Standard character designation (same as $1F)
$11	DC1	Places the printer ON LINE
$13	DC3	Places the printer OFF LINE
$14	DC4	Set / erase reverse printing mode.
$18	CAN	Cancel print data buffer
$1E	RS	Enhanced character designation
$1F	US	Standard character designation
$1B $31	ESC 1	Set 3 mm line spacing
$1B $32	ESC 2	Set 5.5 mm line spacing
$1B $40	ESC @	Initialize the printer
$1B $43 n	ESC C n	Page length designation and page formatting
$1B $4B n1 n2	ESC K n1 n2	Graphic mode printing
$1B $4F	ESC O	Page formatting off
$1B $52 n	ESC R n	Select the international character set.
$1B $69	ESC i	Total cut
$1B $FA n xH xL yH yL	ESC · n xH xL yH yL	Print graphic bank
$1C $C0 $AA $0F $EE $0B $34	FS { } { } SI { } VT 4	Total cut and automatic paper moving back
$1D $49 n	GS I n	Transmit printer ID
$1D $50 x y	GS P x y	Set horizontal and vertical motion unit
$1D $7C n	GS { } n	Set printing density

The following pages provide a more detailed description of each command.

$00

[Name]	**Print with small characters.**	
[Format]	ASCII	NUL
	Hex	00
	Decimal	0
[Description]	Character printing is executed in small format (normal).	
[Notes]	• Setting remains until next set.	

[Default]	Set up from front keys.
[Reference]	$1E, $1F, $0F, $0E, $01, $02, $03, $04
[Example]	

$01

[Name]	**Printing with double width characters.**
[Format]	ASCII SOH
	Hex 01
	Decimal 1
[Description]	Printing of the character is executed in double width format
[Notes]	• Setting remains until next set.
[Default]	Set up from front keys.
[Reference]	$00, $02, $03, $04
[Example]	

$02

[Name]	**Printing in double height characters.**
[Format]	ASCII STX
	Hex 02
	Decimal 2
[Description]	Printing of the character is executed in double height format.
[Notes]	• Setting remains until next set.
[Default]	Set up from front keys.
[Reference]	$00, $01, $03, $04, $0E, $0F, $1E, $1F
[Example]	

$03

[[Name]	**Printing with expanded characters.**
[Format]	ASCII EXT
	Hex 03
	Decimal 3
[Description]	Printing of the character is executed in expanded format.
[Notes]	• Setting remains until next set.
[Default]	Set up from front keys.
[Reference]	$00, $01, $02, $04, $0E, $0F, $1E, $1F
[Example]	

$04

[Name]	**Printing with small characters.**
[Format]	ASCII EOT
	Hex 04
	Decimal 4
[Description]	Character printing is executed in small format (normal).
[Notes]	• Setting remains until next set.
[Default]	Set up from front keys.
[Reference]	$00, $01, $02, $03, $0E, $0F, $1E, $1F
[Example]	

$0A

[Name]	**Print and line feed.**
[Format]	ASCII LF
	Hex 0A
	Decimal 10

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[Description]	Prints the data in the buffer and feeds one line, based on the current line spacing.
[Notes]	This command sets the print position at the beginning of the line.
[Default]	
[Reference]	$1B $31, $1B $32
[Example]	

$0C

[Name]	**Carries out form feed after printing.**	
[Format]	ASCII	FF
	Hex	0C
	Decimal	10
[Description]	Prints the data in the buffer and feeds in accordance with the page length specified by the command $1B $43.	
[Notes]	This command sets the print position at the beginning of the line.	
[Default]		
[Reference]	$1B $43	
[Example]		

$0D

[Name]	**Print and carriage return.**	
[Format]	ASCII	CR
	Hex	0D
	Decimal	13
[Description]	When autofeed is "$0D enabled", this command functions in the same way as $0A, otherwise, it is ignored.	
[Notes]	This command sets the print position at the beginning of the line.	
[Default]	See the "autofeed" parameter from Setup.	
[Reference]	$0A	
[Example]		

$0E

[Name]	**Improved character designation (same as $1E).**	
[Format]	ASCII	SO
	Hex	0E
	Decimal	14
[Description]	Printing of the character is executed in expanded format.	
[Notes]	• The command $0E is automatically launched after printing.	
	• Same as $1E	
[Default]	Set up from front keys.	
[Reference]	$01, $02, $03, $04, $0F, $1E, $1F	
[Example]		

$0F

[Name]	**Standard character designation (same as $1F).**	
[Format]	ASCII	SI
	Hex	0F
	Decimal	15
[Description]	Printing of the character is executed in small format (normal).	
[Notes]	• Same as $1F	
[Default]	Set up from front keys.	
[Reference]	$01, $02, $03, $04, $0E, $1E, $1F	
[Example]		

$11

[Name]	**Places the printer ON LINE.**	
[Format]	ASCII	DC1
	Hex	11
	Decimal	17
[Description]	Places the printer ON LINE.	
[Notes]	• Only this code can be accepted independently of the status OFF LINE.	
[Default]		
[Reference]	$13	
[Example]		

$13

[Name]	**Places the printer OFF LINE.**	
[Format]	ASCII	DC3
	Hex	13
	Decimal	19
[Description]	Places the printer OFF LINE.	
[Notes]		
[Default]		
[Reference]	$11	
[Example]		

$14

[Name]	**Set / erase reverse printing mode.**	
[Format]	ASCII	DC4
	Hex	14
	Decimal	20
[Description]	Sets / erases (alternately) reverse printing mode.	
[Notes]		
[Default]		
[Reference]		
[Example]		

$18

[Name]	**Cancel print data buffer.**	
[Format]	ASCII	CAN
	Hex	18
	Decimal	24
[Description]	Deletes all the print data in the current print buffer.	
[Notes]	This command sets the print position at the beginning of the line.	
[Default]		
[Reference]		
[Example]		

$1E

[Name]	**Enhanced character designation.**	
[Format]	ASCII	RS
	Hex	1E
	Decimal	30
[Description]	Printing of the character is executed in expanded format.	
[Notes]	• The command RS is automatically launched after printing.	
[Default]	Set up from front keys.	

[Reference] $01, $02, $03, $04, $0E, $0F, $1F
[Example]

$1F

[Name]   **Standard character designation.**
[Format]   ASCII   US
                Hex   1F
                Decimal   31
 [Description]   Printing of the character is executed in small format (normal).
[Notes]
[Default]   Set up from front keys.
[Reference] $01, $02, $03, $04, $0E, $0F, $1E
[Example]

$1B $31

[Name]   **Set 3 mm. line spacing.**
[Format]   ASCII   ESC   1
                Hex   1B   31
                Decimal   27   49
[Description]   Sets 3 mm line spacing.
[Notes]
[Default]
[Reference] $1B $32
[Example]

$1B $32

[Name]   **Set 5.5 mm line spacing.**
[Format]   ASCII   ESC   2
                Hex   1B   32
                Decimal   27   50
[Description]   Set 5.5 mm line spacing.
[Notes]
[Default]
[Reference] $1B $31
[Example]

$1B $40

[Name]   **Inizialize the printer.**
[Format]   ASCII   ESC   @
                Hex   1B   40
                Decimal   27   64
[Description]   Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.
[Notes]   • Same as hardware reset.
[Default]
[Reference]
[Example]

$1B $43 n

[Name]   **Page length designation and page formatting.**
[Format]   ASCII   ESC   C   n
                Hex   1B   43   n
                Decimal   27   67   n

[Range]	14 ≤ n ≤ 120
[Description]	This command sets the length (number of lines) of the page, and paging formatting begins. A space of three lines is left at both the top and bottom of the page.
[Notes]	• Page formatting can be cleared through the command $1B $4F.
[Default]	n = 66
[Reference]	$0C, $1B $4F
[Example]	

$1B $4B n1 n2

[Name]	**Graphic mode printing.**			
[Format]	ASCII	ESC	K	n1	n2
	Hex	1B	4B	n1	n2
	Decimal	27	75	n1	n2
[Range]	1 ≤ n1 ≤ 240; n2 = mute data			
[Description]	This command prints n1 bytes of data in graphic mode. The data bytes are arranged vertically starting from the left margin, but only the first seven LSBs are significant.			
[Notes]	After the last data byte, the printer prints, forward feeds the paper (by 21 dots per line) and graphic mode printing is cleared.			
[Reference]				
[Example]				

$1B $4F

[Name]	**Page formatting off.**	
[Format]	ASCII	ESC	O
	Hex	1B	4F
	Decimal	27	79
Description]	Cancel page formatting mode.	
[Notes]		
[Default]		
[Reference]	$1B $43	
[Example]		

$1B $52 n

[Name]	**Select the international character set.**	
[Format]	ASCII	ESC	R	n
	Hex	1B	52	n
	Decimal	27	82	n
[Range]	0 ≤ n ≤ 12	
[Description]	Selects the international character set by setting n as in the following table:	

	HEX	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
n	CHARACTERS SET												
0	U.S.A.	#	$	@	[	\	]	^	`	{	|	}	~
1	France	#	$	à	°	ç	§	^	`	é	ù	è	"
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	b
3	United Kingdom	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark I	#	$	@	Æ	Æ	Å	^	`	æ	f	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain I	Pt	$	@	i	Ñ	¿	^	`	"	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#	¤	É	Æ	Æ	Å	Ü	é	æ	f	å	ü
10	Denmark II	#	$	É	Æ	Æ	Å	Ü	é	æ	f	å	ü

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[Default]   n = 0
[Reference]
[Example]

$1B $69

[Name]	**Total cut.**		
[Format]	ASCII	ESC	i
	Hex	1B	69
	Decimal	27	105
[Description]	This command enables cutter operation; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.		
[Notes]	• The printer waits until all the paper movement commands have been completed before executing total cut.		

[Default]
[Reference]
[Example]

$1B $FA n xH xL yH yL

[Name]	**Print graphic bank (608 x 862 dots).**						
[Format]	ASCII	ESC	{ }	n	xH	xL	yH yL
	Hex	1B	FA	n	xH	xL	yH yL
	Decimal	27	250	n	xH	xL	yH yL

[Range] $1 \le n \le 2$
                   $0 \le xH, xL, yH, yL \le 255$

[Description]   Prints the graphics bank from flash. n selects the bank as follows:

n	FUNCTION
1	Print flash bank logo 1
2	Print flash bank logo 2

xL + xH * 256 specifies the starting dot line (1 ÷ 862).
yL + yH * 256 specifies the number of lines to print.

[Notes]   • If (xL + (xH * 256)) > 862 the printer does not execute the command.
                   • Se (xL + (xH * 256) + yL +(yH * 256))> 862 the printer only prints 862 - xL + (xH * 256) +1 dotlines.

[Default]
[Reference]
[Example]   To print logo1 from flash bank dotline 100 to dotline 299, send:
                   $1B $FA $01 $00 $64 $00 $C7

$1C $C0 $AA $0F $EE $0B $34

[Name]	**Total cut and automatic paper moving back.**						
[Format]	ASCII	FS	{ }	{ }	SI	{ }	VT 4
	Hex	1C	C0	AA	0F	EE	0B 34
	Decimal	28	192	170	15	254	11 52
[Description]	This command enables cutter operation and executes a total cut and automatic paper moving back; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.						
[Notes]	• The printer waits until all the paper movement commands have been completed before executing total cut.						

[Default]
[Reference]
[Example]

$1D $49 n

[Name]	**Transmit printer ID.**		
[Format]	ASCII	GS I	n
	Hex	1D 49	n
	Decimal	29 73	n
[Range]	1 ≤ n ≤ 3, 49 ≤ n ≤ 51		
[Description]	Transmits the printer ID specified by n as follows:		

n	PRINTER ID	SPECIFICATION
1, 49	Printer mode identification	$93 (TG2480)
2, 50	Function identification	See table below
3, 51	ROM version identification	Depends on ROM version (4 char)

n = 2, 50 Identification Function

BIT	OFF/ON	HEX	Decimal	FUNCTION
0	Off	00	0	Non supported 2-byte character codes
1	Off	00	0	Auto-cutter not supplied
	On	02	2	Auto-cutter supplied
2	Off	00	0	Thermal paper without label
	On	04	4	Thermal paper with label
3	-	-	-	RESERVED
4	Off	00	0	Fixed to Off
5	-	-	-	RESERVED
6	-	-	-	RESERVED
7	Off	00	0	Fixed to Off

[Notes]	• This command is executed when the data is processed in the reception buffer. There may therefore be a time lag between receiving the command and transmitting the data, depending on the status of the reception buffer.
[Default]	
[Reference]	
[Example]	

$1D $50 x y

[Name]	**Set horizontal and vertical motion units.**			
[Format]	ASCII	GS P	x	y
	Hex	1D 50	x	y
	Decimal	29 80	x	y
[Range]	x = 100, 200			
	y = 100, 200			
[Description]	Sets the horizontal and vertical motion units at 1/x inches and 1/y inches, respectively. When x is set at 0, the default setting value is used. When y is set at 0, the default setting value is used.			
[Notes]	Set the ESC/POS emulation with default values. • The horizontal direction is perpendicular to the paper feed direction. • This command does not affect the previously specified values. • The calculated result from combining this command with others is truncated to the minimum value of the mechanical pitch or an exact multiple of that value.			
[Default]	x = 200, y = 200			
[Reference]				
[Example]				

$1D $7C n

[Name]	**Set printing density.**
[Format]	ASCII GS { } n
	Hex 1D 7C n
	Decimal 29 124 n
[Range]	$0 \leq n \leq 4$, $48 \leq n \leq 52$
[Description]	Sets the printing density. n specifies the printing density as follows:

n	PRINTING DENSITY
0, 48	Very light
1, 49	Light
2, 50	Normal
3, 51	Dark
4, 52	Very dark

[Notes]	• The printing density is cleared at default value when the printer is reset or the power is turned off.
[Default]	n = 2
[Reference]	
[Example]	

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4.1 TECHNICAL SPECIFICATIONS

Table 4.1 gives the main technical specifications for the printer.

(Tab.4.1)

Available interfaces	Serial RS232	USB
Baud rate	From 1200 to 115200 bps	-
Sensors	Head temperature, paper presence, paper jam, ticket withdrawal OPTIONAL: Near paper end (external)	
Printing driver	Window™ 2K, XP	
Receive buffer	1 Kbytes	
Flash memory	384 Kbytes	
Emulation	ESC/POS, CUSTOM, iDP560RS	
PRINTER SPECIFICATIONS		
Print method	Thermal, fixed head	
Resolution	203 DPI (8 dot/mm)	
Printing mode	Straight, 180°	
Printing format	Normal, height / width from 1 to 4, bold, reverse, underlined, italic	
Character fonts	ASCII standard, International	
Graphics memory	1 Logo (608 x 862 dots)	
PAPER SPECIFICATIONS		
Type of paper	Thermal rolls (heat-sensitive side on outside of roll)	
Paper width	80 mm ±0.5 mm	
External roll diameter	Max 80 mm	
Recommended types of paper	55 g/m^2 – 100 g/m^2 *(KANZAN KF50 o KP460, MITSUBISCHI PG5075 o TL4000)*	
Paper thickness	0,110 ÷ 0,061 mm	
Internal roll core diameter	25 mm (not attached to roll core)	
Core type	Cardboard or plastic	
ELECTRICAL SPECIFICATIONS		
Power Supply	24 Vdc ± 10%	
Absorptions		
Medium (50% Dot ON)	1.8 A	
Stand by	0.1 A	
ENVIRONMENTAL CONDITIONS		
Operating temperature	0-50°C	
Relative humidity	10-85% Rh	
Storage temperature / Humidity	-20 °C – 70 °C / 10% - 90% Rh	
Dimensions	Length [mm] =	250
	Width [mm] =	130
	Height [mm] =	110
Weight [gr]	1130 (without paper roll)	

ESC/POS EMULATION			
Number of columns	43	60	76
Printing speed			
Lines / sec.	30	30	30
Chars / sec.	1290	1800	2280
Characters (L x H mm)			
Normal	1.7 x 3	1.2 x 3	1 x 3
Char set	3		

CUSTOM EMULATION 24/42		
Number of columns	33	60
Printing speed		
Lines / sec.	21.6	21.6
Chars / sec.	712	1296
Characters (L x H mm)		
Normal	2 x 3	2 x 3
Char set	4	

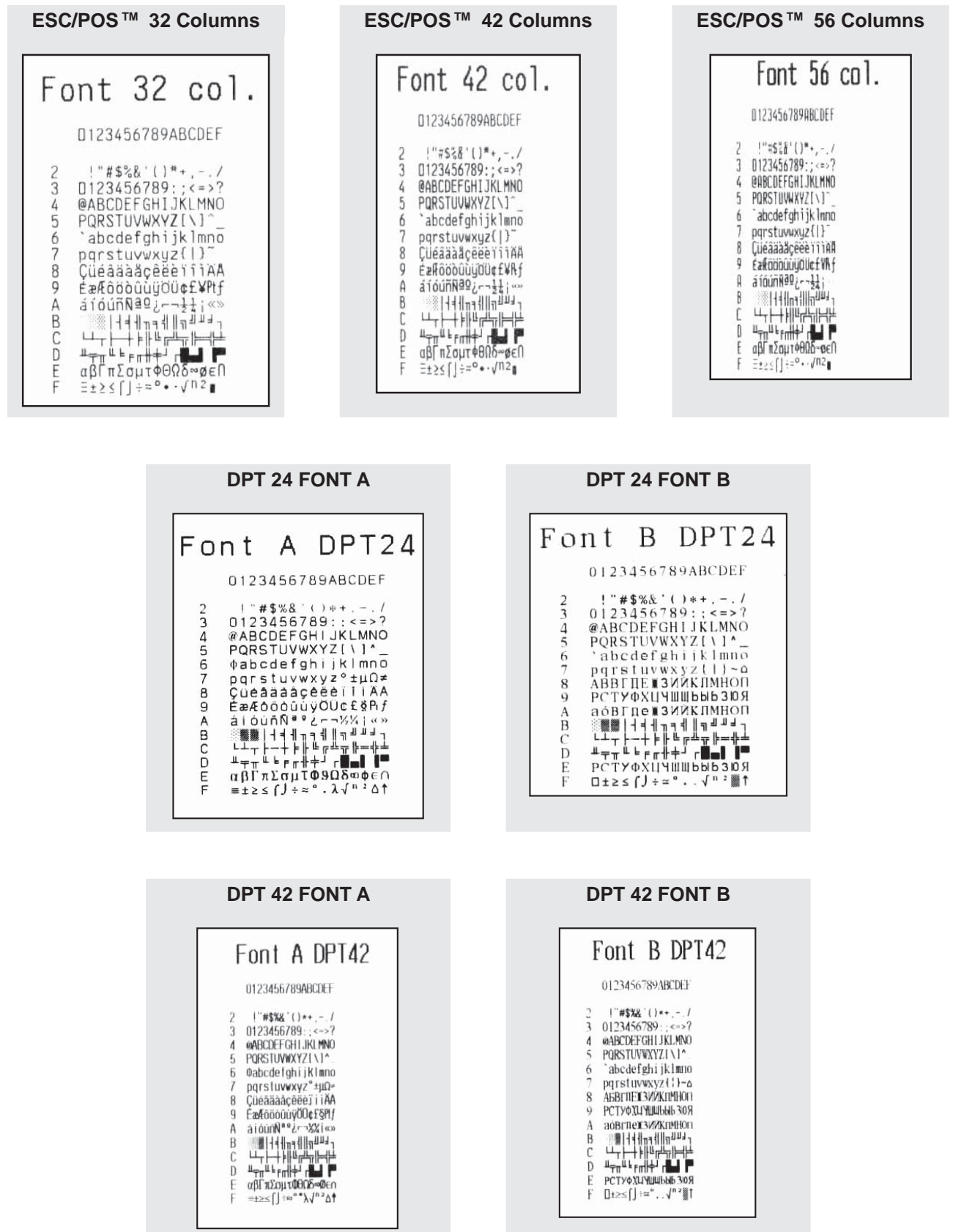| CBM iDP560 RS (Citizen) EMULATION		
Number of columns	33	55
Printing speed		
Lines / sec.	21.6	21.6
Chars / sec.	712	1188
Characters (L x H mm)		
Normal	2 x 3	2 x 3
Char set	2	

4.2 DIMENSIONS

(Fig.4.1)

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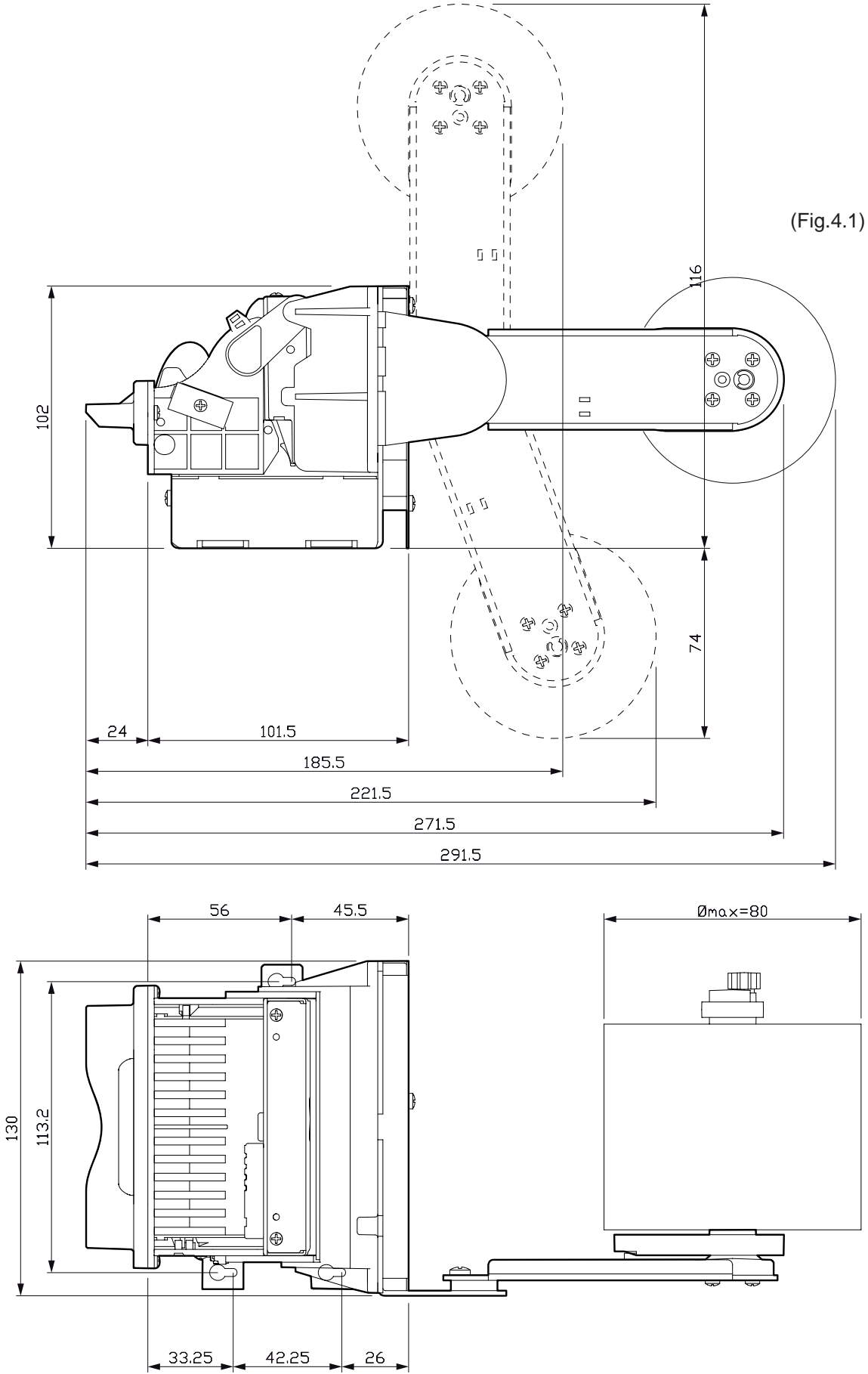
5.1 CHARACTER SET

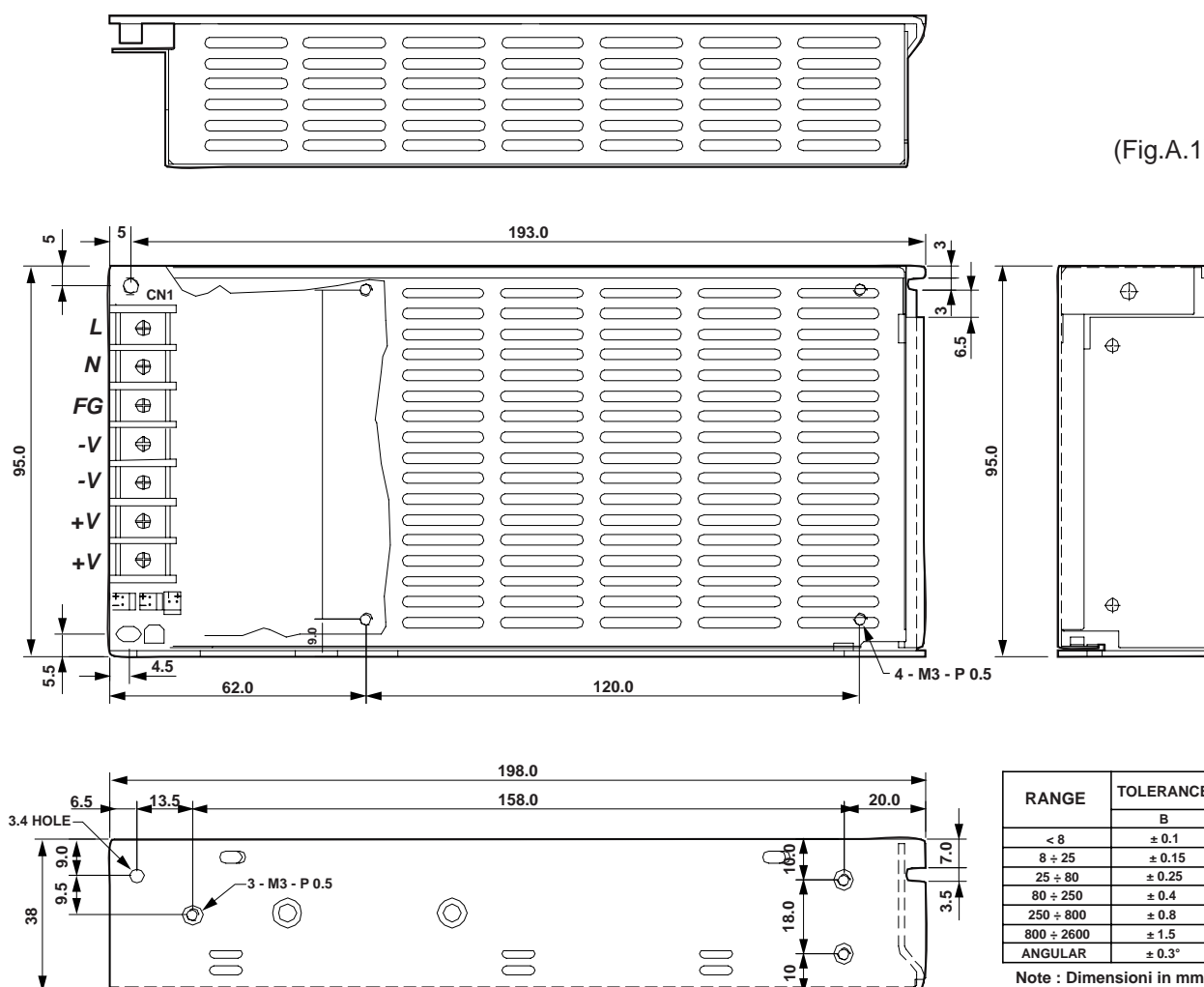The printer has seven sets of 224 character each one. In the following figures are shown the examples

ESC/POS™ 32 Columns	ESC/POS™ 42 Columns	ESC/POS™ 56 Columns

DPT 24 FONT A	DPT 24 FONT B

DPT 42 FONT A	DPT 42 FONT B

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A.1 ACCESSORIES

A.1.1 Power supply

The figure below illustrates the power supply to be used for printer operation:

(Fig.A.1)

RANGE	TOLERANCE
	B
< 8	± 0.1
8 ÷ 25	± 0.15
25 ÷ 80	± 0.25
80 ÷ 250	± 0.4
250 ÷ 800	± 0.8
800 ÷ 2600	± 1.5
ANGULAR	± 0.3°

Note : Dimensioni in mm

PPSPS-100-24	Switching power supply 24V 100W
Input specifications	
Input voltage	85 ÷ 264 V
Current	0 ÷ 4.5 A
Input frequency	47 ÷ 63 Hz
Output specifications	
Output voltage	24 V
Output current min.-max.	0 ÷ 4.5 A
Efficiency min.	80%
Environmental conditions	
Operating temperature	0 ÷ 70 °C
Humidity	20 ÷ 85 % Rh (w/o condensation)
Storage temperature / Humidity	-10 ÷ 85 °C / 10 ÷ 95 % Rh (w/o condensation)
Protection devices:	Short-circuit, overload

A.2 SPARE PARTS

A.2.1 Supplies
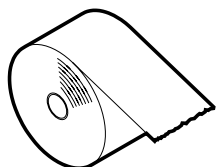
RCT80X48-25MM				
Thermal paper roll 80 mm d=48 core 25 mm				
Quantity recommended per no. machines purchased				
No. machines	*<10*	*<50*	*<100*	*>100*
Quantities recommended	*5*	*30*	*60*	*90*

CUSTOM

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