

MTP-1530II Modular Thermal Printer User Manual



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Telpar — Printer Limited Warranty

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Table of Contents

1	General	6
1.1	Definitions	7
1.1.1	Standard Mode versus Page Mode	7
1.1.2	Hex Dump Mode	7
1.1.3	Explanation of Terms used throughout this manual	9
1.2	Applications	9
1.3	Standard Features	10
1.4	Specifications	11
1.5	Power Supply Requirements	11
1.5.1	Voltage: 24 VDC \pm 10%	11
1.5.2	Power Supply Option from Telpar	11
1.5.3	3-Pin Hosiden Connector on Printer for Power Supply Connection	12
1.6	Telpar Roll Paper for MTP-1530II Series	12
1.7	Sensor Locations and Functions	13
2	Operator Instructions	15
2.1	Unpacking and Inspection	15
2.2	Paper Loading	15
2.2.1	Side-Loading Roll.....	15
2.2.2	Black Mark Sensors Load.....	15
2.3	Paper Jam	17
2.3.1	Head Open Lever.....	17
3	Installation	18
3.1	Self Test Mode	18
4	Setup and Control of the Printer	20
4.1	DIP Switch Settings and Memory Switch Settings	20
4.2	LEDs and Error Indication	26
4.3	Control Codes and Control Sequences List	28
4.4	Control Codes and Control Sequences Definition	31
4.4.1	General Usage Print Commands.....	31
4.4.2	Status Commands.....	35
4.4.3	Bar Code Commands.....	35
4.4.4	Counter Commands	36

4.4.5	Top of Form Commands	38
4.4.6	Page Mode Commands.....	38
4.4.7	NV Memory and Down Load Bit Images Commands	41
4.4.8	Seldom Used Commands.....	43
4.5	Descriptions of Commands.....	46
4.5.1	Set Print Mode.....	46
4.5.2	Set Bit Image Mode.....	46
4.5.3	Set Raster Bit Image Mode	Error! Bookmark not defined.
4.5.4	Set and Process Graphics Data	49
4.5.5	Status Commands.....	54
4.5.6	Enable/Disable Auto Status Back (ASB) mode	55
4.5.7	Status Bytes Transmitted	55
4.5.8	Bar Code Command.....	56
4.5.9	GS k +m +n +d1~dn [1D 6B +m +n (DATA)]	57
4.6	Serial (RS232C) Interface	59
4.6.1	Serial (RS232C) Interface Specification	59
4.6.2	Serial I/O Connector.....	59
4.6.3	Flow Control	60
4.7	Centronics Parallel (IEEE-1284) Interface	62
4.7.1	Parallel I/O Connector	62
4.8	USB 2.0 Interface	63
4.9	Ethernet Interface	64
5	Drivers for the Printer	69
6	Specifications.....	70
6.1	General Specifications	70
6.2	Character Sets	71
6.2.1	Overview	71
	PC437 U.S.A., Standard Europe Character Set.....	72
	Katakana Character Set.....	73
	PC850 (Multilingual) Character Set	74
	PC860 (Portuguese) Character Set	75
	PC863 Canadian French Character Set.....	76
	PC865 Nordic Character Set.....	77
	WPC 1252 Character Set	78
	PC866 Cyrillic #2 Character Set.....	79
	PC852 Latin 2 Character Set	80

PC858 Euro Character Set	81
6.3 Dimensional Drawings of the MTP-1530II (80 mm)	82

1 General

The MTP-1530II series of modular thermal printers is designed specifically for the high performance, size and durability requirements of cut and drop applications. The compact size and high performance characteristics, coupled with its rugged design also make it ideal for the kiosk environment.

Here are some common options for the MTP-1530II Printer. Please note that all the options listed below are for use with 80mm (3.15 inch) wide paper:

MTP-1530II Option Description	Telpar Part Number
RS-232 Serial Communication, Full Cut Document	901033-0202
RS-232 Serial Communication, Partial Cut Document	901033-0212
Parallel Communication, Full Cut Document	901033-0203
Parallel Communication, Partial Document	901033-0213
USB Communication, Full Cut Document	901033-0201
USB Communication, Partial Cut Document	901033-0211
Ethernet (network) Communication, Full Cut Document	901033-0204
Ethernet (network) Communication, Partial Cut Document	901033-0214

1.1 Definitions

1.1.1 Standard Mode versus Page Mode

The printer operates in two print modes: standard mode and page mode. In standard mode, the printer prints and feeds paper each time it receives print data or paper feed commands. In page mode, all the received print data and paper feed commands are processed in the specified memory, and the printer executes no operations. All the data in the memory is then printed collectively when an **ESC FF** or **FF** command is received.

For example, when the printer receives the data "ABCDEF" <LF> in standard mode, it prints "ABCDEF" and feeds the paper by one line. In page mode, "ABCDEF" is written to the specified printing area in memory, and the position in memory for the next print data is shifted by one line.

The **ESC L** command puts the printer into page mode, and all commands received thereafter are processed in page mode. Executing an **ESC FF** command prints the received data collectively, and executing an **FF** command restores the printer to standard mode after the received data is printed collectively. Executing an **ESC S** command restores the printer to standard mode without printing the received data in page mode; the received data is cleared from memory instead.

1.1.2 Hex Dump Mode

This function is sometimes useful for diagnosis of application programs when the printer does not perform as expected. In hex dump mode, the printer prints the hexadecimal code for each character received rather than processing the data as printable text and as control commands. The exception is that DLE EOT (real time STATUS request) and DLE ENQ (Real time request to printer) are executed as received even in hex dump mode. The hexadecimal notation is printed at 10 characters per line on the left side of the page and the printable characters (when possible) are printed on the right side of the page. Control codes print as periods on the right side section of the printout to help locate specific areas of the message to see what codes were actually received by the printer. After all data has been sent to the printer, pressing the paper feed button will flush the buffer and print the last line of data received.

Hex dump mode is initiated in any of three ways:

- 1) Open the platen, hold the paper feed button down, turn on power, then close the platen and release the paper feed button.
- 2) Set DIP switch DPSW2 position 5 ON and then turn on power.

- 3) Send the appropriate GS (A command. On entering hex dump mode, the printer prints a 4 line header "Hexadecimal Dump", a blank line, "To terminate hexadecimal dump", "press FEED three times."

Hex dump mode is terminated by

- 1) pressing the paper feed button three times in quick succession or
- 2) by turning DIP switch DPSW2 position 5 OFF and turning power back on.

Print Sample

```
Hexadecimal Dump
To terminate hexadecimal dump,
Press Feed button three times.

1B 21 00 1B 26 02 40 40 1B 69          .!..&.@ @.I
1B 25 01 1B 63 34 00 1B 30 31          .%...c4..01
41 42 43 44 45 46 47 48 49 4A          A B C D E F G H I J

*** COMPLETED ***
```

Hex Dump of Print Sample

1.1.3 Explanation of Terms used throughout this manual

Receive buffer – Receives data from the host and stores the data temporarily until it can be processed to the print buffer or processed as otherwise required.

Print buffer – Stores the image data to be printed.

Start of line – There is no print data in the print buffer and the print position is not specified by ESC \$ or ESC \. Many commands are effective only at the start of line.

Printable area – For both Standard Mode and Page Mode the length in the horizontal direction is 72 mm (576 dots per line/8 dots per mm) for an overall 80 mm paper width.

In page mode the length in the vertical direction is 92 mm (738 dots per line/8 dots per mm) for an overall 80 mm paper width version.

Printing area – Printing range set by command. The printing area must be less than or equal to the printable area.

MBS – Most Significant Bit of a byte of data.

LBS – Least Significant Bit of a byte of data.

OFF LINE – There is no switch for setting the printer On Line or Off Line. The printer automatically goes Off Line in the following cases:

- a. During power on (or reset through the I/O connector) until the printer is ready to receive data.
- b. During self test.
- c. While feeding paper with the paper feed button.
- d. When out of paper.
- e. When the print platen is open.
- f. During a macro execution and in standby status.
- g. When an error occurs.

1.2 Applications for the MTP-1530II Printer

- Parking ticket dispensing
- Automated Teller Machines (ATMs)
- Gaming receipts
- Interactive media kiosks

1.3 Standard Features

- Direct thermal printing
- Interfaces:
 - ⇒ **Serial (RS232),**
 - ⇒ **Parallel (IEEE1284),**
 - ⇒ **USB 2.0,**
 - ⇒ **Ethernet (10BASE-T and 100BASE-TX)**
- Paper widths -- 80 mm (3.15 in)
- Full or Partial Document Cutter – specified at time of order.
- All metal construction
- Paper low sensor
- Paper auto load function
- ESC/POS^{® 1} The commands conform to ESC/POS, which is a standard in the distribution industry.
- Print Speed – 250 mm/s
- DIP switches accessible without removing cover.
- Paper capacity: 152 mm (6 in) diameter roll with 50 mm diameter core
- Overall size including 152 mm (6 inch) diameter roll of paper:
169.8 mm x 150.3 mm x 243.4 mm (6.68 in H x 5.92 in W x 9.58 in D)
- Inverted print mode
- Character code tables: PC437 (USA, default), Katakana, PC850 (Multilingual), PC860 (Portuguese), PC863 (Canadian-French), PC865 (Nordic), WPC1252, PC866 (Cyrillic2), PC852 (Latin2), PC858 (Euro), Space page.
- International character set: Control Boards, have the following: U.S.A., France, Germany, England, Denmark (2 choices), Sweden, Italy, Spain (2 choices), Japan , Norway, Latin America, Korea.
- Barcode embedded symbologies: UPC-A, UPC-E, JAN(EAN) 13, JAN(EAN)8, 3 of 9, ITF, CODABAR, Code93, and Code128. Ladder Bar codes can be printed when using Page Mode.
- Bit image mode
- Reverse video mode
- Underline printing
- Continuous roll paper
- Page Mode
- Two character font sizes. Each can be printed from 1 to 8 times normal width and/or 1 to 8 times normal height.
- “Smoothing” command (see GS b) – applies only in Page mode.
- Black Mark sensing.

¹ ESC/POS is a registered trademark of SEIKO EPSON Corp.

1.4 Specifications

- Resolution: 8 dots/mm (203 dots/in).
- Paper thickness: 0.056 µm to 0.15 µm maximum (0.0022 in to 0.0059 in).
- Operating temperature: -20° C to 70° C (-4° F to 158° F).
- Operating humidity: 10-80% RH (non-condensing, 34°C {93.2°F} is assumed at 80%).
- Peak current for head drive is 6.7A at the moment that all dots are energized.
- Weight: Approx. 3.6lbs (1.6Kg)
- Expected life of mechanism: 15 million lines.
- Expected life of cutter: 1 million cuts.

1.5 Power Supply Requirements

1.5.1 Voltage: 24 VDC ±10%

Current Requirements	
Peak Current (approximately)	6.7 Amps
Mean Current (approximately)	3.0 Amps
Stand-by	0.1 Amps

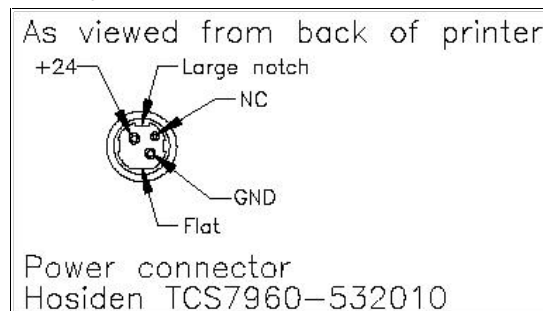
Table 1 Current Requirements

If the number of dots that are energized at the same time is increased, a higher current will flow; therefore, the user should use power supplies with a current capacity adequate for the corresponding print duty.

1.5.2 Power Supply Option from Telpar

(Telpar Part Number 103929-0200) Telpar offers a safety agency approved 100 to 240 VAC (50/60Hz) input to 24VDC output power supply suitable for most printing applications which use the MTP-1530II Printer. Please ask the Telpar Sales Team for more information.

1.5.3 3-Pin Hosiden Connector on Printer for Power Supply Connection



3-Pin Hosiden Power Supply Connector

1.6 Telpar Roll Paper for the MTP-1530II Printer

Telpar Part Number 251103-8006. Thermal sensitive coating is on the “inside” of the roll. 52 mm (6 in) outside diameter, 80 mm (3.15 in) wide, length 180 m (590 ft). For use with the standard 44.5mm diameter (1.75 in diameter) MTP-1530II printer spindles.

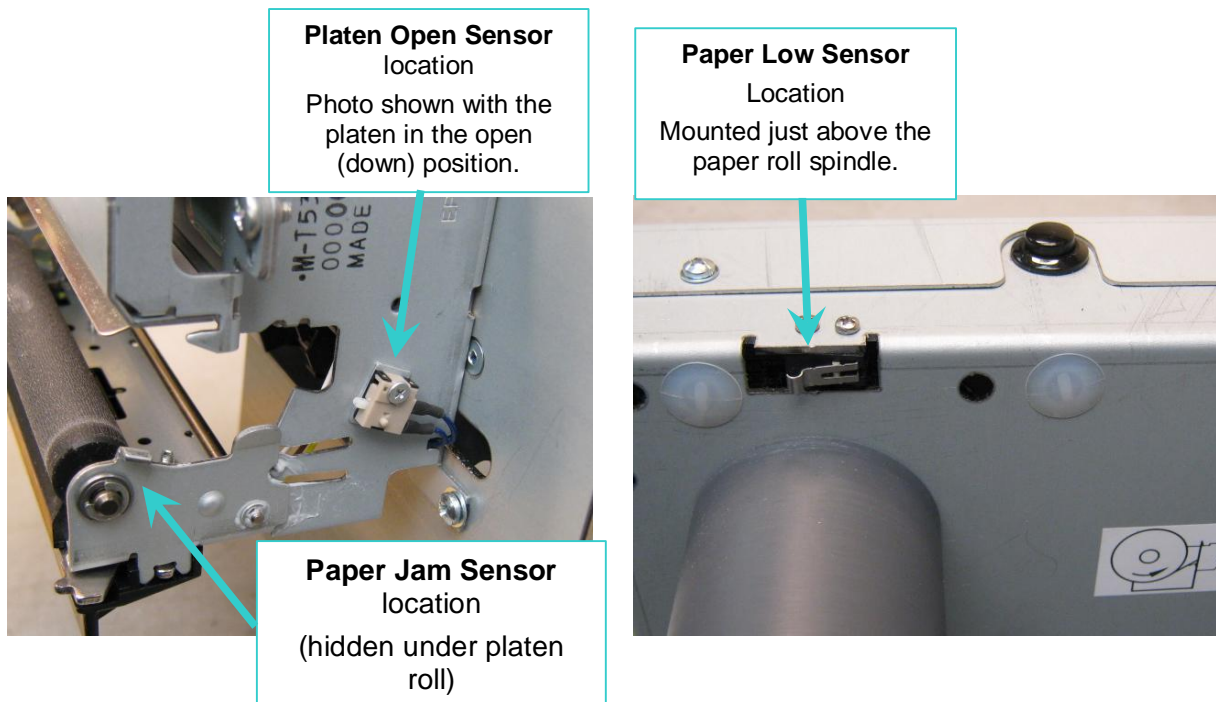
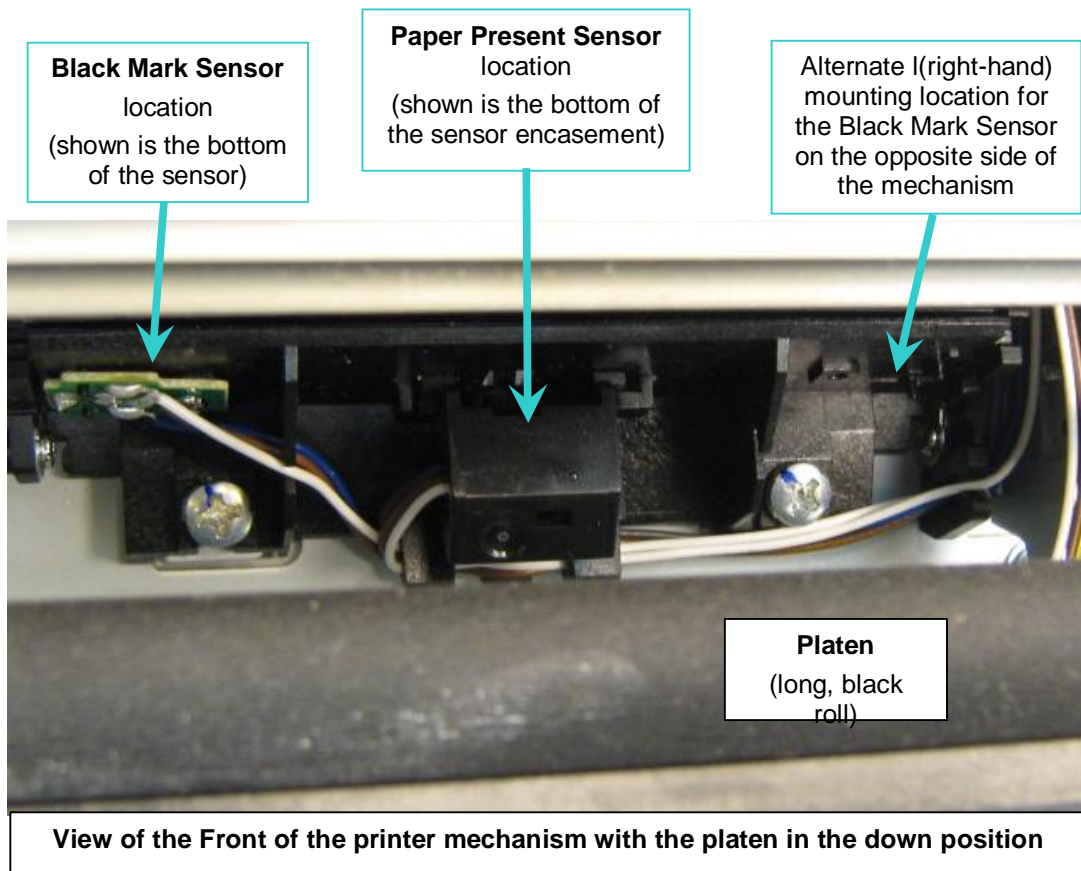
Specific to Thermal Printers: Telpar, does not warranty damages to the thermal print head as a result of printing with thermal paper not specified or approved by Telpar,

1.7 Sensor Locations and Functions:

The MTP-1530II has six sensors that detect various changes in conditions relating to printer operation which may alter the course of action the printer will take depending upon the change detected. The six sensors are listed, described and shown below in this section:

- 1) Print-head Temperature Sensor:** A thermistor sensor detects the temperature of the printhead. The printer stops printing operation if the print-head Temperature is 75°C (167°F) or higher. The printer resumes normal operation after the print-head cools off to 70°C (158°F) or lower. (No photo is available for this sensor.)
- 2) Paper Present Sensor** (also know as the **Paper End Sensor**): This sensor detects whether or not paper has been loaded into the printer. It triggers the automatic paper feeding operation when paper is initially fed into the printer mechanism. It also detects when paper has run out at which time the printer stops all printing operations until additional paper has been successfully fed into the printer.
- 3) Platen Open Sensor:** A small micro-switch detects whether or not the printer's platen (long, rubber roll) has been lowered away from the print-head mechanism (as shown in the photo below). Printing operation will not be allowed while this sensor detects that the platen is not locked in place against the print mechanism.
- 4) Paper Jam Sensor:** This sensor, located near the platen (long, rubber roll) detects whether or not paper has started to wrap around the platen which would result in a paper jam. If this sensor detects that the paper is wrapping around the platen, all printing operation will stop until the jam is cleared and the paper path is returned to normal. If a paper jam does occur, turn the printer off, carefully remove the jammed paper, and then turn the printer on again.
- 5) Paper Low Sensor:** A small micro-switch mounted on the side of the chassis (see photo below) detects the presence of a paper roll diameter that is approximately 2.8 to 2.9 inches (mm) or greater. If the roll falls below this diameter, then the PAPER OUT LED (middle LED on the printer's control board – see section 4.1.1) lights to alert that the paper roll is getting low. If Escape Command **ESC c 4** has been sent to the printer prior to the paper low condition and the paper level falls below the micro-switch sensor, then the printer will stop printing operation immediately.
- 6) Black Mark Sensor** (please reference section 2.2.2 for more information on Black Mark detection): This sensor detects a black mark that has been pre-printed on the side of the paper. Usually the black mark denotes the top or starting point of each individual receipt contained in a continuous roll of pre-printed paper. If the paper you are using has black marks pre-printed on it and you wish to have the printer detect the presence of these black marks, you must have DIP Switch 1, position 1 set to the ON (or up) position (see section 4.1).

NOTE: Typically, the Black Mark sensor is located on the left-hand side of the printer as looking from the front (see photo below). Therefore, this only detects the black mark on that side of the paper. If the black mark is located on the other side of the paper, the Black Mark sensor can be physically moved to its right-hand mounting position on the opposite side of the mechanism (one small screw must be removed to remove the sensor).



2 Operator Instructions

2.1 Unpacking and Inspection

Carefully unpack and inspect your MTP-1530II for any damage that may have occurred in transit. Should any damage have occurred, notify Telpar, save the shipping carton and packing materials, and file a damage claim with the carrier. Specify the nature and the extent of the damage. Before installing or operating the printer, check the following:

- Printer mechanism and paper path are clear of all packing materials or other foreign matter.
- Paper is installed. DO NOT OPERATE the printer without paper. Refer to Section 2.2 - Paper Loading page 15 for paper loading instructions.

2.2 Paper Loading

2.2.1 Side-Loading Roll

The MTP-1530II series printer is configured as a side-loading printer. Slide roll of paper over spindle with paper fed under the bottom toward paper slot (front of unit).

To load paper, turn on the power and feed the straight edge of the paper into the paper guide. AUTOLOAD will automatic load paper once it is fed into the paper guide. Once paper has been initially loaded, the paper feed button may be used. Ensure that the paper is installed correctly and feeding properly with the thermal side facing up.

2.2.2 Black Mark Sensors Load

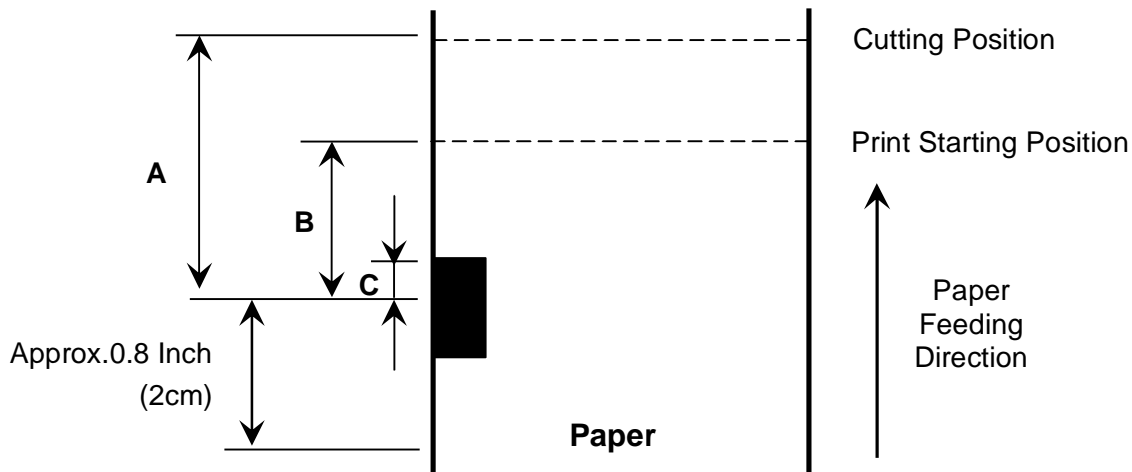
The MTP-1530II series printer may be used with the optional Black Mark Sensor. This requires the use of a pre-printed Top of Form (TOF) Mark or Black Mark on the form. Dip switch SW1 position 1 must be set to the ON position to enable black mark operation.

If DIP switch DSW1 position 1 is turned on to enable the Black Mark sensor when the printer is loaded with plain paper, at Power On the printer will feed about 17.5 inches of paper looking for a Black Mark and then go to an error mode since it did not find a Black Mark.

To load paper, turn on the power and feed the straight edge of the paper into the paper guide. Ensure that the paper is installed correctly and feeding properly with the thermal side facing up.

If using perforated paper, the perforation should be fed at least 1.27 mm (0.05 in) past the cut line to avoid a jam at the cutter.

The BM is detected at the position which the top edge of the BM comes into approximately 0.02 to 0.08in (0.5 to 2 mm) from the center of the BM sensor. After detecting the BM, the BM is not detected for approximately 0.79in (20mm).



The Figure above shows the BM Detection Position, Print Starting Position, and the Cutting Position

A: 1.32in (for straight paper-path model) 1.46in (for curled paper-path model)
33.6 mm (for straight paper-path model) 37.2 mm (for curled paper-path model)

B: 0.69in (for straight paper-path model) 0.83in (for curled paper-path model)
17.6 mm (for straight paper-path model) 21.2 mm (for curled paper-path model)

C: Approx. 0.02in to 0.08in
Approx. 0.5 to 2mm

Black Mark Print Starting Position and Cutting Position:

At the factory, the print starting position and the cutting position are set to the print head position and the cutter position respectively when the BM sensor detects the BM.

The print starting position and the cutting position can be changed with the **GS (F** command.

Acceptable Width and Interval of Black Mark:

The width and interval of BM for which the printer operation is guaranteed are as follows:

BM width: 3 to 20 mm {0.12in} to {0.79in}

BM interval: 50 to 300 mm {1.97in} to {11.81in}

2.3 Paper Jam

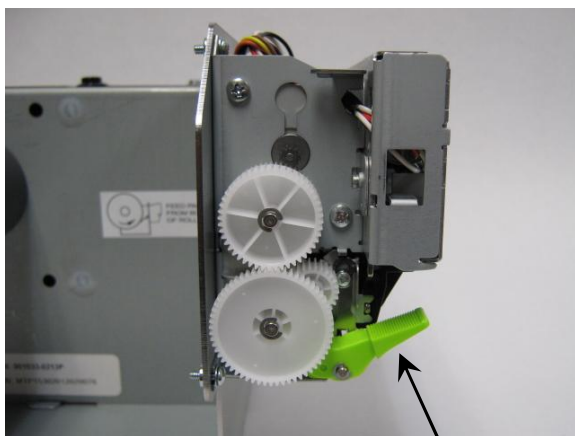
In the event of a paper jam condition do not force paper into the unit, or try to pry the paper out of the unit, this may damage the thermal print mechanism. Caution should be exercised when working next to the cutter mechanism, the blades are sharp and may cause serious injury.

To release paper:

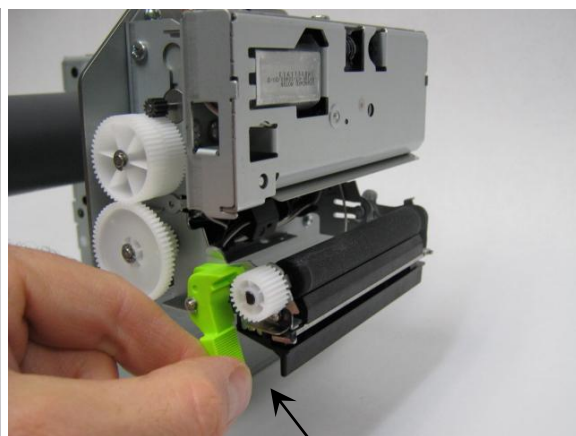
- Turn off power to the printer.
- Push the Head Open lever to the down position.
- Paper can be removed at this time. Once paper is cleared from the mechanism, return the Head Open lever to the up position.

2.3.1 Head Open Lever

The Head Open lever (green) is located at the left front of the printer mechanism as shown in the two pictures below. The up position is ready to print. The down position lowers the platen roller away from the print-head for manually inserting paper or for clearing a paper jam. The down (open) position signals the microprocessor that the head is open so that no printing will occur.



Head Open Lever
(shown in its closed position)



Head Open Lever
(shown in its open position)
Placing the lever in the down position allows for jams near the platen area to be cleared or for loading paper manually.

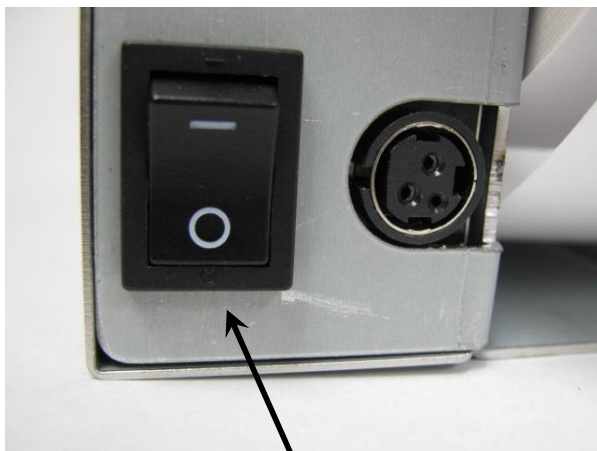
3 Installation

3.1 Self Test Mode

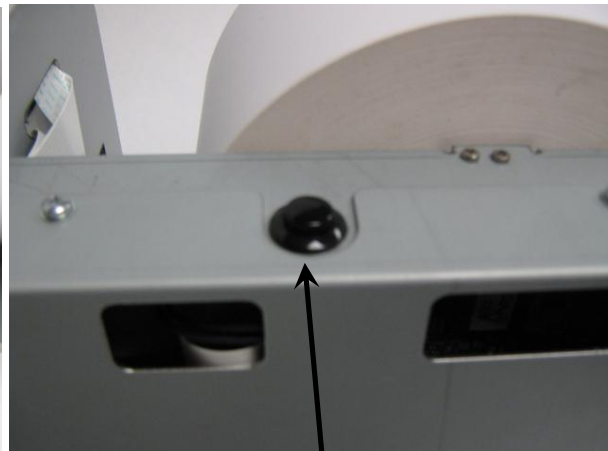
The MTP-1530II has a self-test mode that will print and cut a sample ticket.

To place the unit into self-test mode, first turn power switch off, then press and **hold** the FEED push button switch. Next, place the POWER switch in the ON position to apply power to the printer. Release the FEED Button after printing starts (within 5 seconds). See a sample of a Self Test Printout on the next page.

The first part of the self test message prints several fields showing how the printer is configured. Following the first part of the self test, you have the option of pressing the paper feed button once more to print a “barber pole” pattern print test of ASCII Characters, or turning power off and back on to terminate the self test. The printer goes to the off-line (BUSY) state when self test starts and remains off-line until self test is finished due to either of these actions. All electrical/mechanical portions of the printer are exercised and checked by this action, except for the host-to-printer communication interface components.



The Power Switch is located at the rear of the printer next to the power inlet connector. Pressing the “1” position on the power switch applies power to the printer, and pressing the “0” position on the switch switches off power from the printer.



The Paper Feed Button is located on the top, side chassis of the printer. This button will feed paper through the printer while it is pressed, and the button is also used together with the power button to print a Self Test printout.

```

SELF-TEST

Firmware Version 1.00

Parallel Interface

Buffer Capacity
  4K bytes

Handshaking Operation (busy condition)
  Receive buffer full

Automatic Line Feed
  (CR command function)
  Disabled

Resident Character
  Alphanumeric

Print Density
  LIGHT [ 1 2 3 4 ] DARK
        ^

Power On Status
  Disabled

DIP Switch 1
  1 2 3 4 5 6 7 8
  ON      [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
  OFF     [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

DIP Switch 2
  1 2 3 4 5 6 7 8
  ON     [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
  OFF    [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Memory Switch 1
  1 2 3 4 5 6 7 8
  ON     [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
  OFF    [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Memory Switch 8
  1 2 3 4 5 6 7 8
  ON     [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
  OFF    [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

If you want to continue SELF-TEST
printing, please press FEED button.
```

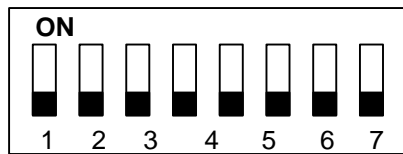
MTP-1530II Self Test Printout

4 Setup and Control of the Printer:

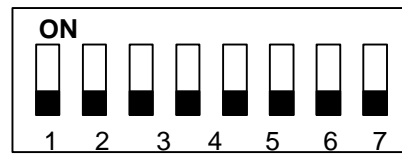
4.1 DIP Switch Settings and Memory Switch Settings

DIP Switch Settings: The MTP-1530II Parallel and Ethernet printers each have a single DIP Switch located on the main circuit board (Labeled “DSW1”), while the Serial (RS-232) printer has two DIP Switches located on the main circuit board (labeled “DSW1” and “DSW2”) The DIP Switch contains a bank of eight individual switches, each of which controls some aspect of the printer and are described in the tables below. The switches can slide up into the “ON” position or down into the “OFF” position. A small tip screwdriver or even a pen tip may be used to change the position of the switches.

The DIP Switch on each type of printer can be accessed through a cutout hole on the metal circuit board cover (see picture below) Therefore, DIP Switch changes can be made without removing the cover. **IMPORTANT NOTE:** If you make any changes to the DIP Switch settings, you must first cycle power to the printer or reset the printer in order for the changes to take place.

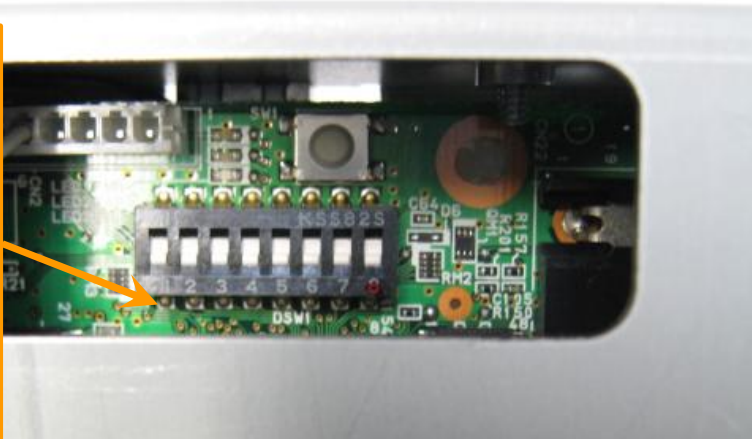


DSW1



DSW2 (RS-232 Serial Printer Only)

DIP Switch Bank for a Parallel Printer as looking through the Chassis.
 Note the numbering below each switch position (1-8, left to right), and “DSW1” labeled on the board directly below the switch. Each individual switch is turned “ON” by sliding it all the way to its up position. Sliding a switch down turns it “OFF”.



DIP Switch 1 (DSW1) Settings					
Switch Position No.	Switch Function Description	Switch Position		Result	Shipping Default
1	Black Mark Sensor (BM Sensor) If this switch is set to the "ON" position, you must use special black mark paper or the printer will go into an error mode! (see section 2.2.2)	OFF		No black mark detection	OFF
		ON		Detects black marks on paper	
2	Setting of Allowable Print Width The MTP-1530II should always have this switch set to the "ON" position.	OFF		640 dots / line	ON
		ON		576 dots / line	
3 and 4	Print Darkness Selection To help achieve the maximum lifespan of the print-head, it is recommended that these switches be set to the lowest intensity level available which still adequately meets the desired print darkness for your printer application.	Switch 3	Switch 4	Darkness Setting	Medium (OFF and OFF)
		ON	ON	Slightly light	
		OFF	OFF	Medium	
		ON	OFF	Slightly dark	
5	Operation Mode	OFF		Normal Printing	OFF
		ON		Hexadecimal Dumping	
6	Factory Setting Fixed to "OFF"	NA		NA	OFF
		NA		NA	
7	Selection of Interface Class Effective with the USB interface type only. Reserved (fixed to Off) with other interface types.	OFF		Vendor Class	OFF
		ON		Printer Class	
8	Reserved Fixed to "OFF"	NA		NA	OFF
		NA		NA	

DIP Switch 1 (DSW1) Settings

DIP Switch 2 (DSW2) Settings – For Serial (RS-232) Communications Only				
Switch Position No.	Switch Function Description	Switch Position	Result	Shipping Default
1	RESERVED Fixed to "OFF"	NA	NA	OFF
2	RESERVED Fixed to "OFF"	OFF	NA	OFF
3	DSR Reset	OFF	Disabled	OFF
		ON	Enabled	
4	Handshaking	OFF	HARDWARE: DTR/DSR or CTS/RTS	OFF
		ON	XON/XOFF	
5	Parity Check	OFF	Disabled	OFF
		ON	Enabled	
6	Parity ODD or EVEN	OFF	ODD	OFF
		ON	EVEN	
7 See Table Below	Transmission Speed (Baud Rate) Switches 7 and 8 control the rate at which the printer receives and transmits information in bits per second (bps). The default value for the RS-232 serial printer is 19200 bits per second, 8 Data Bits (fixed), 1 Stop Bit (fixed), No Parity and Hardware Handshaking.	SEE THE TABLE BELOW TO DETERMINE THE SWITCH SETTINGS FOR POSITIONS 7 and 8 FOR THE VARIOUS BAUD RATES AVAILABLE.		ON
8 See Table Below				OFF

Transmission Speed (Baud Rate) in Bits per second (bps) Pertains to DIP Switch 2 (DSW2) serial printer ONLY and relate to the settings of switch positions 7 and 8.	DIP Switch 2 (DSW2) Switch Position	
	7	8
Auto Detect This setting automatically detects the transmission condition settings of the serial interface (host). Available settings are 2400, 4800, 9600, 19200, 38400, 57600, and 115200.	ON	ON
9600 only	OFF	ON
19200 only	ON	OFF
38400 only	OFF	OFF

There are 8 MEMORY Switches, only four are currently used

Memory Switch 1			
Position	State	Function	Default
1	ON	RESERVED	OFF (0)
	OFF		
2	ON	RESERVED	OFF (0)
	OFF		
3	ON	BUSY condition when buffer is full	OFF (0)
	OFF	BUSY when buffer is full or when OFF-LINE	
4	ON	Receive error is ignored (serial interface only)	OFF (0)
	OFF	Receive error prints "?" (serial interface only)	
5	ON	Auto line feed enabled (Parallel interface only)	OFF (0)
	OFF	Auto line feed disabled	
6	ON	RESERVED	OFF (0)
	OFF		
7	ON	RESERVED	OFF (0)
	OFF		
8	ON	RESERVED	OFF (0)
	OFF		

Memory Switch 5			
Position	State	Function	Default
1	ON	RESERVED	OFF (0)
	OFF		
2	ON	Near Paper End Sensor Installed	ON (1)
	OFF	Near Paper End Sensor NOT Installed	
3	ON	Printer can recover from a recoverable error after a paper jam has occurred	OFF (0)
	OFF	Printer goes Offline after a paper jam has occurred	
4	ON	Enable Paper Jam Detection	OFF (0)
	OFF	Disable Paper Jam Detection	
5	ON	RESERVED	OFF (0)
	OFF		
6	ON	Disable the USB Power Saving Function	OFF (0)
	OFF	Enable the USB Power Saving Function	
7	ON	RESERVED	OFF (0)
	OFF		
8	ON	RESERVED	OFF (0)
	OFF		

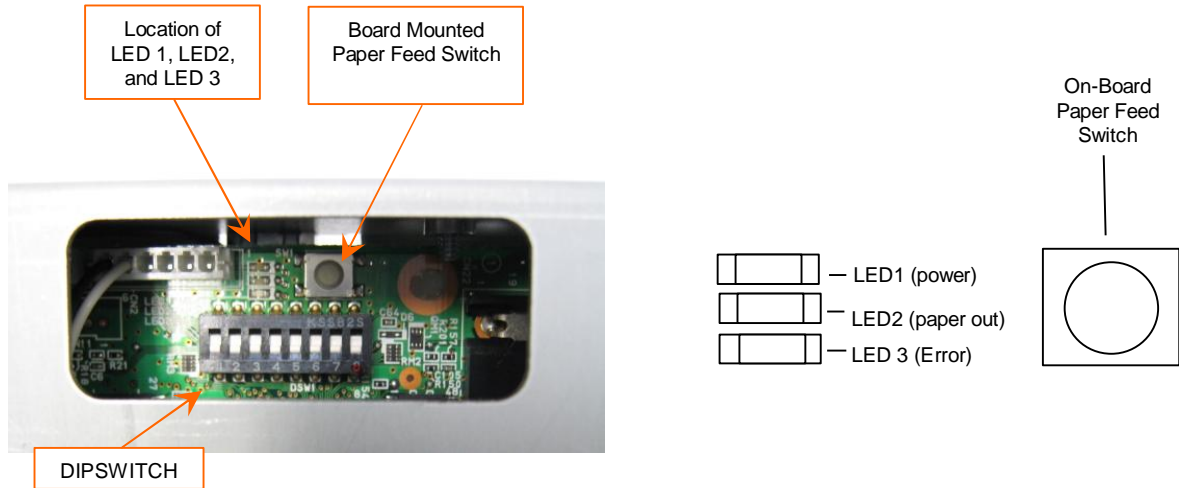
Memory Switch 6				
Position	State	Function	Default	
1	ON	Manual Load of paper (paper fed with platen open) AND If Black Mark Sensor enabled	After the platen is closed, the printer feeds the paper approx. 125mm (5 ") to the Black Mark position , and then cuts it.	OFF (0)
		Auto load of paper AND If Black Mark Sensor enabled	After auto-loading the paper, printer feeds paper to the Black Mark position , and then cuts it.	
		Manual Load of paper (paper fed with platen open) AND If Black Mark Sensor disabled	After the platen is closed, printer does not feed or cut paper.	
		Auto load of paper AND If Black Mark Sensor disabled	After auto-loading the paper, the printer feeds the paper approx. 125mm (5 "), and then cuts it.	
	OFF	Manual Load of (paper fed with platen open) AND If Black Mark Sensor enabled	After platen is closed, printer feeds paper to the Black Mark position , and then cuts it.	
		Auto load of paper AND If Black Mark Sensor enabled	After auto-loading the paper, printer feeds paper to the Black Mark position , and then cuts it.	
		Manual Load of paper (paper fed with platen open) AND If Black Mark Sensor disabled	After the platen is closed, printer does not feed or cut the paper.	
		Auto load of paper AND If Black Mark Sensor disabled	After auto-loading the paper, the printer does not cut the paper.	
2	ON	Disable error signal output	OFF (0)	
	OFF	Enable error signal output		
3	ON	Speed has priority over power consumption	OFF (0)	
	OFF	Power consumption has priority over speed		
4	ON	Disable auto eject when a paper out is detected	OFF (0)	
	OFF	Enable auto eject when a paper out is detected		
5	ON	RESERVED	OFF (0)	
	OFF			
6	ON	Enable if using thick type paper (paper which has excellent keeping quality)	OFF (0)	
	OFF	Enable if using normal paper		
7	ON	Detect near end of paper roll by using the Black Mark sensor	OFF (0)	
	OFF	Detect near end of paper roll by using the Near End sensor		
8	ON	Disable selection of the operation by GS FF	OFF (0)	
	OFF	Enable selection of the operation by GS FF		

Memory Switch 8			
Position	State	Function	Default
1 and 2	Both OFF	Non-divided energization mode	Both OFF (0)
	1 = ON 2 = OFF	Two part energization mode	
	1 = ON or OFF 2 = ON	Four-part energization mode	
3	ON	Enable backwards paper feeding	OFF (0)
	OFF	Disable backwards paper feeding	
4	ON	Autocutter is NOT installed	OFF (0)
	OFF	Autocutter is installed	
5	ON	Discards receive data when printer is offline	OFF (0)
	OFF	Keeps receive data when printer is offline	
6	ON	Backwards paper feeding amount = 88 steps	OFF (0)
	OFF	Backwards paper feeding amount = 108 steps	
7	ON	Enable test print when paper is loaded	OFF (0)
	OFF	Disable test print when paper is loaded	
8	ON	Does NOT initialize for Black Mark position when power is turned on	OFF (0)
	OFF	Initializes for Black Mark position when power is turned on	

Note: Not all printer mechanisms allow reverse paper feeding. If reverse feeding is allowed, after cutting the paper with a GS V command, paper feeds backwards. The print starting position adjustment with GS (F can be set to the backward direction relative to the cutting position. In this case, the maximum backward feed length is 14 mm (112 * 0.125mm).

4.2 LEDs and Error Indication

Three LEDs (LED1, LED2, and LED 3) are located below the cutout in the side chassis (above the DIPSWITCH and next to the on-board paper feed switch) as shown in the picture and figure below.



LED 1 POWER LED: ON means power is stable and the printer is ready for operation. OFF means power is not stable.

LED 2 is a **PAPER OUT LED**, OFF means paper is installed and the printer is ready for operation. ON means there is no paper installed in the printer mechanism (or the paper low sensor is selected). The PAPER OUT LED blinks steadily to specify that self test has finished the first part of printing and that the user can press the PAPER FEED button to print the “barber pole” character print part of the self test. The PAPER OUT LED also blinks steadily to specify that a MACRO is waiting for the user to press the PAPER FEED button to continue its execution (macro stand-by mode).

LED 3 is an **ERROR LED**. OFF means there are no errors and the printer is ready for operation. ON indicates the printer is OFF LINE (except during paper feeding using the FEED button, during self-test printing, and in the error state). The ERROR LED blinks a defined pattern every 5.12 seconds to notify the user of various error conditions. When the LED is normally OFF and blinks ON, an error is indicated which may be recoverable. . When the LED is normally ON and blinks OFF, an error is indicated which is not recoverable. For any error that is not recoverable, power should be turned off as soon as possible.

ERROR LED Blink Rate and Recovery Method Table (below):

Blink Rate	Error	Description	Recovery method
Continuous (no pauses)	Print head Temperature too high error	Print head Temperature is 75°C (167°F) or higher.	Automatic when the print head cools off to 70°C (158°F) or lower.
1 blink ON then a paused OFF condition before the cycle starts again (each cycle is approx. 5 seconds long).	Cutter error	The cutter has failed to complete a cut	Recovers by DLE ENQ1 or DLE ENQ2 after the cutter Jam has been corrected.
1 blink OFF then a paused ON condition before the cycle starts again (each cycle is approx. 5 seconds long).	PCB connection error	The printer mechanism is not connected or the internal wiring is incorrect.	NOT RECOVERABLE! Turn power off and check connections between the printer mechanism and the controller board.
2 blinks ON then a paused OFF condition followed by another blink ON and a shorter paused OFF before the cycle starts again (each cycle is approx. 5 seconds long).	Black Mark sensor detection error	No Black Mark was detected (even though the roll of paper may be marked correctly)	Recovers by DLE ENQ1 or DLE ENQ2 when the paper with the black mark is inserted correctly again.
1 blink OFF then a paused ON condition followed by another blink OFF before the cycle starts again (each cycle is approx. 5 seconds long).	Read/Write error	The CPU has detected a memory Read/Write error	NOT RECOVERABLE! Cycle power off and on to see if the error goes away.
2 blinks OFF then a paused ON condition followed by another blink OFF before the cycle starts again (each cycle is approx. 5 seconds long).	High voltage	The power supply voltage is too high	NOT RECOVERABLE! Turn power OFF; correct the problem before turning back on.
3 blinks OFF then a paused ON condition followed by another blink OFF before the cycle starts again (each cycle is approx. 5 seconds long).	Low voltage	The power supply voltage is too low.	NOT RECOVERABLE! Turn power OFF; correct the problem before turning back on.
4 blinks OFF then a paused ON condition followed by another blink OFF before the cycle starts again (each cycle is approx. 5 seconds long).	CPU error	The CPU executes an incorrect address or the I/F board is not connected.	NOT RECOVERABLE! Cycle power off and on to see if the error goes away.
6 blinks ON then a paused OFF condition before the cycle starts again (each cycle is approx. 5 seconds long).	Platen open	Print is not performed due to the platen being open	Recovers by DLE ENQ1 or DLE ENQ2 after the platen is closed.
4 blinks ON then a paused OFF condition before the cycle starts again (each cycle is approx. 5 seconds long).	Paper Jam Error	A paper Jam has occurred.	Open the platen and remove the jammed paper. Recovers by DLE ENQ1 or DLE ENQ2 .

Printer operation when an error occurs:

The printer executes the following operations when detecting an error.

- Stops all printer operations for the selected paper section.
- Goes BUSY (When memory switch 1-3 is set to off to go BUSY during printer offline.).
- Flashes the ERROR LED.

4.3 Control Codes and Control Sequences List

		Location of Definition	Class	Standard mode	Page mode
HT	Horizontal tab	General	Execute	Yes	Yes
LF	Print and line feed	General	Execute	Yes	Yes
FF	PAGE MODE, print and return to standard mode	PAGE	Execute	Ignored	Yes
	Black Mark mode, print and feed to print starting position (Black Mark)	General, Top of Form	Execute	Yes	Disabled
CR	Print and carriage return	General	Execute	Yes	Yes
CAN	Cancel print data	PAGE	Execute	Ignored	Yes
DLE EOT	Real time status request	STATUS	Execute	Yes	Yes
DLE ENQ	Real time request to printer	General	Execute	Yes	Yes
ESC	Escape sequence header	---	---	---	---
FS	FS sequence header	---	---	---	---
GS	GS sequence header	---	---	---	---
ESC FF	Print data	PAGE	Execute	Ignored	Yes
ESC SP	Set right side character spacing	General	Setting	Yes	Yes
ESC !	Set print mode(s)	General	Setting	Yes	Yes
ESC \$	Set absolute print position	General, PAGE	Execute	Yes	Yes
ESC %	Select/cancel user-defined character set	Seldom	Setting	Yes	Yes
ESC &	Define user-defined characters	Seldom	Setting	Yes	Yes
ESC *	Select bit image mode	General	Execute	Yes	Yes
ESC -	Turn underline on/off	General	Setting	Yes	Yes
ESC 2	Select default line spacing	General	Setting	Yes	Yes
ESC 3	Set line spacing	General	Setting	Yes	Yes
ESC ?	Cancel user-defined characters	Seldom	Setting	Yes	Yes
ESC @	Initialize printer	General	Execute, Setting	Yes	Yes
ESC D	Set horizontal tabs	General	Setting	Yes	Yes
ESC E	Turn emphasized on/off	General	Setting	Yes	Yes
ESC G	Turn double-strike on/off	General	Setting	Yes	Yes
ESC J	Print and feed paper	General	Execute	Yes	Yes
ESC L	Select PAGE MODE	PAGE	Execute	Start line	Ignored
ESC M	Select character font	General	Setting	Yes	Yes
ESC R	Select international character set	General	Setting	Yes	Yes
ESC S	Select standard mode	PAGE	Execute	Ignored	Yes
ESC T	Select print direction	PAGE	Setting	Value	Yes
ESC V	Turn rotated print on/off	General	Setting	Yes	Value
ESC W	Set printing area	PAGE	Setting	Value	Yes
ESC \	Set relative print position	General, PAGE	Execute	Yes	Yes
ESC a	Select justification	General	Setting	Start line	Value
ESC c 3	Select paper sensors to output paper out signal	General	Setting	Yes	Yes

ESC c 4	Select paper sensors to stop printing	General	Setting	Yes	Yes
ESC c 5	Enable/disable panel buttons	General	Setting	Yes	Yes
ESC d	Print and feed n lines	General	Execute	Yes	Yes
ESC t	Select character code table	General	Setting	Yes	Yes
ESC {	Turn inverted print on/off	General	Setting	Start line	Value
FS p	Print NV bit image OBSOLETE – Use GS (L<Function 69> instead	NV & DL	Execute	Yes	Disabled
FS q	Define NV bit image OBSOLETE – Use GS (L<Function 67> instead	NV & DL	Setting	Start line	Disabled
GS FF	Feed paper to Black Mark	Top of Form	Execute	Yes	Yes
GS !	Select character size	General	Setting	Yes	Yes
GS \$	Set absolute vertical print position	PAGE	Execute	Ignored	Yes
GS *	Define download bit image	NV & DL	Setting	Yes	Yes
GS (A	Execute test print	General	Execute	Yes	Ignored
GS (E	User setup commands	Seldom	Execute, Setting	Start line	Disabled
GS (F	Set adjustment values	Seldom	Setting	Yes	Yes
GS (M	Customize printer control values	Seldom	Setting	Start line	Value
GS /	Print download bit image	NV & DL	Execute	Empty	Yes
GS :	Start/end macro definition	Seldom	Execute, Setting	Yes	Yes
GS B	Set reverse video on/off	General	Setting	Yes	Yes
GS C 0	Select counter print mode	Counter	Setting	Yes	Yes
GS C 1	Select count mode (A)	Counter	Setting	Yes	Yes
GS C 2	Set counter	Counter	Setting	Yes	Yes
GS C ;	Select count mode (B)	Counter	Setting	Yes	Yes
GS E	Select head control method	Seldom	Setting	Yes	Yes
GS H	Select printing position of HRI characters	Bar Code	Setting	Yes	Yes
GS I	Transmit printer ID	Status	Execute	Yes	Yes
GS L	Set left margin	General	Setting	Start line	Value
GS T	Set print position to beginning of line	General	Execute	Yes	Ignored
GS V	Select cut mode and cut paper	General	Execute	Start line	Yes
GS W	Set printing area width	General	Setting	Start line	Value
GS \	Set relative vertical printing position	PAGE	Execute	Ignored	Yes
GS ^	Execute macro	Seldom	Execute	Yes	Yes
GS a	Enable/disable Auto Status Back (ASB)	Status	Execute, Setting	Yes	Yes
GS b	Turn smoothing mode on/off		Setting	Yes	Yes
GS c	Print counter	Counter	Execute	Yes	Yes
GS f	Select font for HRI characters	Bar Code	Setting	Yes	Yes
GS h	Set bar code height	Bar Code	Setting	Yes	Yes
GS k	Print bar code	Bar Code	Execute	Empty	Yes

GS r	Transmit status	Status	Execute	Yes	Yes
GS v 0	Print raster bit image OBSOLETE – Use instead GS (L<Function 112 + 50>	General	Execute	Empty	Disabl ed
GS w	Set bar code width	Bar Code	Setting	Yes	Yes
GS (L, GS 8 L	Specify graphic data	Graphics	Setting and execute	Yes	Yes

Control Codes and Control Sequences

List of Control Codes and Control Sequences Locations	
Control Codes	Control Sequences
Bar Code	See 4.4.3 Bar Code Commands page 35
Counter	See 4.4.4 Counter Commands page 36
General	See 4.4.1 General Usage Print Commands page 31
NV & DL	See 4.4.7 NV Memory and Down Load Bit Images Commands page 41
Page	See 4.4.6 Page Mode Commands page 38
Seldom	See 4.4.8 Seldom Used Commands page 43
Status	See 4.4.2 Status Commands page 35
Top of Form	See 4.4.5 Top of Form Commands page 38
Disabled	Parameters will be processed as normal data.
Empty	Enabled only when at the beginning of a line.
Ignored	Command code and parameters are ignored.
Start line	Enabled only when there is no data in the print buffer
Yes	Function is enabled.

List of Control Codes and Control Sequences Locations

4.4 Control Codes and Control Sequences Definition

4.4.1 General Usage Print Commands

General Usage Print Commands			
Name	Command ASCII	Command (hex) +n = data byte[hex]	Description
Tab	HT	09	Move the print position to the next horizontal tab position. Default is a TAB position every 8 columns. See ESC D.
Line feed	LF	0A	Print data and feed paper. Default line spacing = 3.75mm. See ESC 2 and ESC 3
Form feed	FF	0C	See Top of Forms Commands. See Page Mode Commands.
CR	CR	0D	If parallel interface is selected and automatic line feed is enabled (Memory Switch 1-5) then CR is treated as LF. See LF.
Real-time request to printer	DLE ENQ +n	10 05 +n	+n=01hex, Recover from error and restart printing from the line where the error occurred. +n=02hex, Recover from an error after clearing the receive and print buffers.
ESC	ESC	1B	ESC Sequence Header
FS	FS	1C	FS Sequence Header.
GS	GS	1D	GS Sequence Header.
Set right side character spacing	ESC (SP) +n	1B 20 +n	Set spacing to the right of each character to n x 0.125 mm (n x 0.0049"). Doubled for Double Wide. Does not affect the Kanji character set. Set values independently in Page and Normal modes.

Set Print mode	ESC ! +n	1B 21 +n	Set Print mode. See Section 4.5.1 - Set Print Mode. See ESC M, ESC E, ESC -, GS!.
Set absolute print position	ESC \$ +n +m	1B 24 n m	Current print position is set to (n + m x 256) x 0.125 mm from the beginning of the line. See ESC \, GS \$, GS\ . See Page mode.
Select Bit Image mode	ESC +m +n1 +n2 +d1~dn	1B 2A +m +n1 +n2 (data)	Set Bit Image mode. See 4.5.2. - Set Bit Image Mode
Turn underline mode on/off	ESC - +n	1B 2D +n	n=0 (00 or 30 hex) Turn underline off. n=1 (01 or 31 hex) Turn on 1 dot line high underline. n=2 (02 or 32 hex) Turn on 2 dot line high underline. See ESC !.
Set default line spacing	ESC 2	1B 32	Set 3.75 mm line spacing (30 dot lines). See ESC 3.
Set Line feed pitch	ESC 3 +n	1B 33 +n	Set single line spacing to n dot lines (n x 0.125mm). Set independently in Page and Normal mode. Default = 30. See ESC 2.
Printer reset	ESC @	1B 40	Resets the printer to the mode it was in when power was turned on. Clears the data in the print buffer but does not the data in the receive buffer. The DIP switches and MEMORY switches are not rechecked. The MACRO definition is not cleared.
Set Horizontal Tab positions	ESC D +d1~dn NUL	1B 44 (DATA) 00	Set from 1 to 32 tab positions. Data values range from 1 to 255 in ascending order. If a data value is less than the previous data value, this command is terminated. NUL terminates this command when less than 32 TAB positions are being set. ESC D NUL clears all tab positions. Default is every 8 columns.
Turn emphasized mode on/off	ESC E +n	1b 45 +n	LSB = 0 Turn emphasized mode off. LSB = 1 Turn emphasized mode on. See ESC !.
Turn double-strike mode on/off	ESC G +n	1B 47 +n	LSB = 0 Turn double strike mode off. LSB = 1 Turn double strike mode on. Printout is the same as emphasized. See ESC E.

Name	Command ASCII	Command +n = data byte[hex]	Description
Forward paper feed for <i>n</i> dot lines	ESC J + <i>n</i>	1B 4A + <i>n</i>	Print if needed then feed paper <i>n</i> dot lines. Range = 0 to 255dec. If BM is enabled, this command can feed paper past the mark.
Select character font	ESC M + <i>n</i>	1B 4D + <i>n</i>	<i>n</i> =0 (00 or 30 hex) selects FontA (12x24). <i>n</i> =1 (01 or 31 hex) selects FontB (9x17). See ESC !
Select International character set	ESC R + <i>n</i>	1B 52 + <i>n</i>	Select international character set. See Section Error! Reference source not found. – Error! Reference source not found. +++ reprint section
Rotate print	ESC V + <i>n</i>	1B 56 + <i>n</i>	<i>n</i> = 1 (01 or 31 hex) Rotate the print 90 degrees clockwise. <i>n</i> = 0 (00 or 30 hex) Cancel the rotation. Rotated characters do not get underlined. Double wide becomes double high and double high becomes double wide. Not Page mode. See ESC ! and ESC -.
Set relative print position	ESC \ + <i>n</i> + <i>m</i>	1B 5C <i>n</i> <i>m</i>	Set printing to current print position + (<i>n</i> +(<i>m</i> *256)). Ignored if specified setting exceeds the printable area. See Page mode.
Select justification	ESC a + <i>n</i>	1B 61 <i>n</i>	<i>n</i> =0 (0 or 30 hex) Left justify. <i>n</i> =1 (01 or 31 hex) Center justify. <i>n</i> =2 (02 or 32 hex) Right justify. Normal mode only, must be received at the start of a line. See HT, ESC \$, and ESC \.
Select paper sensors to output paper end status	ESC c 3 + <i>n</i>	1B 63 33 + <i>n</i>	Bit 1 enables or disables the paper low sensor. Bit 3 enables or disables the paper out sensor. A value of 1 enables and a value of 0 disables. Applies to the parallel interface ONLY.
Select paper sensor to stop printing	ESC c 4 + <i>n</i>	1B 63 34 + <i>n</i>	Setting bit 0 or bit 1 high causes the Paper Low sensor to be used as a Paper Out sensor.
Panel buttons enable/disable	ESC c 5 + <i>n</i>	1B 63 35 + <i>n</i>	LSB = 0 Paper feed button is enabled. LSB = 1 Paper feed button is disabled. During a macro instruction standby the feed button is always enabled but will not feed paper.
Forward line feed for <i>n</i> character lines	ESC d + <i>n</i>	1B 64 + <i>n</i>	Print if needed then feed paper <i>n</i> character lines. Range = 0 to 255dec. Maximum amount of paper fed = 1016 mm (40"). Can feed past marks in BM mode.
Select Character code table	ESC t + <i>n</i>	1B 74 + <i>n</i>	See section 6.2 - Character Sets
Set/Reset Inverted print	ESC { + <i>n</i>	1B 7B + <i>n</i>	LSB = 1, upside-down printing. LSB = 0, normal printing. This command must be received at the start of a line to be in effect for that line. Does not apply in page mode.
Select	GS ! + <i>n</i>	1D 21 + <i>n</i>	Characters can be printed in sizes from

character size			1 to 8 times normal in either width or height. Bits 0, 1, and 2 set the character width multiplier. Bits 4, 5, and 6 set the character height multiplier. A value of 0 = Normal size. Does not apply to HRI characters when printing bar codes. See ESC !.
Test print	GS (A 02hex 00hex +n +m	1D 28 41 02 00 +n +m	n = 0 or 1 or 2 (00, 01, 02, 30, 31, or 32 hex). m=1 (01 or 31 hex) causes a Hexadecimal dump print pattern.). m=2 (02 or 32 hex) causes a Printer Status print pattern. m=3 (03 or 33 hex) causes a "barber pole" print pattern. Must be received at the start of a line. A cut is performed following the print test. The printer is reset following the print test, even download characters or bit image are erased.
Reverse video	GS B +n	1D 42 +n	Bit 0 = 0 (default) turns off and bit 0 = 1 turns on reverse video printing. Does not apply to bit image, user-defined bit image, bar codes and the HRI part of bar codes, or spaces skipped by HT, ESC \$, or ESC \ commands. Does not affect the space between character lines. Underline does not apply while reverse video is enabled.
Set left margin	GS L +n +m	1D 4C +n +m	Set the left margin to dot position m x 256+n. Must be received at the start of a line. Does not apply in Pase mode. See GS W.
Set print position to the beginning of print line	GS T +n	1G 54 +n	n=0 (either 00 or 30hex) sets the print position to the start of the print line after deleting data in the print buffer. n=1 (either 01 or 31hex) sets the print position to the start of the print line after printing data in the print buffer.
Cut command	GS V m	1D 56 +m +n	If m = 1 (either 01hex or 31hex) a cut is performed and the +n byte must not be sent. If m is a capital B (42hex) then paper is fed for n dot lines and then a cut is performed.
Set Right Margin	GS W +n +m	10 57 +n +m	Sets the print width to m x 256 + n relative to the left margin. Must be received at the start of a line. See GS L.
Print raster bit image	GS v 0 +m +x1 +x2 +y1 +y2 +data	1D 76 30 m x1 x2 y1 y2 data	Error! Reference source not found. OBSOLETE – Use GS (L,<Function 112 + 50> instead

General Usage Print Commands

4.4.2 Status Commands

Because some of the bits in the status responses are fixed, the user can confirm the command to which the status belongs and differentiate the status responses from XON/XOF as shown:

Response to Status Commands	
Response to	Bit Pattern
GS r	0 x x 0 x x x x
XON	0 0 0 1 0 0 0 1
XOF	0 0 0 1 0 0 1 1
DLE EOT	0 x x 1 x x 1 0
ASB (1 st byte)	0 x x 1 x x 0 0
ASB 2 nd -4 th	0 x x 0 x x x x

Response to Status Commands

The transmit buffer is 99 bytes long. If more than 99 bytes are stored up without being transmitted, the status bytes that have no place to be stored will be thrown away.

Status Commands			
Name	Command ASCII	Command +n = data byte[hex]	Description
Real-time STATUS request	DLE EOT +n	10 04 +n	See section 4.4.5
Transmit printer ID	GS I +n	1D 49 +n	See section 4.4.5
Enable/disable Automatic Status Back (ASB)	GS a +n	1D 61 +n	See section 4.4.5

Status Commands

4.4.3 Bar Code Commands

Bar Code Commands			
Name	Command ASCII	Command +n = data byte[hex]	Description
Select print position for HRI characters	GS H n	1D 48 +n	n = 0 (either 00hex or 30hex), no HRI printed. n = 1 (either 01hex or 31hex), HRI printed above the bar code. n = 2 (either 02hex or 32hex), HRI printed below the bar code. n = 3 (either 03hex or 33hex), HRI printed both above and below the bar code. The font used is specified by GS f. Default = 0.
Select font for HRI	GS f +n	1D 66 +n	n = 0 (either 00hex or 30hex), print the HRI using FontA (12x24). n = 1 (either 01hex or 31hex), print the HRI using FontB (9x17). Default = 0.
Set Bar code	GS h +n	1D 68 +n	Set the bar code height in

height			dots. Default = 162. Range = 1 to 255dec.
Print bar code	GS k +n (data+ NUL	1D 6B +n (data) 00	Selects the bar code type and prints. See Section 4.5.8 - Bar Code Command.
Set bar code width	GS w +n	1D 77 +n	n defines the width of lines used for printing bar codes in mm. For codes Code39, ITF, and CODABAR: n=2, 0.250 & 0.625. n=3, 0.375 & 1.000. n=4, 0.500 & 1.250. n=5, 0.625 & 1.625. n=6, 0.750 & 2.000. For codes UPC-A, UPC-E, JAN13, JAN8, Code93, and CODE128; the smaller number listed above = the Modulo Width. Default = 3.

Bar Code Commands

4.4.4 Counter Commands

Counter Commands			
Name	Command ASCII	Command +n = data byte[hex]	Description
Select counter print mode	GS C 0 +n +m	1D 43 30 +n +m	n = 00 hex, prints the actual digits indicated by the number value. n = 01 hex through 05 hex sets the number of digits to be printed. m=0 (either 00 hex or 30 hex), align right with leading spaces. m=1 (either 01 hex or 31 hex), align right with leading zero. m=2 (either 02 hex or 32 hex), align left with trailing spaces. If n = 0 then m has no meaning. Default is n=m=0.
Select count mode (A)	GS C 1 +n1 +n2 +m1 +m2 +n +r	1D 43 32 +n1 +n2 +m1 +m2 +n +r	n1+n2*256 = start count. m1+m2*256 = end count. n = step amount. r = the repetition number when the counter value is fixed. Count up mode is set when n1+n2*256 < m1+m2*256 and n and r are not =0. Count down mode is set when n1+n2*256 > m1+m2*256 and n and r are not =0. Counting stops when n1+n2*256 = m1+m2*256 and n and r are not =0. n = the amount to increment the count by. R = the repetition number when counter value is fixed.
Set counter	GS C 2 +n1 +n2	1D 43 32 +n1 +n2	n1+n2*256 sets the value of the serial number counter. In count-up mode; if the counter value goes outside the counter operation range set by GS C 1 or GS C ;, it is forced to convert to the minimum value set by GS c. In count-down mode; if the counter value goes outside the counter operation range set by GS C

			1 or GS C ;, it is forced to convert to the maximum value set by GS c.
Select count mode (B)	GS C ; s1 ; s2 ; s3 ; s4 ; s5 ;	1D 43 3B s1 3B s2 3B s3 3B s4 3B s5	s1 through s5 are all character strings made up of the ASCII characters 0 through 9. s1 and s2 range from 0 to 65535 and s3 through s5 range from 0 to 255. s1 and s2 specify the counter range. s3 = the amount to increment the count by. S4 = the repetition number when the counter value is fixed. s5 = the counter value. Count-up mode is selected by s1 < s2 and s3 and s4 are not =0. . Count-down mode is selected by s1 > s2 and s3 and s4 are not =0. Counting stops when s1 = s2 or s3 = 0 or s4 = 0.
Print counter	GS c	1D 63	Sets the serial counter value in the print buffer and increments or decrements the counter value based on the count mode selected by GS C 0 and either GS C 1 or GS C ;. In count up mode the counter value is set to the minimum value if it goes out of the range set by GS C 1 or GS C ;. In count down mode the counter value is set to the maximum value if it goes out of the range set by GS C 1 or GS C ;.

Counter Commands

4.4.5 Top of Form Commands

Top of Form Commands			
Name	Command ASCII	Command +n = data byte[hex]	Description
Form feed	FF	0C	Print if needed then feed paper to the next Black Mark if the BM sensor is enabled. See GS (F, GS FF, and DSW1 position 1).
Feed to Black Mark	GS FF	1D 0C	Feed paper to the next Black Mark position. Ignored unless enabled by Dip SW 1 position 1. See GS (F, FF) and Dip Switch settings.

Top of Form Commands

For additional information black mark sensing, see Section 2.2.2 Black Mark Sensors Load.

4.4.6 Page Mode Commands

Bar Code Commands			
Name	Command ASCII	Command +n = data byte[hex]	Description
Form feed	FF	0C	Print and return to standard mode. Printed data is cleared from the data buffer. The printing area set by ESC W is reset to the default setting. See ESC FF, ESC L, and ESC S
CAN	CAN	18	Cancel print data in page mode. See ESC L and ESC W.
Print data in Page mode	ESC FF	1B 0C	Prints all buffered data in the printing area. Printed data is not cleared from the data buffer. ESC T and ESC W values are not cleared. See FF, ESC L, and ESC S.
Set absolute print position	ESC \$ +n +m	1B 24 n m	In Page mode with the starting position (See ESC T) set to the top left corner or the bottom right corner this is a horizontal position but with the starting position set to the top right corner or the bottom left corner this is a vertical position. See ESC \, GS \$, GS \.
Select Page mode	ESC L	1B 4C	Must be received at the start of a line. Settings of ESC SP, ESC 2, ESC 3 have independent values in page mode and standard mode. ESC V, ESC a, ESC {, GS L, and GS W while in page mode makes the settings for standard mode but have no affect while in page mode. The printer returns to standard mode at power on, reset, or ESC @ received. See FF, CAN, ESC FF, ESC S, ESC T, ESC W, GS\$, GS \.

Select standard mode	ESC S	1B 53	Data buffered in page mode is cleared. The printing area set by ESC W is initialized. Settings of ESC SP, ESC 2, ESC 3 are switched to the standard mode values. See FF, ESC FF, ESC L.
Select print direction	ESC T +n	1B 54 +n	Sets the position where data is buffered within the printing area set by ESC W. n=0 (either 00 hex or 30 hex) sets the starting position to the upper left corner and printing goes from left to right. n=1 (either 01 hex or 31 hex) sets the starting position to the lower left corner and printing goes from bottom to top. n=2 (either 02 hex or 32 hex) sets the starting position to the lower right corner and printing goes from right to left. n=3 (either 03 hex or 33 hex) sets the starting position to the upper right corner and printing goes from top to bottom.
In page mode, set printing area	ESC W +x1 +x2 +y1 +y2 +dx1 +dx2 +dy1 +dy2	1B 57 +x1 +x2 +y1 +y2 +dx1 +dx2 +dy1 +dy2	$x1+x2*256$ = horizontal starting position. $y1+y2*256$ = vertical starting position. $dx1+dx2*256$ = printing area width. $dy1+dy2*256$ = printing area height Defaults are $x1=x2=y1=y2=0$, $dx1=128$ for 82.5 mm printer or 64 for 80 mm printer, $dx2=2$, $dy1=152$ for 82.5 mm printer or 226 for 80 mm printer, $dy2=2$.
Set relative print position	ESC \ +n +m	1B 5C +n +m	Set printing position to current position plus $(n+m*256)*0.125$ mm. If the starting position is set (by ESC T) to the upper left or lower right of the printing area then the offset is in the horizontal direction but if the starting position is set to the upper right or lower left of the printing area then the offset is in the vertical direction.
Page mode, Set absolute vertical print position	GS \$ +n +m	1D 24 +n +m	Sets the absolute vertical starting position to buffer character data to $(n+m*256)*0.125$ mm referenced to the starting position defined by ESC T. If the starting position is set (by ESC T) to the upper left or lower right of the printing area then the position is in the vertical direction but if the starting position is set to the upper right or lower left of the printing area then the position is in the horizontal direction.
Page mode, set relative vertical print position	GS \ +n +m	1D 5C +n +m	Set printing position to current position plus $(n+m*256)*0.125$ mm positive (down the page) or $65536-(n+m*256)*0.125$ mm negative (up the page). If the starting position is set (by ESC T) to the upper left or lower right of the printing area then the offset is in the vertical direction

			but if the starting position is set to the upper right or lower left of the printing area then the offset is in the horizontal direction.
Turn smoothing mode on/off	GS b +n	1D 62 +n	LSB = 0 turns smoothing off. LSB = 1 turns smoothing on. Smoothing applies to built-in or user defined characters when printed at any size larger than the normal. See ESC !, GS !.

Page Mode Commands

Here is an example of using page mode:

A typical procedure for transmitting commands in page mode is as follows:

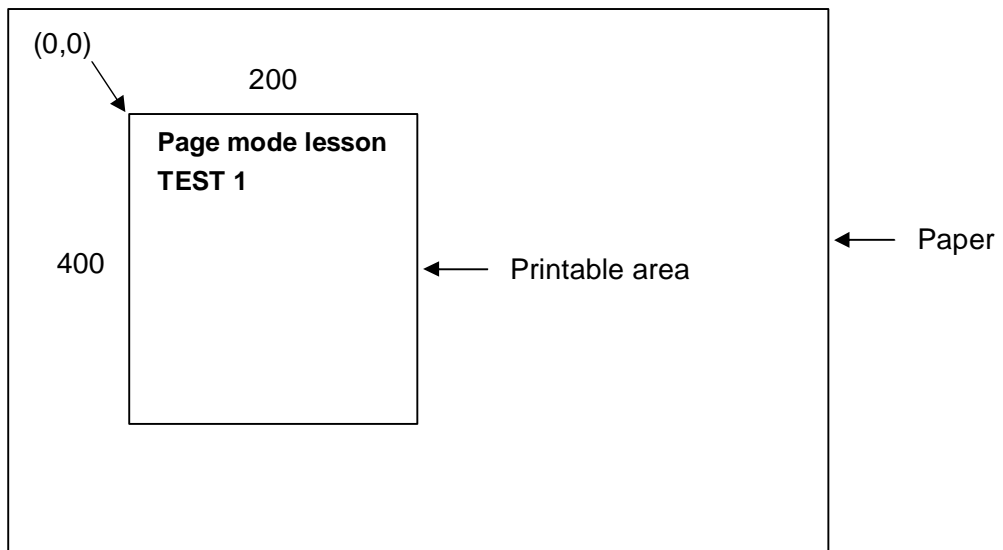
- (1) Transmit **ESC L** to enter page mode.
- (2) Specify the printable area using **ESC W**.
- (3) Specify the printing direction using **ESC T**.
- (4) Transmit the print data.
- (5) Collectively print the data by sending an **FF**.
- (6) After printing, the printer automatically returns to standard mode.

Example: Sample program in BASIC (assumes transmission to the printer is already possible with file #1 open)

```

100 PRINT #1,CHR$(&H1B);"L";
110 PRINT #1,CHR$(&H1B);"W";CHR$(0);CHR$(0);CHR$(0);CHR$(0);
120 PRINT #1,CHR$(200);CHR$(0);CHR$(144);CHR$(1);
130 PRINT #1,CHR$(&H1B);"T";CHR$(0);
140 PRINT #1,"Page mode lesson TEST 1"
150 PRINT #1,CHR$(&HC);
    
```

In the program, a printable area of 200 X 400 dots starting at (0,0) is set, and characters are printed on the first line of the area as shown in the figure below. Note that a line feed was inserted between "lesson" and "TEST 1". This line feed was inserted automatically because there was no room for the blank " " following the word "lesson" within the horizontal range of the 200 · 400 printable area. The feed amount here is that specified by **ESC 3**. Any number of printable areas can be specified before the **FF** is executed. If any printable areas overlap, however, the logical sum of the data written to the overlapping portions is used for the final printing.



4.4.7 NV Memory and Down Load Bit Images Commands

A download bit image is stored in RAM and is cleared by a power cycle or by the commands ESC @ or ESC &. A download bit image (GS *) and user defined characters (ESC &) can not be defined simultaneously, defining either will cancel the other. An NV bit image is stored in non-volatile memory and is cleared only by redefining the NV bit image message. Frequent writes may damage the NV memory. Maximum recommended usage is 10 times per day.

Bar Code Commands			
Name	Command ASCII	Command +n = data byte[hex]	Description
Print NV image	FS p +n +m	1C 70 +n +m	Print the NV message +n defined by FS q in the resolution specified by +m. m = 0 (either 00 hex or 30 hex = 203 by 203 density. m = 1 (either 01 hex or 31 hex = 203 V by 102 H density. m = 2 (either 02 hex or 32hex = 102 V by 203 H density. m = 3 (either 03 hex or 33 hex = 102 V by 102 H density. Must be received when the print buffer is empty. Is not affected by print modes (emphasized, double strike, underline, character size, reverse video. rotated, etc) but is affected by upside-down printing mode. Data which exceeds the allowable print width of the printer is ignored. This command is ignored in Page mode.
Define NV image –	FS q +n +x1 +x2 +y1 +y2 (data) 01 hex through +x1 +x2 +y1 +y2 (data) n hex	1C 71 +n +x1 +x2 +y1 +y2 (data) 01 hex through +x1 +x2 +y1 +y2 (data) n hex	+n (1 through 255) defines the number of NV bit images to be stored in memory. For each NV bit image $(x1+x2*256)*8$ = number of dots being defined in the horizontal direction and $(y1+y2*256)*8$ = number of dots being defined in the vertical direction. Each NV bit image is terminated with a sequential number n. x1 and y1 can range from 0 through 255, x2 can range from 1 through 3, y2 can range from 0 through 1, but $x1+x2*256$ can not be less than 1 or greater than 1023 and $y1+y2*256$ can not be less than 1 or greater than 288. The amount of data needed to complete this command is $(x1+x2*256)*(y1+y2*256)*8$ bytes. Each bit image stored requires an additional 4 bytes for header information. A total of 192 Kbytes is available for storage of all NV bit images. This command clears all previously stored NV bit images so to write a new NV bit image requires

			reloading all NV bit images which are to be stored. When this command is completed, the printer performs a hardware reset so all user-defined characters, downloaded bit images, and macros are cleared and all functions are the same as if power was turned off then back on. In standard mode this command must be received at the start of a line. This command does nothing in page mode.
Define download bit image	GS * +x +y (data)	1D 2A +x +y (data)	+x (1 to 255dec) defines the horizontal size as x times 8 dots. +y (1 to 48dec) defines the vertical size as y times 8 dots. x times y cannot exceed 1536. The download bit image is cleared by a power on reset, ESC @, or ESC &, (a download bit image (GS *) and user defined characters (ESC &) can not be defined simultaneously, defining either will cancel the other).
Print downloaded bit image	GS /+m	1D 2F +m	Print the downloaded bit image defined by GS * in the resolution specified by +m. m = 0 (either 00hex or 30hex = 203 by 203 density. m = 1 (either 01hex or 31hex = 203 V by 102 H density. m = 2 (either 02hex or 32hex = 102 V by 203 H density. m = 3 (either 03hex or 33hex = 102 V by 102 H density. Must be received when the print buffer is empty. Is not affected by print modes (emphasized, double strike, underline, character size, reverse video, rotated, etc) but is affected by upside-down printing mode. If the downloaded bit image exceeds the printable area, the excess data is not printed. If the margins have been set by the GS L and/or GS W commands, this command will readjust the margins as required to print as much of the data as possible for the printer mechanism being used. In Page mode, the terms horizontal and vertical depend on the print starting position defined by ESC T.

NV Memory Commands

4.4.8 Seldom Used Commands

Seldom Used Commands			
Name	Command ASCII	Command +n = data byte[hex]	Description
Set/cancel user-defined character set	ESC % +n	1B 25 n	LSB of n = 0 (default) selects ROM character generator. LSB of n = 1 selects User Defined character generator. See ESC & and ESC ?.
Define User-defined characters	ESC & +y +c1 +c2 (+x +data)	1B 26 03 +c1 +c2 (data)	+y specifies 3 bytes per character in the vertical direction. +c1 specifies the first character to be downloaded and +c2 specifies the last character to be downloaded. +x specifies the number of dots in the horizontal direction. The value of +x is 12dec for FontA or 09dec for FontB). FontA or FontB are selected by ESC ! or ESC M. A download bit image (GS *) and user defined characters (ESC &) can not be defined simultaneously, defining either will cancel the other.
Cancel user-defined characters	ESC ? +n	1B 3F +n	The previous user defined character pattern for character +n (20 hex through 7E hex in either font selected by ESC !) is cleared and the internal character generator is used to print the character n. See ESC & and ESC %.
User-defined commands	GS (E +p1 +p2 +m (data)	1D 28 45 +p1 +p2 +m (data)	p1+p2*256 = the number of data bytes to follow +m plus 1. Function 1 enters the user defined mode. +m=01 hex, p1=03 hex, p2=00 hex, d1=49 hex, d2=4E hex. The printer transmits 37 hex 20 hex, 00 hex. Function 2 ends the user defined mode. +m=02 hex, p1=04 hex, p2=00 hex, d1=4F hex, d2=55 hex, d3=54 hex. The printer performs a software reset, m=2 is only effective in the user defined mode. Function 3 allows setting of the memory switches. +m=03 hex, p1+p2*256 can vary from 10 dec to 65530 dec. The data structure is a 1 followed by b8 through b1. a1 (01 hex through 08 hex) specifies the memory switch to be changed. b8 represents position 8 of that memory switch and so on through b1 represents position 1 of that memory switch then another a followed by b8 through b1 can follow as specified by

			<p>the values of p1 and p2. The values for each b are 30 hex to set a switch OFF, 31 hex to set a switch ON, or 32 hex to leave a switch unchanged. 32 hex should be sent for the "reserved" switches. The switch changes made become effective after a reset or power cycle. Running a self-test printout can check the switch settings. Frequent writes may damage the NV memory. Maximum recommended usage is 10 times per day.</p> <p>Function 4 causes the printer to transmit the settings of a memory switch. +m=04 hex, p1=02 hex, p2=00 hex. The data byte value is from)1 hex through 08 hex to specify which memory switch is being checked. The eleven data bytes transmitted are 37 hex, 21 hex, 8 data bytes representing the 8 switch positions, and 00 hex. The 8 data bytes are transmitted in the order of switch position 8 through switch position 1. For each switch position, the data sent will be 30 hex (an ASCII 0) if the switch is OFF or 31 hex (an ASCII 1) if the switch is ON.</p>
Set adjustment values	GS (F +p1 +p2 +a +m +n1 +n2	1D 28 46 04 00 +a +m +n1 +n2	<p>Effective only when the BM sensor is enabled. +a = 01 hex selects the function for the position to start printing when used by FF or GS FF commands. +a = 02 hex selects the function for the position to start cutting when used by the GS V command. +m = 0 (either 00 hex or 30 hex) specifies a forward paper feed. +m = 1 (either 01 hex or 31 hex) specifies a reverse paper feed. (n1+n2*256)*0.125 mm specifies how much to feed. The default of all adjustment values is 0.</p>
Save or load adjustment values in NV memory	GS (M +p1 +p2 +n +m	1D 28 4D +p1 +p2 +n +m	<p>Function 1 saves the settings made by GS (F in NV memory. +n = 1 (either 01 hex or 31 hex), +m = 1 (either 01 hex or 31 hex), +p1=02 hex, +p2=00 hex.</p> <p>Function 2. +n = 2 (either 02 hex or 32 hex), +m = 0 (either 00 hex or 30 hex), setting made by GS (F is set as the default value or +m = any value except either 00 hex or 30 hex, setting values are stored in area m of memory, +p1=02 hex, +p2=00 hex. Must be processed at the beginning of a line. No effect in page mode.</p> <p>Function 3 set whether or not the value saved in NV memory is the</p>

			<p>default to be used at power on. +n = 3 (either 03 hex or 33 hex). +m = 0 (either 00 hex or 30 hex), the printer does not load the value from NV memory at initialization. +m = any value except either 00 hex or 30 hex, the printer loads the value from NV memory at initialization. Frequent writes may damage the NV memory. Maximum recommended usage is 10 times per day.</p>
Start/end macro definition	GS :	1D 3A	<p>Macro definition starts when this command is received during normal operation and ends when this command is received during macro definition. ESC @ does not clear the contents of the macro definition so ESC @ can be included in the macro definition. The contents of the macro can not exceed 2048 bytes.</p>
Select head control method	GS E +n	1D 45 +n	<p>+n=00 hex, Print speed 1 (150 mm/second). +n=10 hex, Print speed 2 (100 mm/second). +n=20 hex, Print speed 3 (80 mm/second). +n=30 hex, Print speed 4 (50 mm/second). When Memory switch 8 position 1 is set to divided energy, the maximum speed is 120 mm/second. Default is speed 1.</p>
Execute macro	GS ^ +n +m +o	1D 5E +n +m +o	<p>+n (0 through 255) specifies the number of times to execute the macro. +m (0 through 255) specifies how long to wait between executions of the macro (m*100 milliseconds) When the LSB on +o is 0, the macro executes n times at the interval of m*100 msec. When the LSB on +o is 1, the macro executes then after an interval of m*100 msec the Paper Out LED flashes and the printer waits for the Paper Feed button to be pressed as a signal to execute the next sequence until the macro has executed +n times</p>

Seldom Used Commands

4.5 Descriptions of Commands

4.5.1 Set Print Mode

ESC ! +n [1B 21 +n]

+n is defined as:

Print Mode Settings	
Bit 7	0 = Underline OFF 1 = Underline ON.
Bit 6	Not used.
Bit 5	0 = Double wide print OFF. 1 = Double wide print ON.
Bit 4	0 = Double high print OFF. 1 = Double high print ON.
Bit 3	0 = Emphasized print OFF. 1 = Emphasized print ON.
Bit 2	Not used.
Bit 1	Not used.
Bit 0	0 = FontA (12x24). 1 = FontB (9x17).

Print Mode Settings

Both double wide and double high can be selected for any of the type faces. When a printed line contains characters with different heights, the characters are arranged so that bottoms of all characters line up. All characters printed can be underlined except 90 degree-rotated characters. The space caused by the tab command HT is not underlined. The thickness of the underline is defined by ESC – regardless of the character size. Default = 0hex (12 x 24 matrix)..

4.5.2 Set Bit Image Mode

ESC +m +n1 +n2 +d1~dn [1B 2A +m +n1 +n2 (data)]

Specifies and prints bit image graphics.

Set Bit Image Mode				
+m	Mode	Vertical dot density	Horizontal dot density	Number of data bytes
00 hex	8 Single density	67.7 dpi	101.6 dpi	n1+n2*256
01 hex	8 Double density	67.7 dpi	203.2 dpi	n1*n2*256
20 hex	24 Single density	203.2 dpi	101.6 dpi	(n1+n2*256)*3
21 hex	24 Double density	203.2 dpi	203.2 dpi	(n1+n2*256)

Set Bit Image Mode

If +m is not one of the specified values, the rest of the ESC sequence is ignored and all information starting with +n1 is treated as normal data.

In single density mode (+m=00 or 20), for each bit of data received the printer prints two dots horizontally so the horizontal resolution is 101.6 dpi.

In double density mode (+m=01 or 21), for each bit of data received the printer prints one dot horizontally so the horizontal resolution is 203.2 dpi.

In 8 dot mode (+m=00 or 01), for each data bit received the printer prints three dots vertically so the vertical resolution is 67.7 dpi.

In 24 dot mode (+m=20 or 21), for each data bit received the printer prints one dot vertically so the vertical resolution is 203.2 dpi.

+n1 and +n2 define the number of dots per line to be printed in the horizontal direction. +n1 and +n2 cannot both have a value of 0. The range of +n1 = 0 to 255 dec and the range of +n2 is 0 to 3 dec so a total number of horizontal dot position which can be printed with one ESC sequence can vary from 1 to 1023.. If +n1 or +n2 is outside this range, the ESC sequence is ignored and all data following is treated as normal data.

If the bit image data specified is more than what will fit on a line, the excess data is ignored.

If the width of the printing area set by GS L and GS W is less than the width required by the data sent with the ESC * command, the margins are re-adjusted to print as much of the graphics data as possible. The right margin is extended first and then if the data still will not fit then the left margin is readjusted up to the point where the full width of the print head is used for printing the graphics image.

When 8 dot bit image is selected, each byte of data represents 8 vertical dots to be printed. The MSB is the top dot to be printed and the LSB is the bottom dot to be printed. For each of the 8 bits within each data byte, a "1" represents a dot position to be printed and a "0" represents a dot position not to be printed.

When 24 dot bit image is selected, each series of three bytes of data represent 24 vertical dots to be printed. The first byte represents the top 8 dots to be printed, the second byte represents the 8 dots to be printed in the middle, and the third byte represents the bottom 8 dots to be printed. The MSB of each byte is the top dot to be printed and the LSB is the bottom dot to be printed. For each of the 24 bits within each series of three data bytes, a "1" represents a dot position to be printed and a "0" represents a dot position not to be printed.

After printing a bit image, the printer returns to normal mode. The graphics mode is not affected by print modes (emphasized, double-strike, underline, character size, or reverse video) but is affected by the inverted print mode.

4.5.3 Set Raster Bit Image Mode

NOTE: Commands **GS v 0**, **FS p** and **FS q** pertaining to raster graphics are now defined as **obsolete commands** in the ESC/POS command system. This printer supports both upward-compatible commands and obsolete commands. However, the upward-compatible commands are recommended to use because the obsolete commands will not be supported in future products. Please use the supported **GS (L** and **GS 8 L** commands instead to perform graphics instead (described in **Section 4.4.4**).

GS v 0 +m +x1 +x2 +y1 +y2 +d1-dk [1D 76 30 +m +x1 +x2 +y1 +y2 (data)]

Specifies and prints RASTER bit image graphics.

Set Raster Bit Image Mode			
+m	Mode	Vertical dot density	Horizontal dot density
0 (00 or 30 hex)	Normal	203.2 dpi	203.2 dpi
1 (01 or 31 hex)	Double Wide	203.2 dpi	101.6 dpi
2 (01 or 32 hex)	Double high	101.6 dpi	203.2 dpi
3 (03 or 33 hex)	Quadruple	203.2 dpi	203.2 dpi

Table 2 Set Raster Bit Image Mode

The number of data bytes which must be sent to complete this command = $(x1+x2*256)*(y1+y2*256)$.

If +m is not one of the specified values, the rest of the ESC sequence is ignored and all information starting with +n1 is treated as normal data.

The values of x1 and x2 select the number of data bytes $(x1+x2*256)$ in the horizontal direction. The value of x1 can be from 1 to 128 and the value of x2 must be 00hex so the maximum number of dots which can be specified is 1024 (128 bytes times 8 bits per byte). Any data specified and received which exceeds the printing width of the printer is read in and then discarded.

In standard mode, this command is effective only when there is no data in the print buffer. The starting point of the printed image can be set by the HT (Horizontal Tab), ESC \$ (Set absolute print position), ESC \ (Set relative print position), or GS L (Set left margin) command if that position is a multiple of 8.

This command is not affected by print modes (character size, emphasized print, double strike, inverted print, underline, reverse video, etc.). ESC a (Select justification) is effective on raster bit images. If the width of the printing area set by GS L and GS W is less than the minimum width, the printing area is extended to the minimum width only on the line in question. This minimum width is 1 dot in normal or double high mode and is 2 in double wide or quadruple mode.

Each data byte represents 8 horizontal dots to be printed with the MSB being to the left and the LSB being to the right. . For each of the 8 bits

within each data byte, a “1” represents a dot position to be printed and a “0” represents a dot position not to be printed. The first $x1+x2*256$ data bytes are printed as the first raster line. The next $x1+x2*256$ data bytes are printed as the second raster line. This sequence continues until all $y1+y2*256$ dot lines defined have been printed. After printing the raster bit image, the printer returns to normal mode.

4.5.4 Set and Process Graphics Data

GS (L pL pH m fn [parameter]

1D 28 4C pL pH m fn [parameters]

GS 8 L p1 p2 p3 p4 m fn [parameter]

1D 38 4C p1 p2 p3 p4 m fn [parameters]

In the description below, only the **GS (L** command is used for explanation. Please note that **GS (L** and **GS 8 L** have the same function, however, if the [parameters] in the Format column in the table below exceed 65,533 bytes, then the **GS 8 L** command must be used.

Command	Parameters	Structure	Maximum Value
GS (L	pL, pH	2 bytes	65,535
GS 8 L	P1, p2, p3, p4	4 bytes	4,294,967,295

Definitions:

- **pL** and **pH** specify (pL + pH X 256) as the number of bytes after pH (m, fn, and [parameters])
- **fn** specifies the function
- **[parameters]** specify the process of each function

fn	Format	Function No.	Function Name
0, 48	GS (L pL pH m fn	48	Transmit the NV graphics memory capacity
2, 50	GS (L pL pH m fn	50	Print graphics data in the print buffer
3, 51	GS (L pL pH m fn	51	Transmit the remaining capacity of the NV graphics memory
64	GS (L pL pH m fn d1 d2	64	Transmit the key code list for defined NV graphics
65	GS (L pL pH m fn d1 d2 d3	65	Delete all NV graphics data
66	GS (L pL pH m fn kc1 kc2	66	Delete the specified NV graphics data
67	GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1...dk]1...[c d1...dk]b	67	Define the NV graphics data (raster format)
69	GS (L pL pH m fn kc1 kc2 x y	69	Print the specified NV graphics data
112	GS (L pL pH m fn a bx by c xL xH yL yH d1...dk	112	Store the graphics data in the print buffer (raster format)

Notes pertaining to GS (L and GS 8 L:

- Frequent write command executions by an NV memory write command may damage the NV memory. Therefore, it is recommended to limit writing of the commands into the NV memory to 10 times or less a day.
- If the power is turned off or the printer is reset via an interface while this command is being executed, the printer may go into an abnormal condition. Be careful not to turn the power off or let the printer be reset via an interface while this command is being executed.
- While processing this command, the printer is BUSY while writing the data to the NV memory and stops receiving data. Therefore, be sure not to transmit data from the host PC while the printer is BUSY.

When <Function 48, 51, or 64> is transmitted, do not transmit the subsequent data until the status is received. ESC/POS Handshaking Protocol procedures is required when using <Function 64>.

<Function 48> GS (L pL pH m fn (fn = 0, 48)

1D 28 4C pL pH m fn

Description: Transmits the entire capacity of the NV graphics area (number of bytes in the NV graphics area).

Range:

- $(pL + pH \times 256) = 2$ (pL = 2, pH = 0)
- m = 48
- fn = 0, 48

<Function 50> GS (L pL pH m fn (fn = 2, 50)

1D 28 4C pL pH m fn

Description: Prints the graphics data stored in the print buffer (by using GS (L<Function 112>)

Range:

- $(pL + pH \times 256) = 2$ (pL = 2, pH = 0)
- m = 48
- fn = 2, 50

<Function 51> GS (L pL pH m fn (fn = 3, 51)

1D 28 4C pL pH m fn

Description: Transmit the number of bytes of remaining memory (unused area) in the NV graphics area.

Range:

- $(pL + pH \times 256) = 2$ (pL = 2, pH = 0)
- m = 48
- fn = 3, 51

<Function 64> GS (L pL pH m fn d1 d2 (fn = 64)

1D 28 4C pL pH m fn d1 d2

Description: Transmits the key code list for defined NV graphics.

Range:

- $(pL + pH \times 256) = 2$ (pL = 4, pH = 0)
- m = 48
- fn = 64
- d1 = 75
- d2 = 67

<Function 65> GS (L pL pH m fn d1 d2 d3 (fn = 65)

1D 28 4C pL pH m fn d1 d2 d3

Description: Deletes all NV graphics data.

Range:

- $(pL + pH \times 256) = 2$ ($pL = 5, pH = 0$)
- $m = 48$
- $fn = 65$
- $d1 = 67$
- $d2 = 76$
- $d3 = 82$

<Function 66> GS (L pL pH m fn kc1 kc2 (fn = 66)

1D 28 4C pL pH m fn kc1 kc2

Description: Deletes the NV graphics data defined by key codes (kc1 and kc2).

Range:

- $(pL + pH \times 256) = 2$ ($pL = 4, pH = 0$)
- $m = 48$
- $fn = 66$
- $32 \leq kc1 \leq 126$
- $32 \leq kc2 \leq 126$

<Function 67> GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1...dk]1...[c d1...dk]b (fn = 67)

1D 28 4C pL pH m fn kc1 kc2

Description: Defines the NV graphics data (raster format) as a record specified by the key codes (kc1, kc2) in the NV graphics area.

- **b** specifies the number of the color of the defined data.
- **xL, xH** specify the number of dots in the horizontal direction as $(xL + xH \times 256)$.
- **yL, yH** specify the number of dots in the vertical direction as $(yL + yH \times 256)$.
- **c** specifies the color of the defined data ($color1 = 49$).
- **d** specifies the defined data (raster format).

Range:

- For **GS (L:** $12 \leq (pL + pH \times 256) \leq 65535$; ($0 \leq pL \leq 255, 0 \leq pH \leq 255$)
- For **GS 8 L:** $12 \leq (p1 + p2 \times 256 + p3 \times 65,536 + p4 \times 16,777,216) \leq 4,294,967,295$ ($0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255$)
- $m = 48$
- $fn = 67$
- $a = 48$
- $32 \leq kc1 \leq 126$
- $32 \leq kc2 \leq 126$
- $b = 1$
- $1 \leq (xL + xH \times 256) \leq 8192$ ($0 \leq xL \leq 255, 0 \leq xH \leq 32$)
- $1 \leq (yL + yH \times 256) \leq 2304$ ($0 \leq yL \leq 255, 0 \leq yH \leq 9$)
- $c = 49$
- $0 \leq d \leq 255$
- $k = (\text{int}((xL + xH \times 256) + 7)/8) \times (yL + yH \times 256)$; Maximum capacity size = 256KB.

NOTES regarding <Function 67>:

- In cases where there is sufficient capacity is not available for storing NV graphics data specified by $(xL + xH \cdot 256)$ and $(yL + yH \cdot 256)$, this function is ignored.
- The number of items of NV graphics registered should be within 50 to shorten the execution time of this function. The execution time is 60 seconds or less when the number of items registered is within 50. The execution time for 100 items is 120 seconds or less.
- The [data value (k) + control information data value (24 bytes)] area of the NV graphics data domain is used when this function is executed.
- NV graphics and NV bit image (**FS q**) cannot be defined simultaneously. When this function is executed, all NV bit images are deleted.

<Function 69> GS (L pL pH m fn kc1 kc2 x y (fn = 69))

1D 28 4C pL pH m fn kc1 kc2 x y

Description: Prints the NV graphics data defined by key codes (kc1 and kc2).

Range:

- $(pL + pH \times 256) = 6$ (pL = 6, pH = 0)
- m = 48
- fn = 69
- $32 \leq kc1 \leq 126$
- $32 \leq kc2 \leq 126$
- x = 1, 2
- y = 1, 2

x, y	Vertical direction	Horizontal direction
1	203 dpi	203 dpi
2	101 dpi	101 dpi

<Function 112> GS (L pL pH m fn a bx by c xL xH yL yH d1...dk (fn = 112))

1D 28 4C pL pH m fn a bx by c xL xH yL yH d1...dk

Description: Stores the graphics data (raster format) in the print buffer.

- **b** specifies the number of the color of the defined data.
- xL, xH specify the number of dots in the horizontal direction as $(xL + xH \times 256)$.
- yL, yH specify the number of dots in the vertical direction as $(yL + yH \times 256)$.
- **c** specifies the color of the defined data (color1 = 49).
- **d** specifies the defined data (raster format).

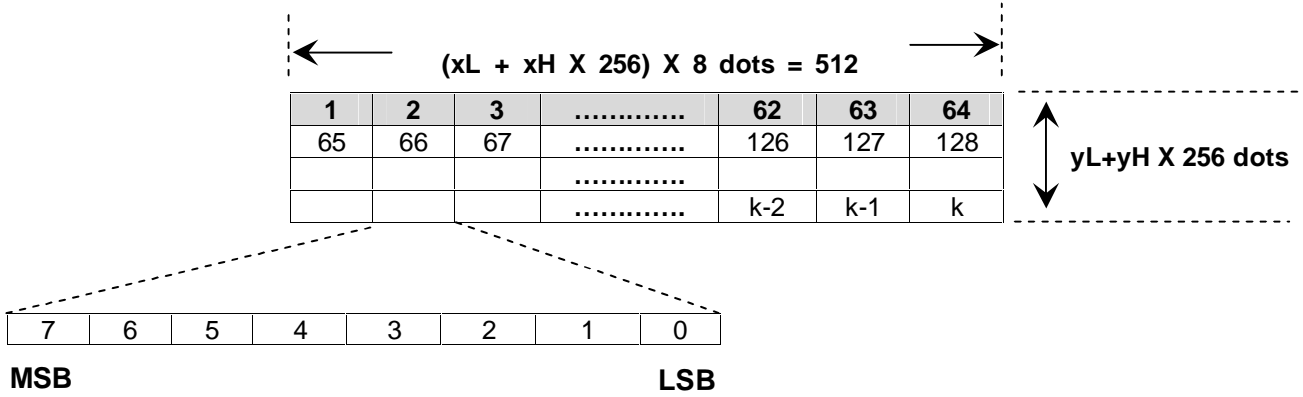
Range:

- For **GS (L)**: $11 \leq (pL + pH \times 256) \leq 65535$; $(0 \leq pL \leq 255, 0 \leq pH \leq 255)$
- For **GS 8 L**: $11 \leq (p1 + p2 \times 256 + p3 \times 65,536 + p4 \times 16,777,216) \leq 4,294,967,295$ $(0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255)$
- m = 48
- fn = 112
- a = 48
- bx = 1, 2 (enlarges graphics data in the horizontal direction; 1 = 203dpi, 2 = 101 dpi)
- by = 1, 2 (enlarges graphics data in the vertical direction; 1 = 203dpi, 2 = 101 dpi)
- c = 49
- $1 \leq (xL + xH \times 256) \leq 2047$ $(0 \leq xL \leq -255, 0 \leq xH \leq 7)$
- $1 \leq (yL + yH \times 256) \leq 1662$ $(0 \leq yL \leq -255, 0 \leq yH \leq 6)$ [when by = 1]
- $1 \leq (yL + yH \times 256) \leq 831$ $(0 \leq yL \leq -255, 0 \leq yH \leq 3)$ [when by = 2]

- $0 \leq d \leq 255$
- $k = (\text{int}((xL + xH \times 256) + 7)/8) \times (yL + yH \times 256)$.
- xL, xH specify the number of dots in the horizontal direction as $(xL + xH \times 256)$.
- yL, yH specify the number of dots in the vertical direction as $(yL + yH \times 256)$.

EXAMPLE:

$xL + xH \times 256 = 64$



4.5.6 Enable/Disable Auto Status Back (ASB) mode

Causes the printer to transmit four status bytes on the XD line when this command is processed out of the receive buffer and also sets the conditions which will cause the printer to automatically transmit the status bytes. If all conditions are disabled then the ASB function is also disabled. The status bytes are transmitted without checking to see if the host is ready to receive the data.

+n is defined as:

Enable/Disable Auto Status Back (ASB) mode	
Bit	Function
Bit 7	Not used.
Bit 6	Not used.
Bit 5	Not used.
Bit 4	Not used.
Bit 3	1 = enable ASB for paper out status
Bit 2	1 = enable ASB for an error condition
Bit 1	1 = enable ASB for Online/Offline.
Bit 0	Not used – set to 0.

Enable/Disable Auto Status Back (ASB) mode

See section 0 - .

Status Bytes Transmitted.

4.5.7 Status Bytes Transmitted

First Status Byte Transmitted		
	The first byte sent due to ASB status= printer information:	Status byte sent when DLE EOT 01hex is received
Bit 7	Not used – always OFF	Not used – always OFF.
Bit 6	1 = PAPER FEED button.	Not used
Bit 5	1 = Platen is open.	Not used.
Bit 4	Not used – always ON.	Not used – always ON.
Bit 3	1=OFF LINE, 0 = ON LINE.	1 = off-line, 0 = on-line.
Bit 2	Not used - always ON.	Not used – always ON.
Bit 1	Not used - always OFF	Not used – always ON
Bit 0	Not used - always OFF.	Not used – always OFF

First Status Byte Transmitted

Second Status Byte Transmitted		
	The second byte sent due to ASB status = printer information:	Status byte sent when DLE EOT 02 hex is received
Bit 7	Not used - always OFF	Not used – always OFF
Bit 6	1 = An automatically recoverable error has occurred (Print head temperature or Platen open).	1 = an error occurred, 0 = no errors.
Bit 5	1 = An unrecoverable error has occurred.	1 = Printing is halted, 0 = not out of paper.
Bit 4	Not used - always OFF.	Not used – always ON.
Bit 3	1 = CUTTER error.	1 = paper is being fed by the paper feed button.
Bit 2	Not used	
Bit 1	Not used.	1 = Platen is open.
Bit 0	Not used.	Not used – always ON.

Second Status Byte Transmitted

Third Status Byte Transmitted		
	The third byte sent due to ASB status = paper sensor information:	Status byte sent when DLE EOT 03 hex is received
Bit 7	Not used - always OFF	Not used – always OFF
Bit 6	Not used.	1 = an auto recoverable error has occurred (print head temperature or platen open).
Bit 5	Not used.	1 = an un recoverable error has occurred.
Bit 4	Not used - always OFF.	Not used – always ON.
Bit 3	1 = PAPER OUT	1 = a cutter error has occurred.
Bit 2	1 = PAPER OUT	1 = a mechanical error has occurred.
Bit 1	1 = PAPER LOW.	Not used – always ON.
Bit 0	1 = PAPER LOW	Not used – always OFF

Third Status Byte Transmitted

Fourth Status Byte Transmitted		
	The fourth byte sent due to ASB status = paper sensor information:	Status byte sent when DLE EOT 04 hex is received
Bit 7	Not used – always OFF	Not used – always OFF
Bit 6	Not used.	Bits 6 & 5 both 1 = paper out.
Bit 5	Not used.	Bits 6 & 5 both 1 = paper out.
Bit 4	Not used – always OFF	Not used – always ON.
Bit 3	Not used	Bits 3 & 2 both 1 = Paper low.
Bit 2	Not used.	Bits 3 & 2 both 1 = Paper low.
Bit 1	1 = MEMORY switch 1-3 is ON	Not used – always ON.
Bit 0	Not used.	Not used – always OFF

Fourth Status Byte Transmitted

4.5.8 Bar Code Command

GS k +m +d1~dn NUL [1D 6B +m (DATA) 00]

For +m = 00hex through 06hex, +m selects the bar code type

Bar Code Commands			
+m	Bar Code	No. of data bytes	Valid data (ASCII)
00 hex	UPC-A	11 or 12	0 - 9
01 hex	UPC-E	11 or 12	0 - 9
02 hex	JAN(EAN)13	12 or 13	0 - 9
03 hex	JAN(EAN)8	7 or 8	0 - 9
04 hex	CODE39	variable	0 - 9, A-Z, space, \$ % + - . /
05 hex	I 2 of 5	even number	0 - 9
06 hex	CODABAR	variable	0 - 9, A,B,C,D, \$ + - . / :

Bar Code Commands

Notes:

1. For UPC-A or UPC-E, Printing starts after 12 data bytes are received.
2. For JAN13 (EAN13), Printing starts after 13 data bytes are received.
3. For JAN8 (EAN8), Printing starts after 8 data bytes are received.
4. For ITF, the number of data bytes must be an even number.

4.5.9 GS k +m +n +d1~dn [1D 6B +m +n (DATA)]

For +m = 41hex through 49hex, +m selects the bar code type, +n = number of data bytes to follow.

Bar Code Command Values			
+m	Bar Code	+n(dec) =	Valid data
41 hex	UPC-A	11 or 12	0 - 9
42 hex	UPC-E	11 or 12	0 - 9
43 hex	JAN(EAN)13	12 or 13	0 - 9
44 hex	JAN(EAN)8	7 or 8	0 - 9
45 hex	CODE39	1 thru 255	0 - 9, A-Z, space, \$ % + - . /
46hex	I 2 of 5	even 1 thru 255	0 - 9
47hex	CODABAR	1 thru 255	0 - 9, A,B,C,D, \$ + - . / :
48hex	Code93	1 thru 255	00hex thru 7Fhex
49hex	Code128	2 thru 255	00hex thru 7Fhex

Bar Code Command Values

Notes:

1. +n indicates the number of data bytes which follow.
2. If +n is outside the allowable range, the command aborts and following data is treated as normal data.

Notes when CODE93 (+m=48hex) is used:

1. In the HRI fields, a small square is printed as the start character and as the stop character before and after the HRI character string.
2. In the HRI field, a small solid block followed by alphabetic character is printed when a control code is printed. The character printed after the block for each control code is (nn in hex,alphe character): 00,U 01,A 02,B 03,C 04,D 05,E 06,F 07,G 08,H 09,I 0A,J 0B,K 0C,L 0D,M 0E,N 0F,O 10,P 11,Q 12,R 13,S 14,T 15,U 16,V 17,W 18,X 19,Y 1A,Z 1B,A 1C,B 1D,C 1E,D 1F,E 7F,T..

Notes when CODE128 (+m=49 hex) is used:

1. The first character of the bar code data string must be the code set selection character (CodeA, CodeB, or CodeC) which selects the first code set to use. Code setcharacters are specified by sending a two character sequence, the first character is { (7B hex) and the second is a printable ASCII character. CodeA = {A, CodeB = {B, CodeC = {C.
 - a. Code set A consists of the ASCII characters 00 hex through 5F hex, FNC1 through FNC4, SHIFT, CodeB, and CodeC.
 - b. Code set B consists of the ASCII characters 20 hex through 7F hex, FNC1 through FNC4, SHIFT, CodeA, and CodeC.
 - c. Code set C consists of 2-digit numeral characters using one character (100 numerals from 00 dec through 99 dec or 00 hex through 63 hex), FNC1, CodeA, and CodeB.
2. Special characters are specified by sending a two character sequence, the first character is { (7B hex) and the second is a printable ASCII character.

The special characters are SHIFT and the FUNCTION characters. SHIFT = {S, FNC1 = {1, FNC2 = {2, FNC3 = {3, and FNC4 = {4. To specify the character { send {{. The usage of FUNCTION characters depends on the application program.

3. In code set A the character just after SHIFT is processed as a character for code set B. In code set the character just after SHIFT is processed as a character for code set C. In code set C the SHIFT is invalid.
4. HRI characters are not printed for the SHIFT characters or CODE SET selection characters.
5. HRI for a Function character is a space.
6. HRI for a control code (00hex through 1Fhex, and 7Fhex) is a space.
7. Errors in the data cause the bar code processing to abort, data following is treated as normal data.
 - a. The top of the data field is not a code set selection character.
 - b. If a sequence {+n is invalid.
 - c. Characters that can not be used in special code set.

Notes in standard Mode:

1. If any invalid data is received, the printer only feeds paper and the following data is treated as normal data.
2. If the horizontal size exceeds the printing area, the printer only feeds paper.
3. This command only feeds enough paper to print the bar code regardless of ESC 2 and ESC 3 settings.
4. This command is valid only when there is no data in the print buffer. When there is data in the print buffer, the data following +m is treated as normal data.
5. This command is not affected by print modes (emphasized, double-strike, underline, character size, reverse video, or rotated print) but is affected by the inverted print mode.

Notes in Page mode:

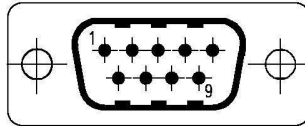
1. This command develops the bar code data in the print buffer. The print position moves to the right side dot of the bar code.
2. If any invalid data is received, the printer stops command processing and the following data is treated as normal data. The data buffer position does not change.
3. If the bar code width exceeds the printing area, the bar code is not printed but the data buffer position moves to the left side of the printing area.

4.6 Serial (RS232C) Interface

4.6.1 Serial (RS232C) Interface Specification

Serial (RS232C) Interface Specification	
Item	Specification
Data receive speed	115200, 38400, 19200, 9600, 4800 bps (set by DIP switch)
Synchronizing method	Asynchronous, Full duplex
Hand shake	CTS/RTS ,DTR/DSR signal or XON/XOFF (set by DIP switch)
Input output level	RS232C
Signal level	Space (logic=0) +3 V ~ +15 V Mark (logic=1) -3 V ~ -15 V
Data Bit Length	8 Data bits (fixed)
Stop Bits	Fixed to 1 on the printer side
Parity Setting	Odd, Even, or None (set by DIP switch)
Connector on Printer	Male D-Sub 9 Pin (See Connector pin-out below)

4.6.2 **Serial I/O Connector on the Serial (RS-232) Printer Option (see diagram below) shows the connector pin-out of the male D-Sub connector located on the printer.**



Serial (RS232C) Interface Pin Assignments			
Pin	Name	Direction	Function
2	RD	I	RS232 received data.
3	XD	O	RS232 transmitted data.
4	DTR	O	Hardware handshake line.
5	GND	-	Logic ground.
6	DSR	I	High ("space") = OK for the printer to transmit data when requested. The state of DSR is IGNORED for XON/XOF handshaking if selected. Dip Switch SW2 position 7 ON reconnects this signal to be a hardware RESET input signal (normal connection to the DTR line from a computer will hold the printer always reset).
7	RTS	O	Same as DTR.

Printer Side		Signal Path (for a cable)	Host Side	
Printer Pin# on D-Sub Connector	Signal Name		Signal Name	Pin-out specifically for a Computer 9-Pin D-Sub Connector
1	(NC)		DCD	1
2	RxD	←	RxD	2
3	TxD	→	TxD	3
4	DTR	←	DTR	4
5	Ground	→	Ground	5
6	DSR	←	DSR	6
7	RTS	→	RTS	7
8	CTS	←	CTS	8
9	(NC)		RI	9

4.6.3 Flow Control

MEMORY switch 1 position 3 ON sets the BUSY condition when the receive buffer is full. OFF sets the BUSY condition when the receive buffer is full or when Off Line.

The MTP-1530II employs a 4 K byte data buffer to allow the host computer to rapidly transfer data. Under some circumstances it may be possible to completely fill the buffer. When the Receive Buffer is within 128 bytes of being full, the MTP-1530II signals the host computer to pause until the receive buffer has room 256 bytes. The flow control information is sent to the host using hardware or software protocols as determined by the DIP switch settings.

The hardware protocol uses the DTR line of the serial interface. This pin are asserted or negated as necessary to turn off and turn on the flow of data. The software protocol uses the XON (11hex) and XOFF (13hex) ASCII control codes which are sent back to the host to start and stop the data stream. When XON/XOF handshaking is enabled, the XON and XOF are transmitted without checking the state of the DSR line of the I/O connector. Some host systems may not support one or both of these protocols.

If memory switch 1 position 3 is set to OFF and DTR handshaking is enabled, then the DTR line goes to the BUSY state whenever the printer is OFF LINE (see section 1.1.3 add bookmark) or when the receive buffer is full. If memory switch 1 position 3 is set to ON and DTR handshaking is enabled, then the DTR line goes to the BUSY state from the time power is turned on until the printer is ready to receive data,

during self test, or when the receive buffer is full. If XON/XOF is enabled then the DTR line goes to the BUSY state from the time power is turned on until the printer is ready to receive data or during self test.

If XON/XOF handshaking is enabled the printer sends XON when the printer goes On Line after a power on, when the receive buffer becomes available following a buffer full condition, when the printer switches from Off Line to On Line, or when the printer recovers from an error using DLE ENQ 1 or DLE ENQ 2. The printer sends XOF when the receive buffer becomes full or when the printer switches from On Line to Off Line.

4.7 Centronics Parallel (IEEE-1284) Interface

4.7.1 Parallel I/O Connector



Parallel Interface Pin Assignments				
Pin	Name	Nibble & Byte mode	Direction	Function
1	/STB	HostClk	I	Active Low Pulse to send data to printer
2	DO	DO	I/O	ASCII data bit 0 (LCB)
3	D1	D1	I/O	ASCII data bit 1
4	D2	D2	I/O	ASCII data bit 2
5	D3	D3	I/O	ASCII data bit 3
6	D4	D4	I/O	ASCII data bit 4
7	D5	D5	I/O	ASCII data bit 5
8	D6	D6	I/O	ASCII data bit 6
9	D7	D7	I/O	ASCII data bit 7
10	/ACK	PtrClk	O	Active low pulse when data is accepted
11	BUSY	PtrBusy	O	High level when printer cannot accept data.
12	PE	AckDataReq	O	High level when printer is out of paper
13	SLCT	Xflag	O	
14	/AFXT	HostBusy	I	.
15	n/c	ND	-	
16	GND	GND	I	Logic ground.
17	Fgnd	FG	-	.
18	Logic-H	Logic-H	O	
19 thru 30	GND	GND	-	Logic ground.
31	/INIT	/INIT	I	
32	/ERROR	/DataAvail	O	
33	GND	ND	-	
34	DKSTAT	ND	O	
35	+5V	ND	O	
36	/SLCTIN	1284-Active	I	

4.8 USB 2.0 Interface

General specifications:

- § Complies with USB 2.0.
- § Transmission speed: USB Full-speed mode (12 Mbps).
- § Communication method: USB bulk transfer
- § Power: USB self-powered function device
- § USB bus current consumption: 0 mA (All power is supplied from the BA-T500II.)
- § HUB: None
- § USB packet size: (in full-speed connection)
- § USB bulk OUT (TM) 64 bytes
- § USB bulk IN (TM) 64 bytes USB device class
- § USB device class: USB vendor-defined class and USB printer class

The setting value of DIP switch 1-7 specifies the class at power-on.

USB Descriptor Table:

	USB Vendor-defined class	USB printer class
Vendor ID	04B8h	04B8h
Product ID	0202h	0E02h
String Descriptor		
Manufacturer	EPSON	EPSON
Product	BA-T500II	BA-T500II
Serial Number	Character string based on the product serial number.	Character string based on the product serial number

4.8 Ethernet Interface

General Features:

10BASE-T and 100BASE-TX Ethernet communication, full/half duplex
(Auto-negotiation or manual setting)

- Complies with TCP/IP protocol (LP, LPR and socket communications)
- IP address setting with arp + ping
- Support to DHCP
- Support to APIPA
- Ping response
- Status printing function
- Setting initialization of this module with a push button
- Status monitoring with ENPC
- Status monitoring with SNMP

Circuit Board Push Button:

Setting Factory Defaults: Holding down the push button while turning on the printer power and continuing to hold it on for five seconds or more causes all of the internal setting parameters to return to their factory default values.

Status sheet printing: Holding down the push button for three seconds or more while the printer is ready to print causes the module internal setting parameters to be printed out.

LED Communication Indicators:

The on-board green LED lights when a link to the Ethernet is established, while the yellow on-board LED lights when the printer receives print data.

Basic Communications Protocols:

IP, ARP, ICMP, UDP, TCP

Printing Communications Protocols:

LP and LPR (transfers printing data):

- Name of remote printer: aux
- Printers simultaneously connectable: 10 maximum
- Number of connected printers that can print: 1 (other users must wait until the printing is done.)
- Time out: 5 minutes
- Job deletion: Not supported
- Banner printing: Not supported

TCP Socket Port (Transfers printing data and printer status with direct socket communications):

- Port Type: TCP communications port for direct printing
- Port number: 9100
- Port communication direction: bi-directional
- Time out: 5 minutes

Protocols for obtaining and setting status (HTTP, SNMP, ENPC):

HTTP (Displays module status and makes setting with the web browser.):

- Port Number: 80
- User Name: Epson (Default)
- Password: "" (no password)
- Printers simultaneously connectable: 1 maximum
- HTTP version: HTTP/1.1

SNMP (MIB = “Management Information Base”, PDU = “Protocol Data Unit”):

- SNMP Version: SNMP v1 (RFC1157) compliant (SNMP v2 not supported)
- Transport Protocol: UDP/IP
- Community (each item may be up to 16 ASCII characters):

Community	Object Attribute	Default
#1	Read only	“public”
#2	Read/Write	None
Trap #1	Read/Write	None
Trap #2	Read/Write	None

- Trap Destination: Up to two settable IP Addresses
- MIB Support:
 - Part of MIB-II (RFC1213)
 - Part of Printer MIB
 - Part of Host Resource MIB
 - Part of Print Server MIB
 - Part of Printer MIB
- PDU Support:
 - Get Request
 - Get Next Request
 - Set Response
 - Trap
- Server Port Number: 161
- Trap Sending Port Number: 162

ENCP:

- Protocol: UDP/IP
- UDP Port Number: 3289
- Compatible packet types: Probe, Initialize, Query, Setup, Notify

Automatic IP Address Protocols:

Automatic IP addressing is executed in the order shown in the table below. If DHCP is disabled or IP addressing for DHCP fails, then IP addressing for the next protocol is executed. If APIPA is disabled or IP address cannot be obtained, use the internal setting parameters.

Protocol	Order	Application
DHCP	1	Obtains IP address
APIPA	2	Assigns IP address
Manual setting	3	Uses the internal set parameters

IP Address obtainment with DHCP:

When a DHCP client boots up, it searches a DHCP server for an IP address, subnet mask, and other possible DHCP options configured on the server, and they are temporarily assigned.

- Items to obtain: IP address, subnet mask, gateway address
- Number of DHCP Discover retry retries: 4 times
- DHCP Discover retry intervals:
 - First try:** 4 seconds after receiving the order for IP address obtainment.
 - Second try:** 7 seconds from the first try
 - Third try:** 15 seconds from the first try
 - Fourth try:** 32 seconds from the first try
- Number of DHCP request retries: 10 times
- DHCP Request retry interval: 15 seconds

IP Address obtainment with APIPA:

- Items to obtain IP address
- IP address range 169.254.1.0 to 169.254.254.255

If the DHCP client is unable to find the information, it uses APIPA to automatically configure itself with an IP address from above range. If an IP address is assigned by APIPA, it is not possible to communicate through a router.

Manual Setting:

The BA-T500II operates in accordance with the IP address in the internal parameter settings (reference the table on the next page).

Internal Ethernet Parameter Settings:

Articles	Parameters	Initial Values	Utility		Browser		Status Sheet Printing
			Ref.	Setting	Ref.	Setting	
IP Address		192.168.192.168	Yes	Yes	Yes	Yes	Yes
Subnet Mask		255.255.255.0	Yes	Yes	Yes	Yes	Yes
Gateway Address		0.0.0.0	Yes	Yes	Yes	Yes	Yes
DHCP	Enable/Disable	Disable	Yes	Yes	Yes	Yes	Yes
APIPA	Enable/Disable	Disable	Yes	Yes	Yes	Yes	Yes
ARP+Ping	Enable/Disable	Enable	Yes	Yes	Yes	Yes	No
Community name 1 (read only)	Max. 16 Chars.	"public"	Yes	No	Yes	No	Yes
Community name 2 (read-write)	Max. 16 Chars	None	Yes	Yes	Yes	Yes	Yes
IP Trap 1 Enable	Enable/Disable	Disable	Yes	Yes	Yes	Yes	No
IP Trap 2 Enable	Enable/Disable	Disable	Yes	Yes	Yes	Yes	No
Community name (IP Trap #1)	Max. 16 Chars.	None	Yes	Yes	Yes	Yes	No
Community name (IP Trap #2)	Max. 16 Chars.	None	Yes	Yes	Yes	Yes	No
IP Trap #1 Address		None	Yes	Yes	Yes	Yes	No
IP Trap #2 Address		None	Yes	Yes	Yes	Yes	No
Password		None	No	Yes	Yes	No	No
Physical Layer Setting	Auto Negotiation / 10Base-T Half / 10Base-T Full /100Base-TX Half /100Base-TX Full	Auto Negotiation	Yes	Yes	Yes	Yes	Yes
Hardware Version	---	---	Yes	No	Yes	No	Yes
Firmware Version	---	---	Yes	No	Yes	No	Yes
MAC Address	---	---	Yes	No	Yes	No	Yes

Notes pertaining to Ethernet Settings:

Changing internal parameter settings:

Internal parameter settings can be changed with the following methods:

- ENPC protocol
- HTTP browser
- arp and ping commands (Only IP address is settable.)

Setting with a dedicated utility:

Epson provides a dedicated utility that makes miscellaneous settings with the ENPC protocol.

Setting with a browser:

An HTTP browser can make setting when connected to the module. The new IP address takes effect when the printer power is turned off and back on.

Setting the IP Address with arp + ping:

This function is available only when it has been enabled. The setting can be made only from a host PC that supports both arp and ping commands and is in the same segment as the module. The new IP address takes effect when the BA-T500II E responds to the ping command.

Example1: When using Sun OS

```
arp -s 123.456.789.123 00:00:85:06:00:01 temp  
ping 123.456.789.123
```

Example2: When using Windows OS

```
arp -s 123.456.789.123 00-00-85-06-00-01  
ping 123.456.789.123
```

How to check the Mac Address:

The Mac address of the BA-T500II E can be confirmed with the following methods:

- Printing the status sheet
- Label attached to the BA-T500II E
- Using HTTP browser
- Printer self-test

Start up period:

To initialize the BA-T500II E and network connection, there is start up period after the power of printer is turned on or reset. The start up period depends on the IP address setting as follows:

When setting IP address manually: approximately 6 seconds

When setting IP address automatically: approximately 13 seconds (It may take some more time, depending on the DHCP server response time.)

During this period, no network function works.

Setting the TM printer:

A Start up period is required after turning the printer power on (as described above).

To run a printer self-test, hold the FEED button down during this period.

5 Drivers for the Printer

Printer drivers for the MTP-1530II may be downloaded through the Telpar website at www.telpar.com under the “**Drivers and Support**” tab.

First select “**Printer Drivers**” from the “**Drivers and Support**” drop-down list.

Next, select the “**MTP-1500 Printer Drivers**” option.

Finally, select the “**Windows Drivers for the MTP-1500...**” zip file and download it to your computer.

Note, the zip file includes driver installation instructions. Also, it is important to note that the MTP-1530II uses the BA-T500II Control board. Therefore, you will be installing the driver for the **EPSON BA-T500II** Receipt Printer in order to successfully operate your MTP-1530II printer through the driver.

The downloaded zip file will contain two executable files(.exe files), a text file (.txt file) and a pdf file:

- Double clicking on the **pdf** file contained in the downloaded zip file will open the driver installation manual.
- The file that starts with “**APD_**” is the print driver installation program. By double clicking this file, you will start the driver installation setup program. Follow the prompts and the manual instructions to properly install the printer driver.
- By double clicking on the file that starts with “**APDMAN**” opens a program which allows you to modify the current printer driver installation configuration.
- Double clicking the **.txt** file will open the “read me” text file which will provide technical details about the printer driver software.

6 Specifications

6.1 General Specifications

General Specifications		
Specifications	MTP-1530	
Printing method	Thermal-sensitive line dot method	
Dot Structure	576 dots/line	
Dot Density	0.125 mm (8 dot/mm)-Dot density 203dpi X 203 dpi (dpi = Dots per Inch)	
Effective printing area	72 mm	
Paper type	Thermal Sensitive paper	
Paper width	79.5 +/- 0.5 mm	
Paper thickness	56~150 µm (0.0022 – 0.0059")	
Cutting type	Full or partial (Depends on printer mechanism)	
Number of columns (default)	48 columns/line (12x24 dot font)	
Printing speed	Approx. 9.84 in/s (250 mm/second) Approx. 66 lines per second -- --(Font A printing, line spacing = 30 dots) Approx. 177 mm/s (4.61 in/s) for barcodes NOTE: Print speed may be slower depending on data transmission rate, control commands used, environmental conditions, supply voltage, and print density selected.	
Character composition, Number of characters per line	FontA = 12x24 dots 48 columns FontB = 9x17 dots 64 columns	
CHARACTER SIZE (mm): 12x24 – 9x17 (normal size)	1.25 W by 3.0 H 0.88 W by 2.13 H	
Receive Buffer	4 KB	
Interface options:	IEEE-1284(Centronics) Parallel RS232C Serial USB 2.0 Ethernet (10BASE-T and 100BASE-TX)	
Dimensions of printer:	See Section 6.3 for detailed dimension information.	
Weight of printer (no paper roll):	Approx. 3.6 lbs (1.6 Kg)	
Power Supply	For head	See Section 1.5 – Power Supply Requirements. DC 24V± 5%, 1 A typical while feeding paper DC 24V± 5%, 0.9 A max. 0.11A typical
	For motor	
	For cutter	
Expected Life	Mechanism	15 million lines (except print head & cutter) Print head: 100 million pulses
	Cutter	1 million cuts (750,000 when 30 degrees C or above and 60% RH or above)
Environmental condition	Operating temperature	-20 to +60°C (-4F to 140F)
	Operating humidity	10 to 85% RH (No condensation)
	Storage temperature	-25 to +70°C
	Storage humidity	10 to 90% RH (No condensation) except for paper
Detection	Head temperature	By thermistor (applied energy control, abnormal temperature detection)
	Paper present/out	By photointerrupter
	Platen open/ Paper low	Micro switch
	Black Mark (optional)	Reflective photosensor

6.2 Character Sets

6.2.1 Overview

Overview of Character Sets		
Select character code table with command ESC t n		
n	Character Set Description	Page number to see sample
0	PC437 U.S.A., Standard Europe	72
1	Katakana	73
2	PC850 (Multilingual)	74
3	PC860 (Portuguese)	75
4	PC863 Canadian French	76
5	PC865 Nordic	77
16	WPC 1252	78
17	PC866 Cyrillic #2	79
18	PC852 Latin 2	80
19	PC858 Euro	81

PC437 U.S.A., Standard Europe Character Set, n = 0

MTP-1500 CHARACTER SET																
PC437 (U.S.A., Standard Europe																
Power On default or ESC t 00hex																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	Ç	ü	é	â	ä	å	ç	ê	ë	è	ï	í	ï	Ä	Å	
90	É	Ê	Ë	Ì	Í	Î	Ï	Ñ	Ò	Ó	Ô	Õ	Ö	Ø	£	¥
A0	á	í	ó	ú	ñ	ª	º	¿	¬	½	¾	¡	«	»		
B0	⌘	⌘	⌘		†	‡	§	¶		¶	⌘	⌘	⌘	⌘	⌘	⌘
C0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
D0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
E0	α	β	Γ	π	Σ	σ	μ	τ	φ	θ	Ω	δ	ω	φ	ε	Π
F0	≡	±	≥	≤	∫	∫	÷	≈	°	•	√	n	²	■		

Katakana Character Set, n = 1

MTP-1500 CHARACTER SET																
Katakana																
ESC t 01hex																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20	!	"	#	\$	%	&	'	(*	+	,	-	.	/		
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
A0	。	「	」	、	・	ヲ	アイ	ウ	エ	オ	ヤ	ユ	ヨ	ツ		
B0	-	ア	イ	ウ	エ	オ	カ	キ	ク	ケ	コ	サ	シ	ス	セ	ソ
C0	タ	チ	ツ	テ	ト	ナ	ニ	ヌ	ネ	ノ	ハ	ヒ	フ	ヘ	ホ	マ
D0	ミ	ム	メ	モ	ヤ	ユ	ヨ	ラ	リ	ル	レ	ロ	ワ	ン	”	°
E0	=	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠	≠
F0	×	年	月	日	時	分	秒	〒	市	区	町	村	人	※		

PC850 (Multilingual) Character Set, n = 2

MTP-1500 CHARACTER SET																	
PC850 (Multilingual)																	
ESC t 02hex																	
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
20	!	"	#	\$	%	&	'	()	*	+	,	-	.	/		
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_	
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~		
80	Ç	ü	é	à	ä	å	ç	ê	ë	è	í	î	ï	Ä	Å		
90	É	Æ	Ô	Ö	Û	Ü	Ý	ÿ	Ö	Ø	£	Ø	×	f			
A0	á	í	ó	ú	ñ	ã	ä	å	ç	ê	ë	è	í	î	ï	Ä	Å
B0	⌘	⌘	⌘		†	‡	§	¶	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
C0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
D0	ø	ø	é	é	í	í	ï	ï	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
E0	ó	β	ò	ò	ò	μ	β	ρ	ú	ú	ý	ý	˘	˘			
F0	-	±	_	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘

PC860 (Portuguese) Character Set, n = 3

MTP-1500 CHARACTER SET																
PC860 (Portuguese)																
ESC t 03hex																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	ç	ú	é	á	ã	à	À	ç	ê	ê	è	í	ô	í	Ã	Ã
90	É	À	È	Ô	Ò	Ó	Ù	Ì	Õ	Ü	£	Ù	¤	ó		
A0	á	í	ó	ú	ñ	ã	ç	ò	~	¼	½	¾	¡	«	»	
B0	⌘	⌘	⌘		†	†	†	†	†	†	†	†	†	†	†	†
C0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
D0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
E0	α	β	Γ	π	Σ	σ	μ	τ	φ	θ	Ω	δ	ω	φ	ε	Π
F0	≡	±	≥	≤	↑	↓	÷	≈	°	.	.	√	n	²	■	

PC863 Canadian French Character Set, n = 4

MTP-1500 CHARACTER SET PC863 (Canadian-French) ESC t 04hex	
	0 1 2 3 4 5 6 7 8 9 A B C D E F
20	! " # \$ % & ' () * + , - . /
30	0 1 2 3 4 5 6 7 8 9 ; : < = > ?
40	@ A B C D E F G H I J K L M N O
50	P Q R S T U V W X Y Z [\] ^ _
60	` a b c d e f g h i j k l m n o
70	p q r s t u v w x y z { } ~
80	Ç Ü é á Â à ñ ç ê ë è ì í î ï ð ñ
90	É Ê Ë Ô Õ Æ Ï Ò Ó Æ Ø Ù Ú Û Ü
A0	^ ó ú " , ° - î ñ ò ñ ð « »
B0	⌘ ⌘ ⌘ † ‡ ¶ π ¶ ¶ ¶ ¶ ¶ ¶ ¶
C0	⌘ ⌘ ⌘ † † † † † † † † † † † †
D0	⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘ ⌘
E0	α β Γ π Σ σ μ τ φ θ Ω δ ω φ ε Π
F0	≡ ± ≥ ≤ ∫ √ ÷ ≈ ° • √ n ² ■

PC865 Nordic Character Set, n = 5

MTP-1500 CHARACTER SET																
PC865 (Nordic)																
ESC t 05hex																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20	!	"	#	\$	%	&	'	(*	+	,	-	.	/		
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	ç	ü	é	ä	å	ä	ç	ê	ë	è	í	î	ï	Ä	Å	
90	É	Æ	Ô	Ö	Û	Ü	Ý	Ö	Ø	£	Ø	Æ	f			
A0	á	í	ó	ú	ñ	ñ	º	¿	¬	½	¾	¡	«	»		
B0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
C0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
D0	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘	⌘
E0	α	β	Γ	π	Σ	σ	μ	τ	φ	θ	Ω	δ	ω	φ	ε	Π
F0	≡	±	≥	≤	∫	∫	÷	≈	°	°	°	√	n	²	■	

PC866 Cyrillic #2 Character Set, n = 17

MTP-1500 CHARACTER SET																
PC866 Cyrillic 2)																
ESC t 11hex																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П
90	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
A0	а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
B0	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣
C0	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣
D0	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣
E0	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э	ю	я
F0	Ё	ё	Є	є	Ӏ	Ӏ	ӱ	ӱ	°	•	•	√	№	¤	■	

PC852 Latin 2 Character Set, n = 18

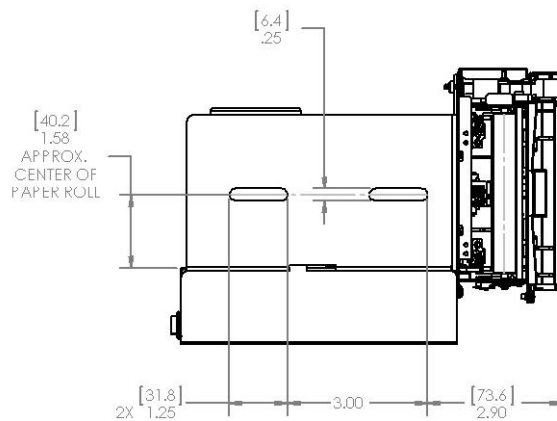
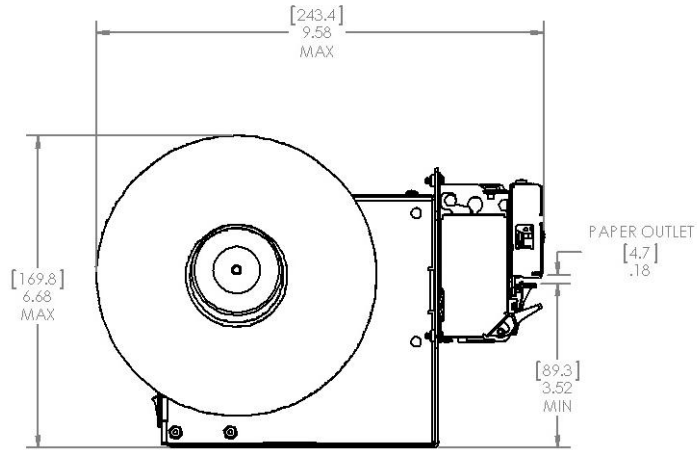
MTP-1500 CHARACTER SET																
PC852 Latin 2)																
ESC t 12hex																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	ç	ü	é	á	ä	å	ö	ç	†	ë	ö	†	ž	š	ć	
90	é	í	ô	ö	ł	ı	ś	ó	ü	ř	ł	×	č			
A0	á	í	ó	ú	ą	ż	ź	ę	ę	ż	ć	ś	«	»		
B0	☒	☒		†	Á	Ā	Ē	Š		¶	ž	ž	γ			
C0	Ł	ł	†	†	†	†	†	†	†	†	†	†	†	†	†	†
D0	đ	đ	Ď	Ď	đ	ň	í	í	ě	ı	■	■	ı	ı	ı	ı
E0	ó	ó	ó	ň	ň	š	š	ř	ú	ř	ú	ý	ý	ť	ť	ť
F0	-	˘	˘	˘	˘	˘	˘	˘	˘	˘	˘	˘	˘	˘	˘	˘

PC858 Euro Character Set, n = 19

MTP-1500 CHARACTER SET																
PC858 Euro																
ESC t 13hex																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
20	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
80	Ç	ü	é	à	â	ä	å	ç	ê	ë	è	é	í	ï	ÿ	À
90	É	Æ	ô	ö	û	ü	ÿ	ö	ü	ø	£	Ø	×	f		
A0	á	í	ó	ú	ñ	ã	ä	å	ç	ê	ë	è	é	í	ï	ÿ
B0	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ
C0	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ
D0	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ
E0	ó	β	ó	ð	ð	μ	ρ	ρ	ú	ú	ý	ÿ	ÿ	ÿ	ÿ	ÿ
F0	-	±	_	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ	ÿ

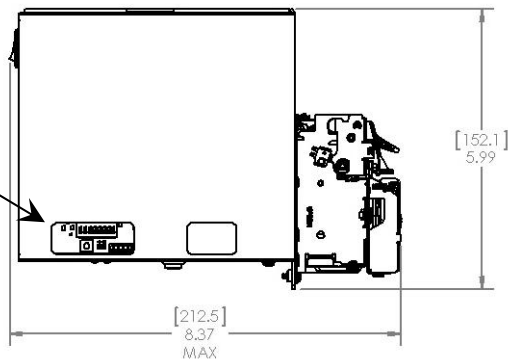
6.3 Dimensional Drawings of MTP-1530II (80 mm)

**Side view of Printer
(Paper Roll Loading
Side)**



**Bottom view of
Printer**

**Side View of Printer
(printer is shown upside
down, resting on its top.
The cutout in the side
chassis, which allow
access to the
DIPSWITCH and
Diagnostic LEDs, is
shown)**



Dimensional Drawings of MTP-1532 (82.5 mm) Version

