THERMAL PRINTING SOLUTIONS

USER MANUAL

TELESTO Printer

Reference: FDE – 31 08 271 - Issue Z

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EVOLUTIONS

Date	Issue	Modifications
03/2005	Z	Creation

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INTRODUCTION

TELESTO™ printer has been tailored to meet the true needs of the hospitality and small retail markets: design, price and performance!
With TELESTO™, Axiohm offers retailers a POS printer with the most optimized performance-to-price ratio on the market.

Thanks to its smart, trendy & compact design, TELESTO™ will add value to your POS systems while taking up a minimum of counter space. Moreover, the retailer can perfectly integrate the printer into its shop environment by choosing the colour of the printer's front cover to fully match its shop surrounding.

TELESTO™ is available as well in an 82.5mm version for gaming/lottery applications.

TELESTO™ benefits from all the leading-edge technologies as well as from the high level of quality that has made AXIOHM's products successful for years.
As proof, TELESTO™ features a high printing speed, Clamshell™ design, the most recent communication interfaces (RS232, USB and soon Bluetooth™ Class 1), bi-colour printing capability, Windows and OPOS drivers, and many other value added features.

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CONTENTS

1 TECHNICAL SPECIFICATIONS

The following table gathers the main characteristics of the printing unit.

ITEM	VALUE	UNIT
Printing Mod	Graphic, text, bar code, logo	-
Printing method	Static thermal dot line printing	-
Number of resistor dots (print area)	576 (80mm)- 640 (82.5mm)	dots
Resolution	8 horizontal & vertical	Dots/mm
Max. printing speed (1)	130	mm/s
Max. printing width	80	mm
Fonts	12*24 16*24	-
Columns	48/36 (80 mm) 53/40 (82.5 mm)	-
Code page	CP 858 – CP 437	-
Logo + Users fonts - Memory space without extension	48	Ko
Bars codes supported	Code 39 Code 128 A, B et C JAN 8 & 13 Interleaved 2 of 5 Codabar	-
Emulation	Esc/Pos™	-
Automatic cutter	Full or partial cut	-
Interfaces	USB / RS /CDKO	-
Paper roller width. Paper roller external diameter (max.). Core external diameter (min.).	80 +0/-1 (80 mm) 82.5 +0/-1 (82.5 mm) 83 18	mm mm mm mm
Paper thickness	60	µm
Recommended papers	Kanzan P310/P350/KP440	-
Paper detection	Opto-sensor	-
Over all dimensions	140*187.4*128	mm
Relative humidity	20 to 85 no condensing	%
Operating range	+5 to +45	°C
Mechanical lifetime	100	Km
Cutter life time	500 000	Cuts
Power supply - INPUT - OUTPUT	100 - 240 50 – 60 24 75 4.3	V DC Hertz V DC Watt A
Safety standard	UL, cUL, FCC, CE Class B	-

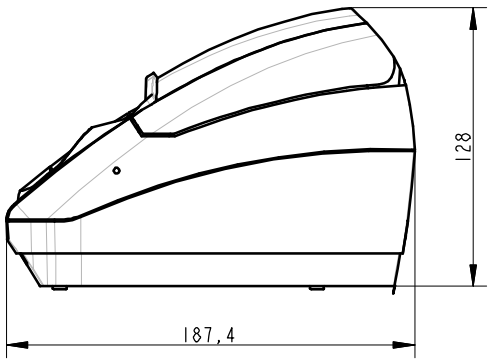
(1) In standard conditions: with recommended paper, 25% dots “On” at 25°C.

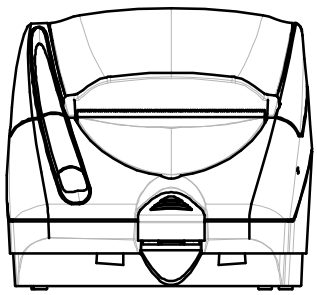
Characteristics guaranteed with the 3108213 (100-240V, 75W) Axiohm power supply.

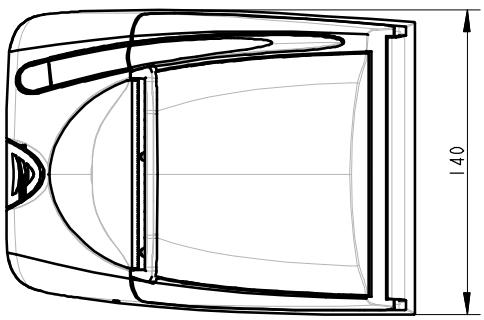
2 MECHANICAL SPECIFICATIONS

2.1 General Description

2.2 External Dimensions





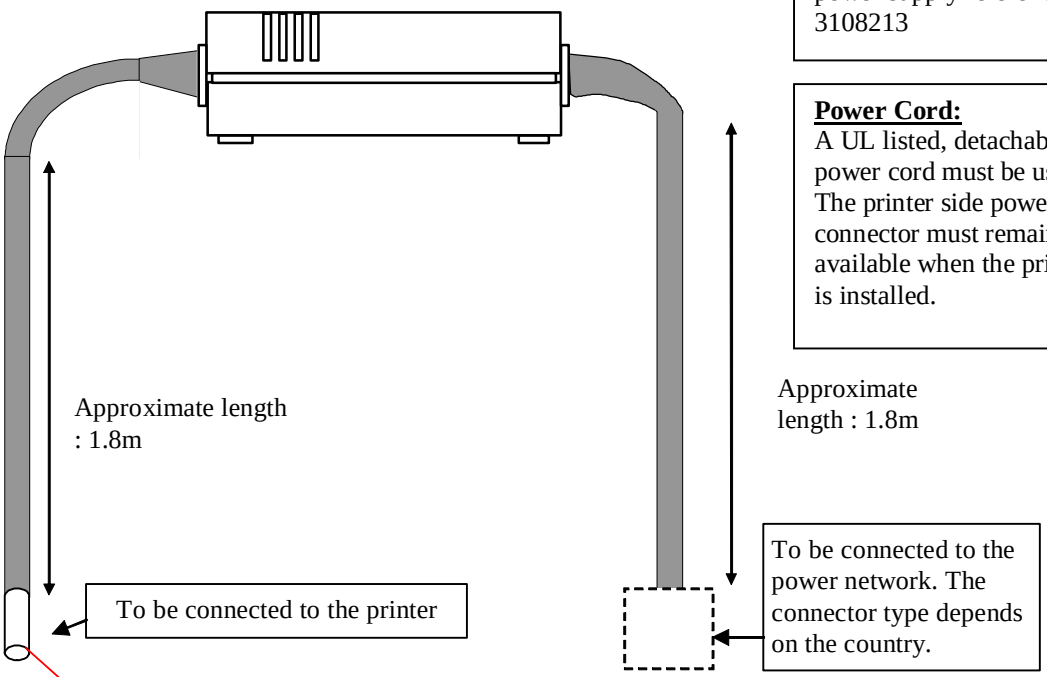


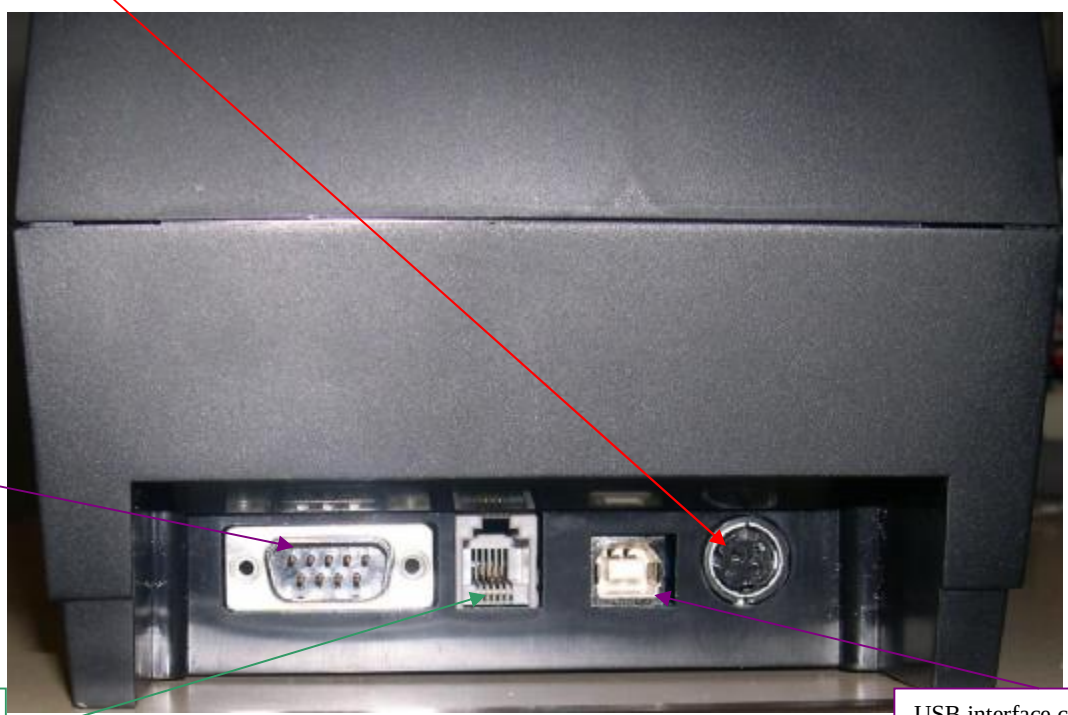
3 INTERFACE BOARD FEATURES

3.1 Plugging and Connecting your Printer Power Supply

Power Supply:
UL Listed power supply with SELV (Secondary Extra Low Voltage) non energy hazard output, limited energy source input rated 100-240 Vac, 2.0 A, 50/60 Hz, output rated 24 Vdc, 4.3 A for 75 watt unit. Product characteristics are guaranteed with Axiohm power supply reference 3108213

Power Cord:
A UL listed, detachable power cord must be used. The printer side power connector must remain available when the printer is installed.



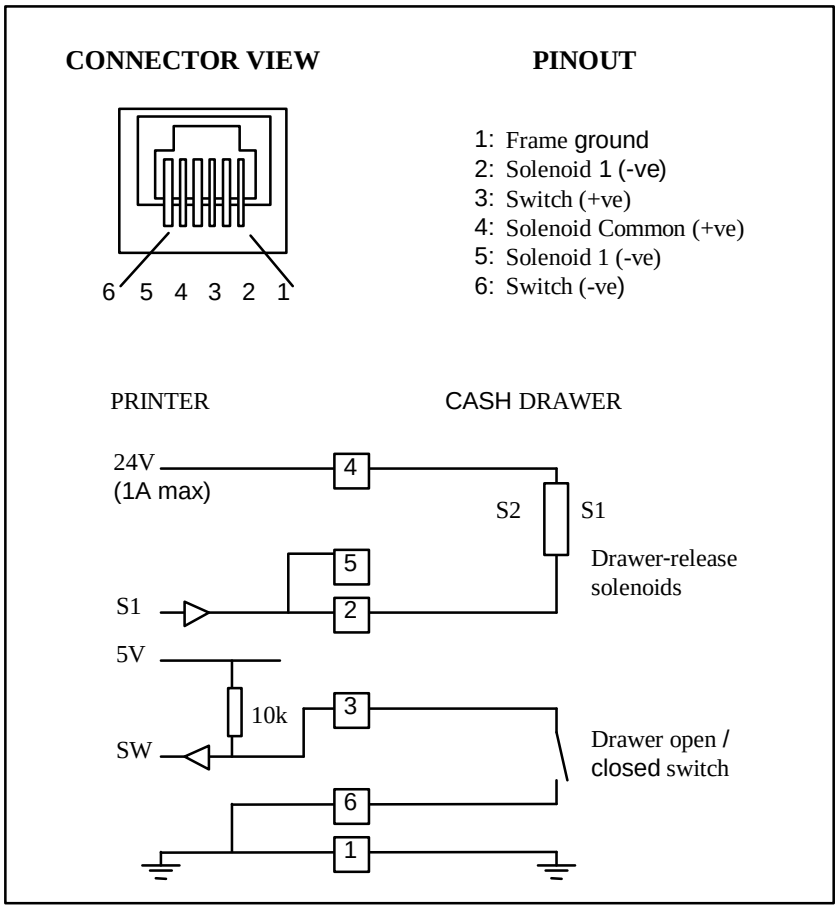


All electric interfaces are SELV compatible

3.2 Cash Drawer Kick Out connector:

- Driving voltage: 24 VDC
- Driving current: Approx. 1A max. (shall not exceed 510ms)

The connector used to open a cash drawer and monitor, whether the drawer is opened or closed, is a 6-pin modular RJ11 connector.



3.3 Communication's Management

A shielded interface cable must be used with this product. The shield must be connected to the frame or earth ground connection or earth ground reference at EACH end of the cable.
Use of a cable other than described here will require that you test the cable with the Axiohm printer and your system for FFC and CE mark certification.

3.3.1 RS232 Parameters

The parameters of this interface are :

Baudrate	Data Bit	Stop Bit	Parity	Handshaking	Parity error processing
9600	8	1	Even	Xon/Xoff	Print"?"
19200		2	Odd	DTR/DSR	Ignore
38400			None		
57600					
115200					

These parameters will be stored in EEPROM and could be adjusted by control code sequences.
Moreover, in the event of total loss of configuration, it is possible to manually reset communication parameters to 115200, N, 8, 1, DTR/DSR.
See the User Interface part.(Chap 5)

The RS-232C interface uses either XON/XOFF (software) or DTR/DSR (hardware) protocol to control the flow of information between the computer and the printer.

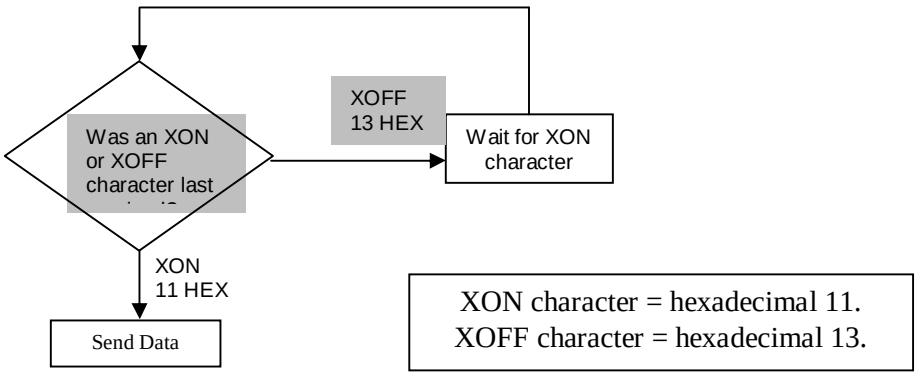
In XON/XOFF mode, a particular character is sent back and forth between the host and the printer to regulate the communication.

In DTR/DSR mode, changes in the DTR/DSR signal on the RS-232C interface controls the information flow.

3.3.1.1 XON/XOFF Protocol

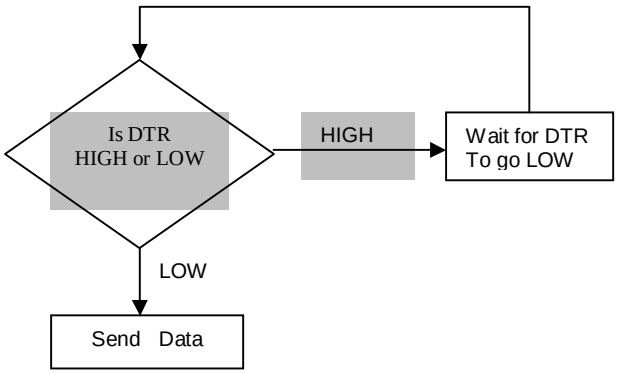
The XON/XOFF characters controls the information transfer between the printer and the host computer. The printer sends an XON character when it is ready to receive data and it sends an XOFF character when it cannot accept any more data. The software on the host computer must monitor the communication link as shown in the following flowchart in order to send data at the appropriate times.

If XON/XOFF has been selected, the printer also toggles the DTR signal, as described in the next section, but it does not look at the DSR signal to transmit data.



3.3.1.2 DTR/DSR Protocol

The DTR signal is used to control data transmission to the printer. It is driven low when the printer is ready to receive data and driven high when it cannot accept any more data.

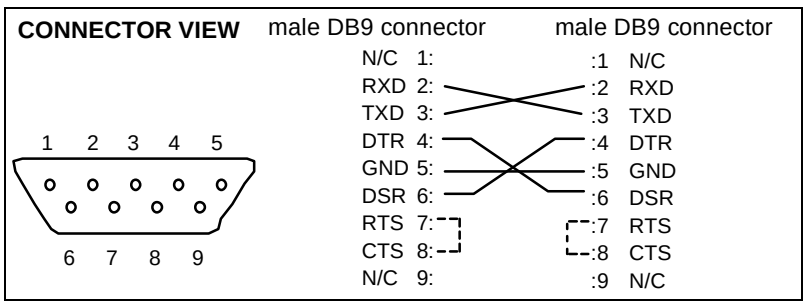


3.3.1.3 Connector :

RS232 interface uses 9-pin D-type male connectors.

RS232 Connector

Cable for DTR/DSR protocol



Note: RTS/CTS should be tied together if using DOS print commands on a PC station.

3.3.2 USB

- USB V1.1
- Full Speed communication 12 Mbits/sec
- Single USB Connector (Peripheral mode)
- The printer class is used in the protocol

Number	Type	Direction	Size	During	Description
00	Control	IN / OUT	8	-	Control end point
01	Interrupt	OUT	16	-	Real time commands
02	Bulk	OUT	64	-	Recept all printable datas
82	Bulk	IN	64	-	Synchronous datas and status

Axiohm implementation of USB complies with “Universal Serial Bus Specification” V1.1

Capabilities

Telesto is a device only, and doesn’t provide hub capabilities.
The maximum recommended cable length is 3 meters.
Full speed communications (12Mbits/sec) are supported.

Connector

The connector is located at the rear of the board, and is of B-type
Refer to USB specification rev 1.1 chapter 6 for more information.

Interface

The data are exchanged between host and printer via four endpoints:

Endpoint 0x00: CONTROL
Default endpoint

Endpoint 0x02: BULK OUT
For all printable data transmission and commands from host to printer.

Endpoint 0x82: BULK IN
For return of all synchronous data, status or other types of information , from printer to host

Endpoint 0x01: INTERRUPT OUT
For real time transmission commands from host to printer.

Other information

Vendor Id
Axiohm USB Vendor Id = 0x05D9

Product Id
TELESTO Product Id = 0xA000

Remark: USB interface is detected automatically and having priority on Rs232 interface.

3.4 Print Specification

3.4.1 Print density and density of receipt print lines

This function makes it possible to adjust the energy level of the printhead to darken the printout. An adjustment should only be made when necessary. The factory setting is 100%.

Warning:
Choose an energy level no higher than necessary to achieve a dark printout.
Failure to observe this rule may result in a printer service call or voiding of the printer warranty. Consult your Axiohm technical support specialist if you have any questions.

3.4.2 Duty Cycle restrictions

There are restrictions on the duty cycle because of the heat generated by the receipt thermal print head when printing solid blocks (regardless of the length of the block in relation to the print line). The restrictions are ambient temperature, the percentage of time (measured against one minute) of continuous solid printing, and the amount of coverage.

Caution: When the duty cycle approaches the limits shown in the table, the receipt print head will heat up. If print head temperature exceeds 65 °C, a safety feature will shut down the print head to prevent damage.

Another cause for duty cycle restriction is paper feed motor temperature increase due to continuous printing.

Allowable Duty Cycle (measured over one minute of continuous printing)

For reference:

- A typical receipt with text (contains some blank spaces) is approximately 12% dot coverage.
- A full line of text characters (every cell on the line has a character in it) is approximately 25% dot coverage.
- Graphics are approximately 40% dot coverage.
- Barcodes are approximately 50% dot coverage.
- A solid black line is 100% dot coverage.

- **Max duty cycle:**
  - Printing: 20% (with 25% dot coverage)
  - Cutter: 8% (average interval between two cuts: 12sec)

3.4.3 Characters Print Modes

Available print modes:

- Standard
- Double High
- Double Wide
- Underlined
- Reverse

Characters sizes for the Standard:

	12x24	**16x24**
Characters per Inch:	16.9	12.7
Characters per Line:	48 for 80.0 mm Paper	36 for 80.0 mm Paper
Characters per Line :	53 for 82.5 mm Paper	40 for 82.5 mm Paper
Cell Size:	12 x 24 Dots	16x24 Dots

3.4.4 Print zone

Print Zones for 80 mm (3.15 inches) paper:

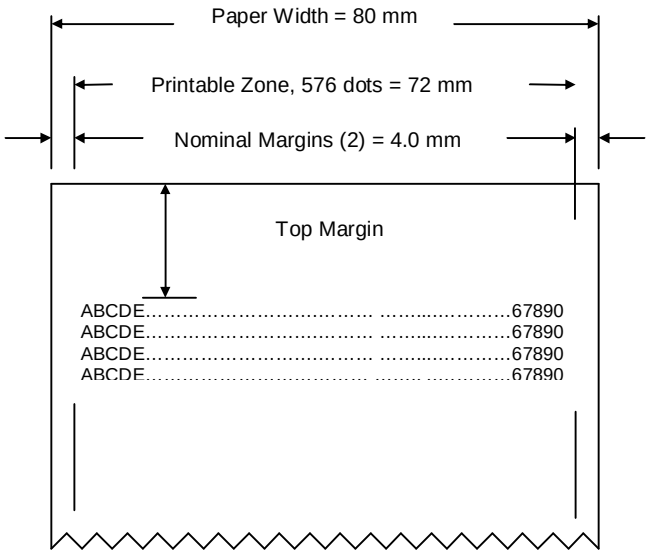
576 dots (addressable) @ 8 dots/mm, centered on 80 mm

Standard mode: 48 columns = 72 mm (2.83 inches)

Standard Mode: minimum margins: 4.0 mm (.157 inches)

Top margin to manual knife cut: 31 mm (0.70 inches)

Top margin to knife cut: 12.5 mm (0.49 inches)



Print zone for 82.5 mm (3.25 inches) paper:

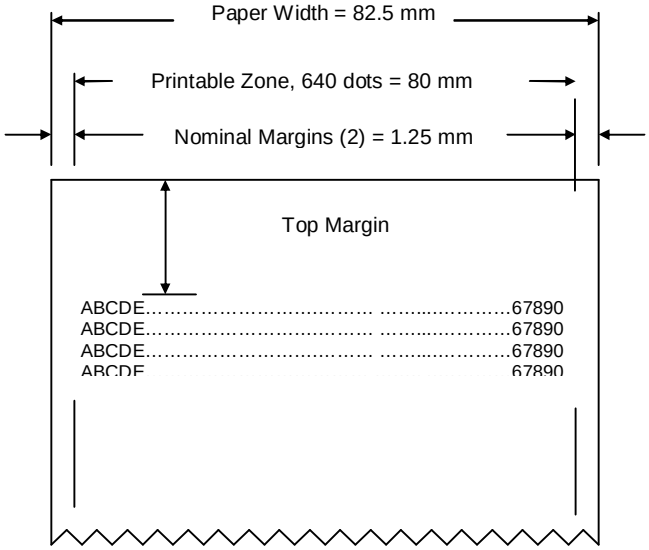
640 dots (addressable) @ 8 dots/mm, centered on 82.5 mm

Standard mode: 53 columns = 80 mm (3.14 inches)

Standard mode: minimum margins: 1.25 mm (0.049 inches)

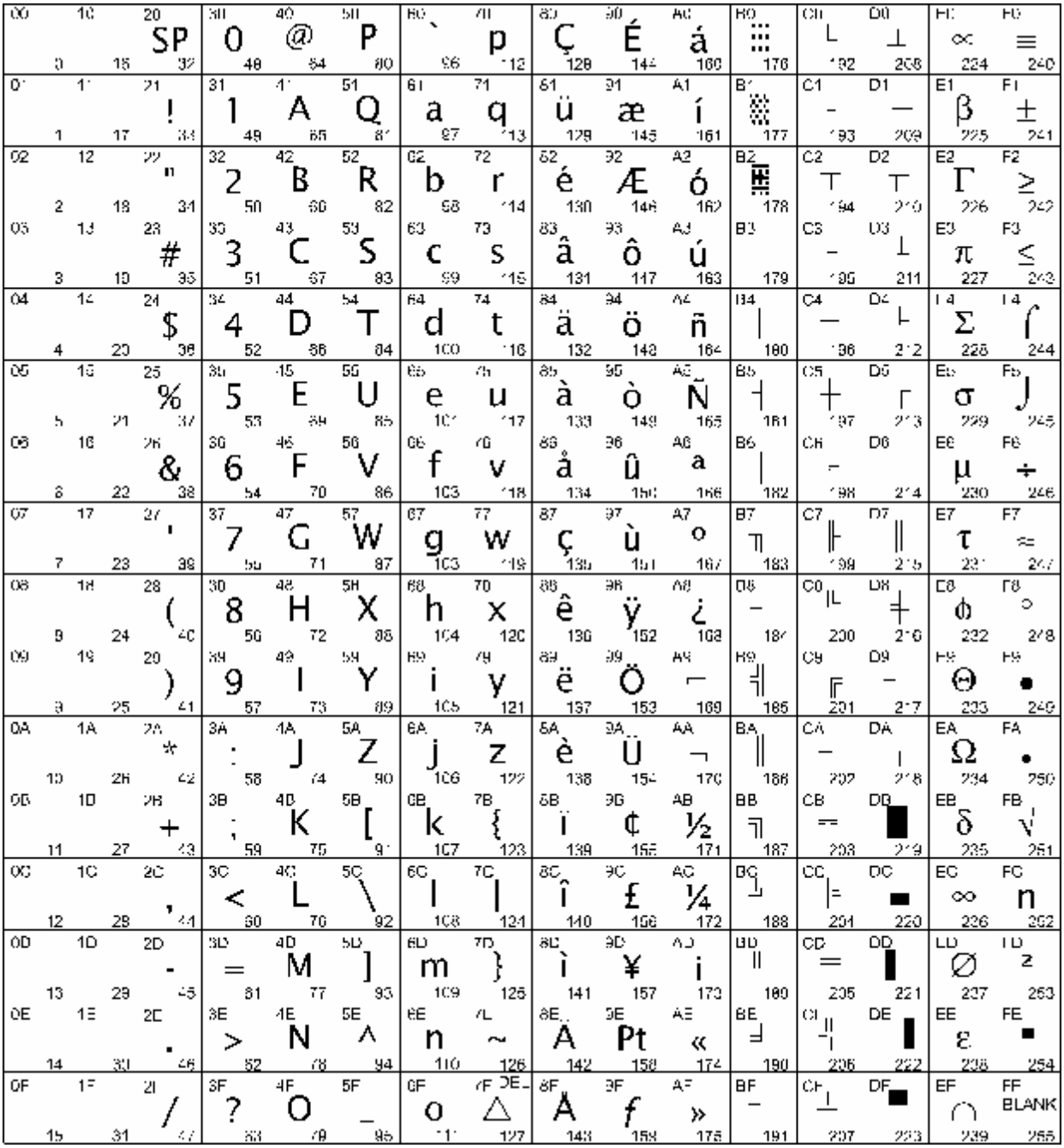
Top margin to manual knife cut: 31 mm (0.70 inches)

Top margin to knife cut: 12.5 mm (0.49 inches)

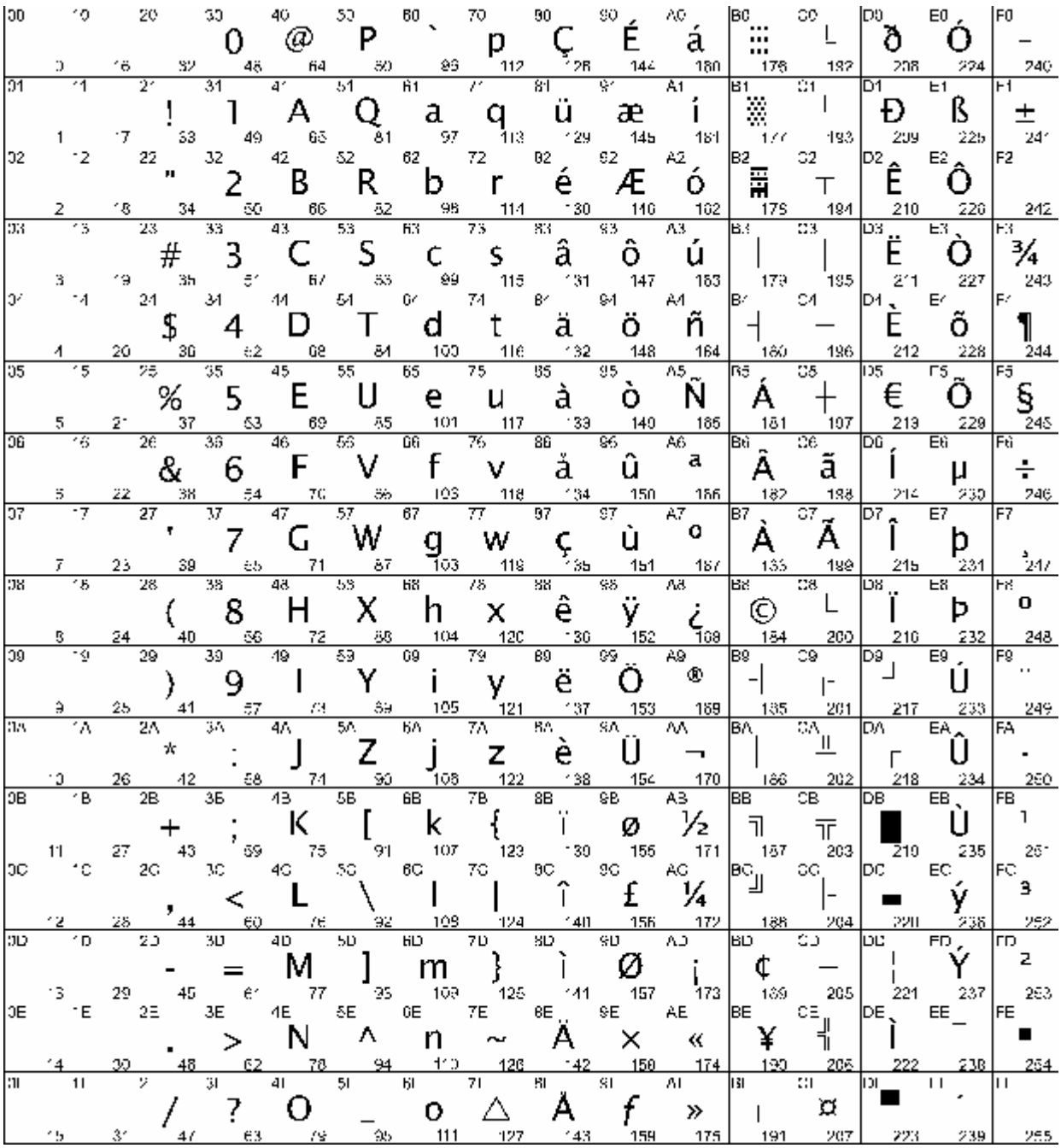


3.4.5 Character sets

3.4.5.1 Code Page 437



3.4.5.2 Code Page 858



4 CONFIGURATION MENU

Printers are generally shipped with all the functions and parameters pre-set at the factory.
The configuration can be changed by using software commands as described in the "Configuration Commands" chapter.

4.1 List of parameters that can be changed

Set Mechanism Options
- Paper Width
  - **80mm ***
  - 82.5mm
- Print density
  - 80% - 120%
  - default **100%**
- Knife Option
  - **Disabled***
  - Standard Mode
  - Low noise Mode
- Partial Cut Distance
  - 0 Steps
  - 8 Steps
  - **16 Steps ***
  - 24 Steps
  - 32 Steps
- Pre-Heating
  - Enabled
  - **Disabled ***
- Paper Low Sensor
  - **Disabled ***
  - Enabled

Set Print Options
- Demo Mode
  - **Disabled ***
  - Enabled
- Default Code Page
  - **858 ***
  - 437

Set Hardware Options
- Paper Feed Button
  - Disabled
  - **Enabled ***
- Buzzer
  - Disabled
  - **Enabled ***

Set Communication Options
- Interface Type
  - RS232
  - USB
- RS232 Baud Rate
  - **115200 ***
  - 57600
  - 38400
  - 19200
  - 9600
- RS232 Data Bits
  - **8 ***
  - 7
- RS232 Stop Bit(s)
  - **1 ***
  - 2
- RS232 Parity
  - **No Parity ***
  - Even Parity
  - Odd Parity
- RS232 Flow Control
  - **DTR/DSR ***
  - XON/XOFF

*** Standard factory default settings** (*for further information, please contact your distributor or Axiohm Technical Support Team at **www.axiohm.com***)

5 USER INTERFACE

5.1 Paper feed button

- The light is continuously “on” when the printer is ready to print.
- The light is flashing if the printer runs out of paper.
- See “troubleshooting” for other flashing modes.

5.2 Self test ticket description

To print a self ticket:

- open the lid
- push the paper feed button until the light turns off (approx 10s)
- when the light is off, immediately close the lid while holding the feed button down

Here is the description of the self test print out.

- Model Number	:	- This is a 15 digit number fixed by Axiohm.
- Serial Number	:	- This is a 10 digits number fixed by Axiohm First letter: always D Next two digits: year of production Next two digits: week of production Next 5 digits: incremental number that is reset every Monday morning.
HARDWARE		
- Flash Memory Size	:	- Total size of the main flash memory.
- External Flash	:	- Size of external flash memory option (up to 2MBytes)
- Flash Size User	:	- Amount of Flash memory allocated to logos or user defined fonts.
- SRAM Size	:	- Total size of the RAM Memory
- CPU Clock Freq.	:	- Microprocessor Clock frequency.
- Buzzer	:	- Enable buzzer operation
- Paper feed Button	:	- Enable paper feed button operation. Note that this setting is volatile and lost upon printer reset
MECHANISM		
- Paper Width	:	- Paper width used.
- Print Density	:	- Percentage of the nominal heating time value for specified paper.
- Knife	:	- Enable Knife Operation.

- Partial Cut	:	- Indicate the number of motor steps to perform a partial cut.
- Paper Low Sensor	:	- Enable Paper Low sensor management.
- Pre Heating	:	- This mode is used to maintain print head temperature above minimum value.
- Max Speed	:	- Printer top speed limit.
COMMUNICATION		
- RX Buffer Size	:	- This indicates the size of the data Input buffer (Bytes).
- Interface Type	:	- Indicates if RS232 or USB interface is used. Automatic detection of USB interface
Baud rate	:	Baud rate Value.
Data Bits	:	Number of data bits.
Stop Bit(s)	:	Number of stop bit(s).
Parity	:	Type of parity to control frame validity.
Flow Control	:	Hardware or software handshaking.
Reception Errors	:	Indicates which action is to be done when a wrong data is received.
PRINT OPTIONS		
- User Logo defined	:	- Current status = Yes if at least one logo is defined.
- User Char defined	:	- Current status = Yes if at least one font is defined.
- Code Page (437,858)	:	Indicates default internal code page selected upon reset.

(*For further information, please contact your distributor or Axiohm Technical Support Team at* ***www.axiohm.com***)

Examples:

RS232

```
*** DIAGNOSTICS FORM ***

- Model number      : 0000000000000000
- Serial number     : 0000000000

BOOT FIRMWARE
- Revision          : V1.25
- CRC               : 6353
FLASH FIRMWARE
- Revision          : V1.02
- CRC               : 34FA

HARDWARE
- Flash Memory Size : 72 kbytes
- External Flash    : No
- Flash User Size   : 48 kbytes
- SRAM Size         :  6 kbytes
- CPU Clock Freq.   : 24 MHz
- Buzzer            : Disabled
- Paper Feed Button : Enabled

MECHANISM
- Paper Width       : 80 mm
- Print Density     : 100%
- Knife             : Enabled
- Partial Cut       : 16 Step(s)
- Pre Heating       : Off

COMMUNICATION INTERFACE
- RX Buffer Size    : 1024
- Interface Type    : RS232
- Baud Rate         : 115200
- Data Bits         : 8
- Stop Bit(s)       : 1
- Parity            : NONE
- Flow Control      : Dtr/Dsr
- Reception error   : Ignore

PRINT OPTIONS
- User Logo defined : No
- User Char defined : No
- Code Page         : 858
- Demo Mode         : Disabled
```

USB

```
*** DIAGNOSTICS FORM ***

- Model number      : 0000000000000000
- Serial number     : 0000000000

BOOT FIRMWARE
- Revision          : V1.25
- CRC               : 6353
FLASH FIRMWARE
- Revision          : V1.02
- CRC               : 34FA

HARDWARE
- Flash Memory Size : 72 kbytes
- External Flash    : No
- Flash User Size   : 48 kbytes
- SRAM Size         :  6 kbytes
- CPU Clock Freq.   : 24 MHz
- Buzzer            : Disabled
- Paper Feed Button : Enabled

MECHANISM
- Paper Width       : 80 mm
- Print Density     : 100%
- Knife             : Enabled
- Partial Cut       : 16 Step(s)
- Pre heating       : Off

COMMUNICATION INTERFACE
- RX Buffer Size    : 1024
- Interface Type    : USB

PRINT OPTIONS
- User Logo defined : No
- User Char defined : No
- Code Page         : 858
- Demo Mode         : Disabled
```

5.3 *Paper Loading*

Step n°1: Push button to open lid

Step n°2 (See indications for correct setting of the roll)

Step n°3: Place roll inside the bucket, keeping the end out

Step n°4: Close the lid

5.4 *Buzzer*

The Buzzer is used to signal :

- Printer RESET function (one beep),
- BOOT mode (two beeps)
- User operation (1B 07 control code)

6 LIST OF CONTROL COMMANDS

Code (Hexadecimal)	Command	Page
1D 2A *n1 n2 d1...dn*	Define Downloaded Bit Image in Flash Memory	47
1D 2F *m*	Print Downloaded Bit Image	49
1D 40 *n*	Erase User Flash Sector	50
1D 42 *n*	Select or Cancel White/Black Reverse Print Mode	40
1D 48 *n*	Select Printing Position of HRI Characters	63
1D 49 *n*	Transmit Printer ID	53
1D 49 40 *n*	Transmit Printer ID, Remote Diagnostics Extension	54
1D 4C *nL nH*	Set Left Margin	37
1D 56 *m*	Select Cut Mode	29
1D 56 *m n*	Select Cut Mode and Cut Paper	29
1D 57 *nL nH*	Set Printing Area Width	38
1D 68 *n*	Select Bar Code Height	63
1D 6B *m d1...dk* NUL	Print Bar Code First Variation	64
1D 6B *m n d1...dk*	Print Bar Code Second Variation	64
1D 6C *m*	Transmit Selected A/D Channel	55
1D 72 *n*	Transmit Status (Paper sensor status, Drawer kick out status, Flash memory user sector status)	56
1D 73 *m n*	Store selected sensor threshold	74
1D 77 *n*	Select Bar Code Width	65
1D FF	Reset Firmware	27
1F 01 *d1…dn*	Erase Boot Sector, Download New Code	71
1F 02 *n1 n2 n3 n4 n5 n6*	Set Communication Interface Parameters	78
1F 03 00 n	Set Demo Mode	79
1F 03 02 n	Set Knife Option	74
1F 03 08 *n*	Set Paper Width	75
1F 03 0A *n*	Set Partial Cut Distance	76
1F 03 0B *n*	Set Preheating Mode	76
1F 03 80 *n*	Set Default Code Page	79
1F 03 A8 *n*	Set Buzzer Option	77
1F 0B 4E 52 4A *n*	Set Print Density	77
1F 0D 43 4C 45 *n*	Reset NVRAM Parameters	80
1F 4D *nL nH*	Reverse Paper Feed	32
1F 56	Send Printer Software Version	57
1F 65 *n*	Return Logo Checksum	48
1F 74	Print Test Form	30
1F 77 *n*	Return Memory Allocation Status	58

7 COMMAND DESCRIPTION

7.1 Command conventions

The following information describes how each command is organized:

Command Name = Synopsis: A designation (not the ASCII code) used to identify the command.

Command Name, Synopsis: A designation (not the ASCII code) used to identify the command.	
ASCII	the ASCII control code
Hexadecimal	the Hexadecimal control code
Decimal	the Decimal control code
Value or Values	a description of the command operand values
Range , Limit	The upper and lower limits of the command operand
Default	The command operand default after printer reset
Formulas	Any formula used for this command.
Description:	A brief summary of the command, followed by detailed information, if necessary.
Exceptions, Notes:	Describes any exceptions to this command, for example, other commands that the command cannot be used with.
Related Information:	This section describes any related information for this command and provides references to other sections for additional information.

[BP] = Boot Program command (ASCII Title)
[MP] = Main Program command(ASCII Title)

7.2 Reset Commands

INITIALIZE PRINTER

Synopsis:	Initialize printer.	
ASCII	ESC	@
Hexadecimal	**1B**	**40**
Decimal	27	64

Description: Clears the print line buffer and resets the printer to the default settings for the startup configuration (refer to Default settings below).

Default: Single Wide, Single-High and Left-Aligned characters and reset active logo.
Default bar code settings

Character Pitch	12.7 CPI	
Number of Columns	48	(80.0mm)
Width	53	(82.5mm)
Extra Dot Rows	3	
Character Set	Default	
Printing Position	Column One	

RESET FIRMWARE

Synopsis:	Reset firmware.	
ASCII	GS	SP
Hexadecimal	**1D**	**FF**
Decimal	29	255

Description: Reboots the printer.

7.3 Paper Cut Commands

PERFORM FULL KNIFE CUT

Synopsis:	Perform Full Knife Cut	
ASCII	ESC	i
Hexadecimal	**1B**	**69**
Decimal	27	105

Description: Cuts the receipt.

Exceptions: If the receipt length is less than 40mm, the full cut command is ignored.

PERFORM PARTIAL KNIFE CUT

Synopsis:	Perform Partial Knife Cut.	
ASCII	ESC	m
Hexadecimal	**1B**	**6D**
Decimal	27	109

Description: Partially cuts the receipt. See Setting Partial Cut Distance in diagnostics. (See command 1F 03 0A n)

Exceptions: If the receipt length is less than 40mm, the partial cut command is ignored.

SELECT CUT MODE
SELECT CUT MODE AND CUT PAPER

Synopsis: Select cut mode “and cut paper”.

ASCII	GS	V	*m*	GS	V	*m*	*n*
Hexadecimal	**1D**	**56**	**m**	**1D**	**56**	**m**	**n**
Decimal	29	86	*m*	29	86	*m*	*n*

Operands: ***m*** = cut mode

n = additional distance to feed prior to cut beyond the cut position

Value of *m* Selects the mode as shown in the table below

Value of *n* Determines the cutting position

Limit :

	OPTION 1:	OPTION 2:	
Dec :	$0 \le m \le 1$; $48 \le m \le 51$	$65 \le m \le 66$	$0 \le n \le 255$
Hex:	$00 \le m \le 1$; $30 \le m \le 33$	$41 \le m \le 42$	$00 \le n \le FF$

Description: Selects a mode for cutting paper and cuts the paper.
There are two formats for this command: one requiring one parameter *m*; the other requiring two parameters, *m* and *n*; the format is indicated by the parameter *m*.

Exceptions: If the receipt length is less than 40mm, the partial cut command is ignored , the cut command is ignored.

“GS V” OPERAND DEFINITION

M		**Cut mode**
Decimal	**Hex**	
0, 48	00, 30	Full cut
1, 49	01, 31	Partial cut
50	32	Full cut then back feed paper
51	33	Partial cut then back feed paper
65	41	Feeds paper *n* steps beyond the cut position, then executes a full cut
66	42	Feeds paper *n* steps beyond the cut position, then executes a partial cut

7.4 Vertical positioning and print commands

The vertical positioning and print commands control the vertical print positions of characters on the receipt.
The commands are described in order of their hexadecimal codes.

PRINT TEST FORM

Synopsis:	Print test form.	
ASCII	US	t
Hexadecimal	**1F**	**74**
Decimal	31	116

Description: Prints the current configuration settings on the receipt.
Note : During the self test , the printer is offline

PRINT AND FEED ONE LINE

Synopsis:	Print and feed one line.
ASCII	LF
Hexadecimal	**0A**
Decimal	10

Description: Prints one line from the buffer and feeds paper one line.

ACTIVATE CARRIAGE RETURN

Synopsis:	Activate carriage return.
ASCII	CR
Hexadecimal	**0D**
Decimal	13

Description: Prints one line from the buffer and feeds paper one line.
Some applications expect the command to be ignored, while others use it as print command.

FEED N PRINT LINES

Synopsis:	Feed n print lines.	
ASCII	DC4	n
Hexadecimal	**14**	**n**
Decimal	20	n

Value of *n* The number of lines to feed at current line height setting.
Range of *n* 1-255

Description: Feeds the paper *n* lines at the current line height without printing; ignored if not at start of line.

FEED N DOT ROWS

Synopsis: Feed n dot rows.

ASCII	NAK	n
Hexadecimal	**15**	**n**
Decimal	21	n

Value of n: n/203 inch

Range of n: 1-255

Description: Feeds the paper *n* dot rows (*n*/203 inch, *n*/8 mm), without printing.

SET LINE SPACING TO 1/6 INCH

Synopsis: Set line spacing to 1/6 inch.

ASCII	ESC	2
Hexadecimal	**1B**	**32**
Decimal	27	50

Description: Sets the default line spacing to 1/6 of an inch (4, 23 mm).

SET LINE SPACING

Synopsis: Set line spacing.

ASCII	ESC	3	n
Hexadecimal	**1B**	**33**	**n**
Decimal	27	51	n

Value of *n* n/406 inch

Range of *n* 0-255

Default 0.13 inch (3.37 mm)

Description: Sets the line spacing to *n*/406 inch (*n*/16 mm).
The minimum line spacing is 8.5 lines per inch. The line spacing equals the character height when *n* is too small.

Exception: The command is valid only at the beginning of a line.

PRINT AND FEED PAPER

Synopsis: Print and feed paper.

ASCII	ESC	J	n
Hexadecimal	**1B**	**4A**	**n**
Decimal	27	74	n

Value of *n* *n*/203 inch
Range of *n*: 0-255

Description: Prints one line from the buffer and feeds the paper *n*/203 inch (*n*/8 mm).
The line height equals the character height when *n* is too small.
Sets the print starting position to the beginning of the line, after printing is completed.

PRINT AND FEED *N* LINES

Synopsis: Print and feed n lines.

ASCII	ESC	d	n
Hexadecimal	**1B**	**64**	**n**
Decimal	27	100	n

Operand: n = range
Limits : 0-255

Description: Prints one line from the buffer and feeds paper *n* lines at the current line height.

REVERSE PAPER FEED

Synopsis: Reverse paper feed.

ASCII	US	M	*nL*	*nH*
Hexadecimal	**1F**	**4D**	**nL**	**nH**
Decimal	31	77	*nL*	*nH*

Operand: n = ((nH * 256) + nL)
= Distance number of dot line (1/8 mm)

Limit : Dec: 0 < n < 32768
Hex: 00 < n < 8000

Description: Execute a reverse paper feed.
Note : Beware when using this sequence, to be sure that the paper will still be inside the printer mechanism.

7.5 Horizontal positioning commands

The horizontal positioning commands control the horizontal print positions of characters on the receipt.
The commands are described in order of their hexadecimal codes.

HORIZONTAL TAB

Synopsis: Horizontal tab.

ASCII	HT
Hexadecimal	**09**
Decimal	9

Description: Moves the print position to the next tab position set by the Set Horizontal Tab Positions command.
(1B 44 *n*1 *n*2 ... 00)
The print position is reset to column one after each line.
When no tabs are defined to the right of the current position, or if the next tab is past the right margin, Line Feed is executed.
Print initialization sets 32 tabs at column 9, 17, 25…

SET ABSOLUTE STARTING POSITION

Synopsis: Set absolute starting position.

ASCII	ESC	$	nL	nH
Hexadecimal	**1B**	**24**	**nL**	**nH**
Decimal	27	36	nL	nH

Value of n: *n* = Number of dots to be moved from the beginning of the line.
nL = Remainder after dividing *n* by 256
nH = Integer after dividing *n* by 256
The values for *nL* and *nH* are two bytes in low byte, high byte word orientation :
((nH * 256) + nL).

Description: Sets the print starting position to the specified number of dots (up to the right margin) from the beginning of the line.
The print starting position is reset to the first column after each line.

Note: Where nL is a multiple of 4.

Formulas: The example shows how to calculate 280 dots as the absolute starting position :
280/256 = 1, remainder of 24 *nL* = 24 *nH* = 1

SET HORIZONTAL TAB POSITIONS

Synopsis:	Set horizontal tab positions.				
ASCII	ESC	D	[n]	…k	NUL
Hexadecimal	**1B**	**44**	**[n]**	**…k**	**0**
Decimal	27	68	[n]	…k	0

Value of n: Column number for tab minus one
(*n* is always less than or equal to the current selected column width)

Value of k: 0-32

Default: Every 8 characters from column. 1 (9, 17, etc.) for normal print

Description: Sets up to 32 horizontal tab-position *n* columns from column one, but does not move the print position. See the Horizontal Tab command (09).

The tab positions remain unchanged if the character widths are changed after the tabs are set. The command ends with hexadecimal 00; hexadecimal 1B 44 00 clears all tabs.

The tabs cannot be set higher than the column width of the current pitch.

Formulas: Set the tab positions in ascending order and put Hex 00 at the end.
Hex 1B 44 00 (number of tabs not specified) clears all tab positions.

Example: 1B 44 03 04 07 0A 0D 18 00

09 41 09 42 09 43 09 44 09 45 09 46 0A

To obtain (in standard pitch): ---A---B--C--D----------EF

SET RELATIVE PRINT POSITION

Synopsis: Set relative print position.

ASCII	ESC	\	nL	nH
Hexadecimal	**1B**	**5C**	**nL**	**nH**
Decimal	27	92	nL	nH

Value of *n:*

To Move the Relative Starting Position Right of the Current Position:

n = Number of dots to be moved right of the current position

nL = Remainder after dividing *n* by 256

nH = Integer after dividing *n* by 256

The values for *nL* and *nH* are two bytes in low byte, high byte word orientation.

To Move the Relative Starting-Position Left of the Current Position:

n = Number of dots to be moved left of the current position

nL = Remainder after dividing (65536-*n*) by 256

nH = Integer after dividing (65536-*n*) by 256

The values for *nL* and *nH* are two bytes in low byte, high byte word orientation.

Description: Moves the print-starting position the specified number of dots either right (up to the right margin) or left (up to the left margin) of the current position.
The print starting position is reset to the first column after each line.
Any setting that exceeds the printable area is ignored.

Note: Where *nL* is a multiple of 4.

Formulas: To move to the left:
The example shows how to set the relative position 20 dots to the left of the current position.
65536-20 = 65516 65516/256 = 255, remainder of 236 *nL* = 236, *nH* = 255
To move to the right:
The example shows how to set the relative position 260 dots to the right of the current position.
260/256 = 1, remainder of 4 *nL* = 04, *nH* = 01

SELECT JUSTIFICATION

Synopsis:	Select justification.		
ASCII	ESC	a	n
Hexadecimal	**1B**	**61**	**n**
Decimal	27	97	n

Operand: n = mode selection

Value of *n*
0, 48 = Left aligned
1, 49 = Center aligned
2, 50 = Right aligned

Limits : 0-2, 48-50

Default 0 (Left aligned)

Description: Specifies the alignment of characters, logos, and bar codes (see the value of *n*).

Exceptions: The command is valid only at the beginning of a line.

SET LEFT MARGIN

Synopsis:	Set left margin.			
ASCII	GS	L	*nL*	*nH*
Hexadecimal	**1D**	**4C**	**nL**	**nH**
Decimal	29	76	*nL*	*nH*

Operand: n = ((**nH** * 256) + **nL**)

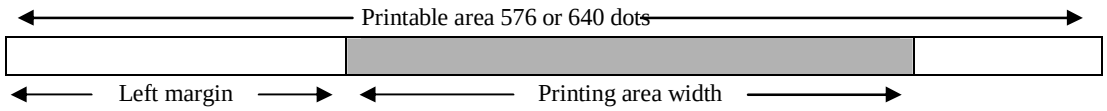
Limits:

Range of nL	0-255	
Range of nH	0-255	
Default for	80.0mm mechanism	= 576 dots(the maximum printable area)
Default for	82.5mm mechanism	= 640 dots(the maximum printable area)

Description: Sets the left margin of the printing area. The left margin is set to ((*nH* X 256) + *nL*) dots.
The Set Printing Area Width command (1D 57), sets the width of the printing area.
See the Set Printing Area Width command (1D 57) in this document for a description of that command.

Note: If the setting exceeds the printable area, the maximum value of the printable area is used.
The maximum printable area is 576 or 640. See the illustration.
The command is ignored if it is not at the beginning of the line.
Where *nL* is a multiple of 4.

Formulas: To set the left margin to one inch, send the four-byte string: GS L 203 0
Or, to set the left margin to two inches, send the four-byte string: GS L 150 1
Where 2 inches = 406/203, and 406 = (1 X 256) + 150.



SET PRINTING AREA WIDTH

Synopsis:	Set printing area width.			
ASCII	GS	W	*nL*	*nH*
Hexadecimal	**1D**	**57**	**nL**	**nH**
Decimal	29	87	*nL*	*nH*

Operand: **n** = ((nH * 256) + nL) dots

Range of nL 0-255

Range of nH 0-255

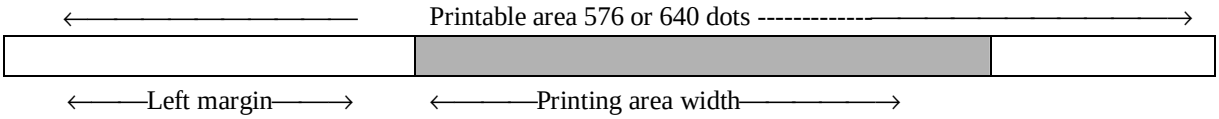
Limits : **Default 80.0mm mechanism :** 576 dots (the maximum printable area)

Default 82.5mm mechanism : 640 dots (the maximum printable area)

Description: The width of the printing area is set to n dots.
If the setting exceeds the printable area, the maximum value of the printable area is used.
The width of the printing area follows the Set Left Margin command (1D 4C).
See the Set Left Margin command (GS L) earlier in this document for a description.

Notes: The command is ignored if it is not at the beginning of the line.
If the setting exceeds the printable area, the maximum value of the printable area is used.
Where nL is a multiple of 4.
Minimum print area width = 4.

Formulas: To set the width of the printing area to one inch, send the four-byte string: GS W 203 0
Or, to set the width of the printing area to two inches, send the four-byte string: GS W 150 1
Where 2 inches = 406/203, and 406 = (1 X 256) + 150.



7.6 Print characteristics commands

These commands control what the printed information looks like, selection of character sets, and setting of margins. The commands are described in order of their hexadecimal codes.

SET RIGHT-SIDE CHARACTER SPACING

Synopsis: Set right- side character spacing.

ASCII	ESC	SP	n
Hexadecimal	**1B**	**20**	**n**
Decimal	27	32	n

Range of *n* 0 – 32

Default 0

Description: Sets the right side character spacing to [*n*].

Note: Where n is a multiple of 4.

SELECT PRINT MODE

Synopsis: Select print mode.

ASCII	ESC	!	n
Hexadecimal	**1B**	**21**	**n**
Decimal	27	33	n

Value of n:

Bit[1]	**Function**	**0**	**1**
Bit 0	Pitch	Standard Pitch (16x24)	Compressed Pitch (12x24)
Bit 4	Double High	Cancelled	Set
Bit 5	Double Wide	Cancelled	Set
Bit 7	Underlined Mode	Cancelled	Set (bar thickness = 2)

[1] Bits 1,2,3 and 6 are not used “0”

Default: 0 (for bits 0, 4, 5, 7)

Description: Selects the print mode: standard, underlined, double high or double wide.

SELECT OR CANCEL UNDERLINE MODE

Synopsis: Select or cancel underlined mode.

ASCII	ESC	-	n
Hexadecimal	**1B**	**2D**	**n**
Decimal	27	45	n

Value of *n:*

0-48 =	Cancel underline mode
1-49 =	Select underline mode and bar thickness = 2
2-50 =	

Default: 0-48

Description: Turns underline mode on or off. Underlines cannot be printed for spaces set by the Horizontal Tab, Set Absolute Start Position, Set Relative Print Position commands, or in white/black reverse print mode. Underline mode may also be turned ON and OFF with the Select Print Mode(s) command (1B 21).

SELECT OR CANCEL WHITE/BLACK REVERSE PRINT MODE

Synopsis: Select or cancel white/black reverse print mode.

ASCII	GS	B	*n*
Hexadecimal	**1D**	**42**	**n**
Decimal	29	66	*n*

Operand: n = mode selection:

Value of *n*
0 = Off
1 = On

Default 0 (Off)

Description: In White/Black reverse printing mode, print dots and non-print dots are reversed, which means that white characters are printed on a black background.

When the White/Black reverse printing mode is selected it is also applied to character spacing which is set by Right-Side Character Spacing (ESC SP).

This command can be used with built-in characters and user-defined characters, but does not affect the space between lines.

White/Black Reverse Print Mode does not affect graphics, logos, bar code, HRI characters, and spacing skipped by Horizontal Tab (HT), Set Absolute Starting Position (ESC $), and Set Relative Print Position (ESC \).

Exceptions: Only the lowest bit of *n* is valid.

7.7 Graphics Commands

These commands are used to enter and print graphics data.

PRINT RASTER GRAPHICS

Synopsis:	Print raster graphics.
ASCII	DC1 n…nX
Hexadecimal	**11 n…nX**
Decimal	17 n1…nX
Value of n:	n1…n72 = Data bytes 80.0mm n1…n80 = Data bytes 82.5mm
Range:	0 – 255
Description:	Prints one row of data. *n*1 ... *n*72: bytes describing the line to print nX=72 **è** 80.0mm. Prints one row of data. *n*1 ... *n*80: bytes describing the line to print nX=80 **è** 82.5mm.
Note :	See command 1F 03 08 n Set Paper Width.

7.8 Font commands

- **Selected Commands:**

SELECT INTERNATIONAL CHARACTER SET

Synopsis: Select international character set.

ASCII	ESC	R	n
Hexadecimal	**1B**	**52**	**n**
Decimal	27	82	n

Operand: n = mode selection

Limits : 0 - 10

Default: 0

n	Country
0	USA
1	France
2	Germany
3	UK
4	Denmark I
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark II

Description: Selects the character set mapping to be used or selected the flash user single bytes fonts. See Table below.

Additional codes

	n	35_D 23_H	36_D 24_H	64_D 40_H	91_D $5B_H$	92_D $5C_H$	93_D $5D_H$	94_D $5E_H$	96_D 60_H	123_D $7B_H$	124_D $7C_H$	125_D $7D_H$	126_D $7E_H$
U.S.A.	0	#	$	@	[	\	]	^	`	{	¦	}	~
France	1	#	$	à	°	ç	§	^	`	é	ù	è	"
Germany	2	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.	3	£	$	@	[	\	]	^	`	{	¦	}	~
Denmark I	4	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	5	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	6	#	$	@	°	\	é	^	ù	à	ò	è	i
Spain	7	Pt	$	@	i	Ñ	¿	^	`	"	ñ	}	~
Japan	8	#	$	@	[	¥	]	^	`	{	¦	}	~
Norway	9	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II	10	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

SELECT CHARACTER CODE TABLE OR ACTIVE USER-DEFINED FONT SELECTION

Synopsis: Select character code table or active user-defined font selection

ASCII	ESC	t	n
Hexadecimal	**1B**	**74**	**n**
Decimal	27	116	n

Operand: n = mode selection

Limits :

n		**Code Page**
Decimal	**Hex**	
0	00	437 : US
6	06	858 : Multilingual with Euro
48	30	Font Storage n°00
49	31	Font Storage n°01
50	32	Font Storage n°02
51	33	Font Storage n°03

Default: 6 (Code Page 858), selectable through configuration command

Description: Selects the character set to be used.
In the case of changing from Font Storage to a code page 437 or 858, the default font size will be set (16x24) .

- **Downloaded Commands:**

READ FONT INFORMATION

Synopsis: Read font information.

ASCII	FS	F	t
Hexadecimal	**1C**	**46**	**t**
Decimal	28	70	t

Operand: t = Font storage Identify

Value of t:

48	0x30 (ASCII *n* = 0)	Single Font n°00
49	0x31 (ASCII *n* = 1)	Single Font n°01
50	0x32 (ASCII *n* = 2)	Single Font n°02
51	0x33 (ASCII *n* = 3)	Single Font n°03

Returns:

OK	ACK (Hex = 06)	1 byte
	Font Id	1 byte
	Font Name	8 bytes
	Font width	1 byte
	Font Height	1 byte
	Number of characters	2 bytes < LSB , MSB>
	Checksum (Hex)	2 bytes < LSB , MSB>
Fault	NAK (Hex = 15)	1 Byte

Description: If selected font exists, this command returns ACK followed by font information.
Else it returns NAK.

CHECK EASY FONT COMPATIBILITY

Synopsis: Check Easy Font compatibility.

ASCII	FS	H
Hexadecimal	**1C**	**48**
Decimal	28	72

Returns ASCII:

OK	ACK + list of available font Ids + 00
Fault	NAK

Returns Hex:

OK	06 + list of available font Ids + 00
Fault	15

Description: This command asks the printer whether it supports or not Font download.
If it does, it also returns the list of available font Ids (single byte, double byte) that can be used to download a font.

DOWNLOAD SINGLE BYTE FONT

Synopsis: Download single byte printer font in User flash memory.

ASCII	FS	L	f8	t	*w*	*h*	{d}
Hexadecimal	**1C**	**4C**	***f8***	***t***	***w***	***h***	***{d}***
Decimal	28	76	*f8*	*t*	*w*	*h*	*{d}*

Operands:

f8	8 characters font name.
t	Font storage Id.
w	Font character width in dots, including inter-character space.
h	Font character height in dots, not including inter-line space.
d	Downloaded data bytes.

Limit Hex:

0x20 ≤ f8 ≤ 0x7F

0x30 ≤ t ≤ 0x33

0x01 ≤ w, h ≤ 0x20

0x00 ≤ d ≤ 0xFF

Returns :	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: This command will download a single byte font code page to the printer.

If the download is successful, an ACK will be returned.

If unsuccessful, a NAK will be returned. A font must always be downloaded completely, which corresponds to 224 characters.

The font name is used to identify the font. It will be printed on the diagnostics or configuration form. When a downloaded font is to be deleted, the font name is used to identify the font. Two fonts cannot have the same name. Each character is downloaded as raster, from top to bottom, and for each raster, from leftmost byte to rightmost byte. Two fonts cannot have the same storage Id.

Notes: See command select … (1Bh 74h n).

7.9 Logo commands

- **Download commands :**

SELECT THE CURRENT LOGO

Synopsis:	Select the current Logo.		
ASCII	GS	#	*n*
Hexadecimal	**1D**	**23**	**n**
Decimal	29	35	*n*

Operand: n = mode selection

Range of n: 0 – 63

Description: Selects a logo to be defined or printed. The active logo *n* remains in use until this command is sent again with a different logo *n*, or command 1B40 is sent or printer reboots.

When this command precedes a logo definition, that definition is stored in flash memory as logo *n*.

If there is already a different definition in flash memory for logo *n*, the first is inactivated and the new definition is used. The inactive definition is not erased from flash and continues to take up space in flash memory.

When this command precedes a logo print command and *n* is different from the previously active logo selected, the printer retrieves the logo definition for *n* from memory and prints it. If there is no definition for logo *n*, then no logo is printed.

Note: An application using multiple logos, into flash memory, is responsible for erasing the flash memory page when the logo area is full.

DEFINE DOWNLOADED BIT IMAGE IN FLASH MEMORY

Synopsis:	Define downloaded bit image in flash memory.				
ASCII	GS	*	*n1*	*n2*	*d1…dn*
Hexadecimal	**1D**	**2A**	**n1**	**n2**	**d1…dn**
Decimal	29	42	*n1*	*n2*	*d1…dn*

Operands:

Value of *n*1	**Value of *n*2**	**Value of *d***
1-80 (8 x *n*1 = Number of Horizontal Dot Columns)	1-255 (Number of Vertical Bytes)[1]	Bytes of Data (Printed Down, Then Across)

[1]The number of bytes sent is represented by the following formula:

n = 8 x *n*1 x *n*2 (*n*1 x *n*2 must be less than or equal to 49138 < Size User Flash memory).

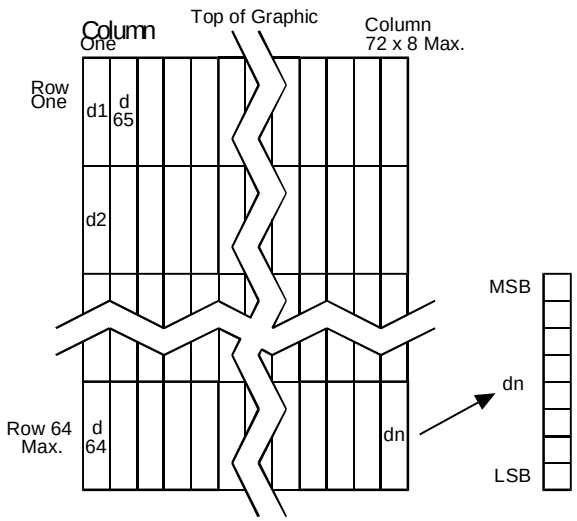
See the illustration below for a graphic representation of the downloaded bit image :

Return :	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

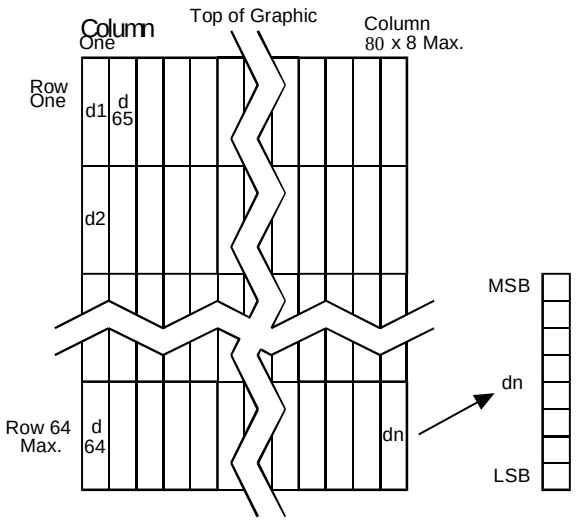
Description: Enters a downloaded bit image (such as a logo) into Flash with the number of dots specified by *n*1 and *n*2. The downloaded bit image is available until another bit image is defined, or either Initialize Printer (1B 40 o 1D 40 n), command is received.

Note: See the illustration for the Print Downloaded Bit Image command (1D 2F) for a representation of the bit image.

80 mm paper



82.5 mm paper



RETURN LOGO CHECKSUM

Synopsis:	Return the checksum of a logo.		
ASCII	US	V	*n*
Hexadecimal	**1F**	**65**	**n**
Decimal	31	101	*n*

Operand: n = Selected logo

Limit : Dec: 0 < n < 63
Hex: 0 < n < 3F

Return : 4 Bytes :

Format

Byte 1	= 65 (Hex) = Command ID	
Byte 2	= 01 (Hex) = Logo present	= 00 (Hex) = Logo absent
Byte 3	= Checksum (LSB)	= 00 (Hex)
Byte 4	= Checksum (MSB)	= 00 (Hex)

Description: Returns the checksum of a logo downloaded in flash memory (see command 1D 2A…)
Reply 4 bytes [Command ID + Flag + checksum of the logo] specified by n.
Checksum is two's complement of sum of **all** bytes in the download sequence.

Note : If n is out of range, no reply command.

Example: Checksum = - (0x1D + 0x2A + …)

- **Print logo commands:**

PRINT DOWNLOADED BIT IMAGE

Synopsis: Print downloaded bit image.

ASCII	GS	/	*m*
Hexadecimal	**1D**	**2F**	**m**
Decimal	29	47	*m*

Operand: m = mode selection:

Value of *m*	Print Mode	Vertical DPI[1]	Horizontal DPI*
0	Normal	203	203
1	Double Wide	203	101
2	Double High	101	203
3	Quadruple	101	101

[1]Dot density measured in dots per inch

Description: Prints the downloaded bit image at a density specified by *m*. It is ignored if any data is in the print buffer, if the downloaded bit image is undefined.

Note: See the illustration on the previous page for a representation of the bit image (1D 2A).

7.10 User flash memory commands

ERASE USER FLASH SECTOR

Synopsis:	Erase user flash sector.		
ASCII	GS	@	*n*
Hexadecimal	**1D**	**40**	**n**
Decimal	29	64	*n*

Operand:	n	= mode selection:	
Value of *n*:	49	*n* = 49 (ASCII *n* = 1)	Erase User flash Memory
	51	*n* = 51 (ASCII *n* = 3)	Erase User flash (Easy Font)

Returns :	**Operation completed**
ASCII	CR
Hexadecimal	**0D**
Decimal	13

Description: Erases a section of user flash memory and sends a carriage return when the operation is complete.

This command erases all 48K Flash memory sectors allocated to logos storage and fonts storage.

Those sectors should be erased: when the logo definition area is full and an application is attempting to define new logos. All logo definitions are erased and must be redefined.

Important: While erasing flash memory, all communication is disabled.

To provide feedback to the application, the printer responds to the application when the erase is complete. After sending the Erase User Flash Sector (1D 40-n) command, an application should wait for the response from the printer before sending data. Otherwise, data will be lost.

If an application is unable to receive data, it should wait a minimum of five seconds after sending the Erase User Flash Sector (1D 40 *n*) command before sending data.

7.11 Printer status commands

These commands enable the printer to communicate with the host computer. They are stored in the printer's data buffer as they are received, and are handled by the firmware in the order in which they were received.

When a fault occurs, the printer will go busy at the communication interface and not respond to either of the Printer Status commands. If the fault causing the busy condition can be cleared, such as by loading paper, or letting the thermal print head cool down, the printer will resume processing the data in its receive buffer.

Real Time commands allow the printer to respond immediately, even though it is busy at the communication interface. See the following section, Real Time Commands, for details about these commands.

TRANSMIT PAPER SENSOR STATUS

Synopsis: Sends status data to the host computer.

ASCII	ESC	v
Hexadecimal	**1B**	**76**
Decimal	27	118

Returns Values: Status Byte

Bit	Function	0 Signifies	1 Signifies
0	Paper Low	Present	Low (if paper low sensor enabled)
1	Receipt Cover	Closed	Open
2	Receipt Paper	Present	Out
3	Knife Position	Home Position	Not Home Position
4	Not Used	Fixed to Zero	Fixed to Zero
5	Temperature	In valid range	Too hot or too cold
6	Voltage	In valid range	Too high or too low
7	Not Used	Fixed to Zero	Fixed to Zero

Description: The printer sends one byte to the host computer when it is not busy or in a fault condition.

Related Information: If Paper Low sensor Option disabled **è** Paper low status is not relevant.
See Busy Line and Fault Conditions in the Real Time Commands section of this document for details about fault condition reporting.

RETURN STATIC RAM SIZE

Synopsis: Return static ram size.

ASCII	GS	BS
Hexadecimal	**1D**	**08**
Decimal	29	8

Return: 1 byte = SRAM sizes

Values (Dec):
6 kb (internal RAM only) = 0
128 kb (w/extension) = 2

Description: Returns the size of SRAM on board, on one byte as number of 64 Kbytes sectors.

RETURN HARDWARE INFORMATION

Synopsis: Return hardware information.

ASCII	GS	LF
Hexadecimal	**1D**	**0A**
Decimal	29	10

Returns: 1 bytes = Status Byte reply

Value:

Bit	Function	0 Signifies	1 Signifies
0	Last NVRAM program	OK	Failure
1	Head connector (s)	OK	Failure
2	Flash extern program	OK	Failure
3	Printer Head voltage	24V	12V
4	Pre Heating	Off	On
5	Not Used	Fixed to Zero	Fixed to Zero
6	Purge data USB	No	Yes
7	Power fail	No	Yes

Description: Sends status data to the host computer.
The printer sends one byte to the host computer when it is not busy or in a fault condition.

Note: Last NVRAM program bit 0: Reset each write NVRAM command.
Power fail bit 7: after first read go to zero.
Purge data USB bit 6: after read go to zero.

TRANSMIT PRINTER ID

Synopsis: Transmit printer Identify

ASCII	GS	I	*n*
Hexadecimal	**1D**	**49**	**n**
Decimal	29	73	*n*

Operand: **n** **= Printer ID select**

Limit decimal: $1 \le n \le 2$; $49 \le n \le 50$; n = 66,67,68

Limit hex: $01 \le n \le 02$; $31 \le n \le 32$; n = 42,43,44

Description: Transmits the printer model, type of version as defined below.
This command is processed as normal printer data.

Note: For n = 66, 67, 68 the printer response is sent back in the following format:

Header: 5F (hex)
Data: ASCII string
NULL: 00 (hex)

"GS I" OPERAND AND RETURNED STATUS DEFINITION

n		Printer ID	Function		Value	
Decimal	**Hex**				**Decimal**	**Hex**
1, 49	01, 31	Model	TELESTO		51	33
2, 50	02, 32	Type	Bit	Function	Value	
					0	1
			0	2-byte character code	Not installed	Installed
			1	Knife	No knife	Installed
			2	Undefined		
			3	Undefined		
			4	Fixed	Always 0	-
			5	Undefined		
			6	Undefined		
			7	Fixed	Always 0	-
66	42	Manufacturer	_AXIOHM			
67	43	Printer name	_TELESTO			
68	44	Serial number	Depends on actual S/N			

TRANSMIT PRINTER ID, REMOTE DIAGNOSTICS EXTENSION

Synopsis:	Performs the remote diagnostic functions specified by *n*.			
ASCII	GS	I	@	*n*
Hexadecimal	**1D**	**49**	**40**	**n**
Decimal	29	73	*64*	*n*

Operand:	**n**	mode selection
Values of n:		Refer to table below
Return format::	n	+ data +<CR>

Description: Performs functions specified by *n (Refer to table).*

Exceptions: If any digit is out of the defined range, Write to NVRAM is ignored.

Value of *n*		**Remote diagnostic item**		**Function**
Hex	**Dec**			
20	32	Serial #, 10 digit ASCII	*	Write to NVRAM Example, send 14 bytes to printer: GS I @ 0x20 1234567890
23	35	Serial #		Return Serial #, preceded by *n* to identify Printer returns 12 bytes in above example: #1234567890<CR>
24	36	Class/model #, 15 digit ASCII	*	Write to NVRAM
27	39	Class/model #		Return Class/model #, returns 17 bytes
2F	47	Boot firmware CRC, 4 digit ASCII		Return Boot firmware CRC, returns 6 bytes
37	55	Flash firmware CRC, 4 digit ASCII		Return Flash firmware CRC, returns 6 bytes
97	151	Boot firmware version		Return Boot firmware version, returns 6 bytes
A3	163	Flash firmware version		Return Flash firmware version, returns 6 bytes

* $0x20 \leq digit \leq 0x79$

TRANSMIT SELECTED A/D CHANNEL

Synopsis:	Transmit selected A/D channel (Voltage, Temperature).		
ASCII	GS	l	*m*
Hexadecimal	**1D**	**6C**	**m**
Decimal	29	108	*m*

Operand:	m	= Selected channel :
Value of *m*	8	= Voltage Value
	9	= Temperature Value
Returns:	1	Byte , see below

Description: Returns the value off the voltage or temperature.
Note: Tolerance not taken into consideration, calculation not precise.

- ***m* = 0x08 :**

Sends an octet of between 0 and 255 = Value measured on the A-D converter = AD measure

Formulas: Voltage (V) = 0.11274 x AD measure

Example: AD measure = *213* **è** Voltage = *24.01V*
AD measure = *186* **è** Voltage = *21.00V*

- ***m* = 0x09 :**

Sends an octet of between 0 and 255 = value measured on the temperature converter = AD measure

Formulas: RTH (Kohm) = 100 / ((255 / AD measure) - 1)
Temp (°C) = (3950 / (ln (RTH / 30) + 13.255)) - 273

Example: AD measure = 60 **è** RTH= 30.769ko **è** Temp = 24.43°C
AD measure = 27 **è** RTH=11.842ko **è** Temp = 47.47°C

TRANSMIT STATUS (PAPER SENSOR STATUS, DRAWER KICK OUT STATUS, FLASH MEMORY USER SECTOR STATUS).

Synopsis: Transmit status (Paper sensor Status, Drawer Kick out Status, Flash memory User Sector status).

ASCII	GS	r	*n*
Hexadecimal	**1D**	**72**	**n**
Decimal	29	114	*n*

Operand: n = Mode selection

Value of n
- 1, 49 = Paper sensor Status
- 2, 50 = Drawer Kick out Status
- 4, 52 = Flash memory User Sector status

Returns: 1 Byte. The status bytes to be transmitted are described in the following tables:

Description: Transmits the status specified by *n*.
This is a batch mode command which transmits the response after all prior data in the receive buffer has been processed.
There may be a time lag between the printer receiving this command and transmitting the response, depending on the receive buffer status.

Note: If Paper Low sensor Option disabled **è** Paper low status is not relevant.
When *n* is out of the specified range, the command is ignored.

Paper sensor Status (*n* = 1 or *n* = 49)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	Off	00	0	Paper Low : Paper Present (if paper low sensor enabled)
	On	01	1	Paper Low : Paper exhausted (if paper low sensor enabled)
1	Off	00	0	Cover Closed
	On	02	2	Cover Open
2	Off	00	0	Paper End : Paper Present
	On	04	4	Paper End : Paper absent
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to off.

Drawer Kick out Status (*n* = 2 or *n* = 50)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	Off	00	0	Pin Low
	On	01	1	Pin High
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to off.

Flash memory User Sector Status (*n* = 4 or *n* = 52)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	Off	00	0	Not Used. Fixed to off
3	Off	00	0	Logo(s) defined.
	On	08	8	No logo defined.
4	Off	00	0	Not used. Fixed to off.
5	Off	00	0	No user-defined characters written to flash.
	On	20	32	User-defined characters written to flash
6	Off	00	0	Not used. Fixed to off.
7	-	-	-	Undefined.

SEND PRINTER SOFTWARE VERSION

Synopsis: Send printer software version.

ASCII	US	V
Hexadecimal	**1F**	**56**
Decimal	31	86

Return : 8 bytes ASCII

Description: The printer returns 8 bytes containing the boot and flash software version.
The first 4 bytes returned are an ASCII string for the boot version.
The second 4 bytes are an ASCII string for the flash version.

Example: The printer returns 1.251.03
This means the boot firmware version is 1.25 and the flash firmware version is 1.03

RETURN MEMORY ALLOCATION STATUS

Synopsis:	Reply flash memory allocation in user section.		
ASCII	US	v	*n*
Hexadecimal	**1F**	**77**	**n**
Decimal	31	119	*n*

Operand:

n	= Status select
1	Reply the amount of Flash memory available in user section.
2	Reply the amount of Flash memory available in User Download font section (Easy Font).

Limit

Dec:	n =1	n =2
Hex:	n= 01	n= 02

Description: Returns the amount of Flash memory available in user sections.

Note: Returns the number of bytes available as a zero terminated ASCII string.
Each digit is coded in decimal.

7.12 Real time commands

The Real Time commands provide an application interface to the printer even when the printer is not handling other commands.

Real Time Status Transmission: DLE (Hex 10) Sequence

Real Time Request to Printer: DLE (Hex 10) Sequence

Real Time Printer Status Transmission

The original Printer Status commands, Transmit Printer Status (Hex 1B 76, ASCII ESC v) are placed in the printer's data buffer as they are received and handled by the firmware in the order in which they were received. If the paper exhausts while printing data that was in the buffer ahead of the status command, the printer goes busy at the communication interface and suspends processing the data in the buffer until paper is reloaded. This is true for all error conditions: knife home error, thermal print head overheating, etc. In addition, there is no way to restart the printer after a paper jam or other error.

The Real Time commands are provided to overcome these restrictions.

7.12.1 Rules for Using Real Time Commands

RS232 interface
Three situations must be understood when using real time commands:

1) The printer executes the Real Time command upon receiving it and will transmit status regardless of the condition of the host being ready to receive or not.

2) The printer transmits status whenever it recognizes a Real Time Status Transmission command sequence, even if that sequence happens to occur naturally within the data of another command, such as graphics data.
In this case the sequence will be processed both ways: as a real time command and as the graphics data it is intended to be when the graphics command is executed from the buffer. The result is that the host might receive status messages it has not requested.

3) If the printer is in error condition, meaning that the communication interface is likely to be busy, the host must be able to send the real time commands regardless of this busy state at the interface. Otherwise those commands wouldn't be received and processed.

USB interface
Real time commands are sent on a specific endpoint 0x01 (INTERRUPT OUT), so that those commands are not mixed with the main command stream carried on endpoint 0x02 (BULK OUT).

Responses to real times commands are transmitted back to the host on endpoint 0x82 (BULK IN).

7.12.2 Moving Data Through the Buffer

Applications should not let the buffer fill up with Real Time commands when the printer is busy at the communication interface. A busy condition can be determined by bit 3 of the response to DLE EOT 1. Other responses to DLE EOT n can determine the reason for a particular busy condition.

Although the printer responds to Real Time commands when it is busy, it will place them into the buffer behind any other data there, and flush them out in the order in which they were received. When the printer is busy due simply to buffer full (that is, it can't print data as fast as it can receive it), then data continues to be processed out of the buffer at approximately print speed and the Real Time commands will eventually get flushed out.

When the printer is busy due to an error condition, then data stops being processed of the buffer until the condition clears one way or another. In either case, but more quickly in the case of an error condition, the buffer can fill with Real Time commands.

To guard against this situation, the application must determine the cause of a busy condition and take appropriate action or pace the Real Time commands to avoid filling the buffer. There is a minimum of 256 bytes available in the printer's buffer when it goes busy.

7.12.3 Busy Line and Fault Conditions

If the printer is in error condition (cover is open, paper is exhausted…), the printer will go busy immediately. Then it will stay busy and stop processing data out of the receive buffer until the condition clears. It will respond to the Real Time commands as described below.

REAL TIME STATUS TRANSMISSION

Synopsis:	Real time status transmission.		
ASCII	DLE	EOT	n
Hexadecimal	**10**	**04**	**n**
Decimal	16	4	n

Operand: n = DLE Sequence

Value of n:
1 = Transmit printer status
2 = Transmit communication interface busy status
3 = Transmit error status
4 = Transmit receipt paper status

Description: Transmits the selected one byte printer status specified by *n* in Real Time according to the following parameters.

Exception: The command is ignored if *n* is out of range.

Related Information :

n = 1 = Transmit Printer Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Low	00	0	Switch drawer signal low.
	High	04	4	Switch drawer signal high.
3	Off	00	0	Not busy at the communication interface.
	On	08	8	Printer is Busy at the communication interface.
4	On	10	16	Fixed to On.
5	On	40	32	Data received in buffer
	Off	00	0	Buffer empty
6	-	00	0	Undefined.
7	Off	00	0	Fixed to Off.

n = 2 = Transmit communication interface Busy Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Off	00	0	Cover closed.
	On	04	4	Cover open.
3	Off	00	0	Paper feed button is not pressed.
	On	08	8	Paper feed button is pressed.
4	On	10	16	Fixed to On.
5	Off	00	0	Printing not stopped due to paper condition.
	On	20	32	Printing stopped due to paper condition.
6	Off	00	0	No error condition.
	On	40	64	Error condition exists in the printer.
7	Off	00	0	Fixed to Off.

n = 3 = Transmit Error Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Off	00	0	Fixed to Off.
3	Off	00	0	No knife error.
	On	08	8	Knife error occurred.
4	On	10	16	Fixed to On.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	Thermal print head temp. and power supply voltage are in range.
	On	40	64	Thermal print head temp. or power supply voltage are out of range.
7	Off	00	0	Fixed to Off

n = 4 = Transmit Receipt Paper Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	Paper adequate
	On	04	4	Paper low (if paper low sensor enabled)
3	Off	00	0	Paper adequate
	On	08	8	Paper low (if paper low sensor enabled)
4	On	10	16	Fixed to On
5	Off	00	0	Paper present
	On	20	32	Paper exhausted
6	Off	00	0	Paper present
	On	40	64	Paper exhausted
7	Off	00	0	Fixed to Off

(If paper low sensor disabled **è** paper low = paper empty)

REAL TIME RECOVERY FROM FAULT

Synopsis: Real time recovery from fault.

ASCII	DLE	ENQ	n
Hexadecimal	**10**	**05**	**n**
Decimal	16	5	n

Operand: n = Recovery mode

Limit

Dec: n = 2

Hex: n = 02

Description: When the printer is an error status, this command clearing the data in the receive buffer and print buffer.

Notes: This command will attempt recovery from any fault that prevents printing including jams and paper out.

Recovering from a print head over temperature condition is only accomplished by waiting until the print head has returned to its operating temperature range.

This command will be ignored until manual intervention has occurred to clear the fault condition. The indication of manual intervention for clearing paper out, paper jams, cutter fault consists of opening and closing the clamshell.

7.13 Bar code commands

These commands format and print bar codes.

SELECT PRINTING POSITION OF HRI CHARACTERS

Synopsis:	Select printing position for HRI characters.		
ASCII	GS	H	*n*
Hexadecimal	**1D**	**48**	**n**
Decimal	29	72	*n*

Operand:	**n**	**= Printing position**
	0	= Not printed
	1	= Above the bar code
	2	= Below the bar code
	3	= Both above and below the bar code
Default:	0	

Description: Prints HRI (Human Readable Interface) characters above or below the bar code.

SELECT BAR CODE HEIGHT

Synopsis:	Select bar code height.		
ASCII	GS	h	*n*
Hexadecimal	**1D**	**68**	**n**
Decimal	29	104	*n*

Operand:	n	= Number of dots
Limits:		$1 \leq n \leq 255$
Default		= 216 dots

Description: Sets the bar code height to *n* dots or *n*/203 inch (*n*/8 mm).

PRINT BAR CODE FIRST VARIATION
PRINT BAR CODE SECOND VARIATION

Synopsis: Selects the bar code type and prints a bar code for the ASCII characters entered.

First Variation

ASCII	GS	k	*m*	*d1…dk*	*NUL*
Hexadecimal	**1D**	**6B**	m	**d1…dk**	**00**
Decimal	29	107	*m*	*d1…dk*	*0*

Second Variation

ASCII	GS	k	*m*	*n*	*d1…dk*
Hexadecimal	**1D**	**6B**	m	**n**	**d1…dk**
Decimal	29	107	*m*	*n*	*d1…dk*

(0 = End of command)

Operands: See tables below.

Description: There are two variations to this command.
The first variation uses a NULL character to terminate the string; the second uses a length byte at the beginning of the string to compensate for the Code 128 bar code that can accept a NULL character as part of the data.
With the second variation the length of byte is specified at the beginning of the string.
Bar codes can be aligned left, center, or right using the Align Positions command (1B 61).
The check digit is calculated for UPC and JAN (EAN) codes if it is not sent from the host computer.
Six-character zero-suppressed UPC-E tags are generated from full 11 or 12 characters sent from the host computer according to standard UPC-E rules.
Start/Stop characters are added for Code 39 if they are not included.

Exceptions: The command is only valid at the beginning of a line.
Illegal data cancels the command.
If the width of the bar code exceeds one line, the bar code is not printed.

First Variation: Data string terminated with NULL Character

Description: The value of *m* selects the bar code system as described in the table.
The variable *d* indicates the character code to be encoded into the specified bar code system. See the table.

Exceptions: If character code *d* cannot be encoded, the printer prints the bar code data processed so far, and the following data is treated as normal data.

m	Bar Code	d	n, Length
0	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12
1	UPC-E	48- 57	Fixed Length: 11, 12
2	JAN13 (EAN)	48- 57	Fixed Length: 12, 13
3	JAN8 (EAN)	48- 57	Fixed Length: 7,8
4	Code 39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) d1 = dk = 42 (start/stop code is supplied by printer if necessary)	Variable Length
5	Interleaved 2 of 5	48- 57	Variable Length (Even Number)

Second Variation: Length of Byte Specified at Beginning of String

Description: The value of *m* selects the bar code system as described in the table.

The variable *d* indicates the character code to be encoded into the specified bar code system. See the table.

Exceptions: If character code *d* cannot be encoded, the printer prints the bar code data processed so far, and the following data is treated as normal data.

m	Bar Code	d	n, Length
65	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12
66	UPC-E	48- 57	Fixed Length: 11, 12
67	JAN13 (EAN)	48- 57	Fixed Length: 12, 13
68	JAN8 (EAN)	48- 57	Fixed Length: 7, 8
69	CODE39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) *d1* = *dk* = 42 (start/stop code is supplied by printer if necessary)	Variable
70	Interleaved 2 of 5 (ITF)	48- 57	Variable (Even Number)
73	Code 128	0-105 *d1* = 103-105 (must be a Start code) *d2* = 0-102 (data bytes) (Stop code is provided by the printer)	Variable

SELECT BAR CODE WIDTH

Synopsis: Select bar code width.

ASCII	GS	w	*n*
Hexadecimal	**1D**	**77**	**n**
Decimal	29	119	*n*

Operand: n

Range 1 ,2, 3, 4, 5,6

Default 3

Formulas *n*/203 inch (*n*/8 mm).

Description: Sets the bar code module to *n*/203 inch (*n*/8 mm).

7.14 Flash firmware download commands

These commands are used to load firmware into the printer.

There are three ways to enter the download mode:

1. Powering the printer up with cover open and paper feed button held down.
2. While the printer is running normally, send the command, “Switch to Flash Download Mode (1B 5B 7D)” to leave normal operation and enter the download mode.
3. If the Flash if found corrupted during Level 0 diagnostics the download mode is automatically entered after the printer has reset.

The printer never goes directly from the download mode to normal printer operation. To return to normal printer operation either the operator must turn the power off and then on to reboot or the application must send a command to cancel download mode and reboot.

When each flash download command is received, the printer returns either ACK or NAK to the host computer when each command is received:

ACK (hexadecimal 06) Sent when the printer has received a host transmission and has completed the request successfully.
NAK (hexadecimal 15) Sent when a request is unsuccessful.

The commands are listed in numerical order according to their hexadecimal codes.
Each command is described and the hexadecimal, decimal, and ASCII codes are listed.
Communicates to the printer information downloaded from applications.
Data is downloaded to flash memory to query the state of the firmware, calculate the firmware CRC and other functions.

7.14.1 Firmware Download Sequence:

By providing a set of low-level commands, great freedom of implementation is given to customer application to customize the sequence to match its specific requirements.

Following is the description of a typical Firmware download sequence.
Only the main steps are mentioned.
Error checking and error recovery is not described:

1) Switch to Flash Download Mode

2) Check Flash Memory Size

3) Erase all Flash Memory sectors, except Boot Sector

4) Download Code to Active Flash Sector
   4.1) Select Flash memory sector #n (each sector contains 64kbytes)
      4.1.1) Program segment of N bytes
      4.1.2) if more segments, loop back to 4.1.1)
   4.2) if more sectors to program, loop back to 4.1)

5) Check Flash CRC

6) Reboot Printer

7.14.2 Commands:

SWITCH TO FLASH DOWNLOAD MODE

Synopsis:	Switch to flash download mode.		
ASCII	ESC	[	}
Hexadecimal	**1B**	**5B**	**7D**
Decimal	27	91	125

Description: Puts the printer in flash download mode in preparation to receive commands controlling the downloading o objects into flash memory.
When this command is received, the printer leaves normal operation and can no longer print transactions until the Reboot the Printer command (1D FF) is received or the printer is rebooted.

Note: This command does not affect the current communication parameters.

REQUEST FLASH MEMORY SIZE

Synopsis:	Request flash memory Size.	
ASCII	GS	SOH
Hexadecimal	**1D**	**01**
Decimal	29	1

Return : 1 bytes

Description: Returns the size of the flash used.
There may be 2 sectors (64K each) in flash memory.
This command assures that the firmware to be downloaded is the appropriate size for flash memory.
The returned value corresponds to the highest sector number that can be accepted by the Select Sector to Download (1D 02 *nn*) command : 1 = 128 Kbytes Flash

SELECT FLASH MEMORY SECTOR TO DOWNLOAD

Synopsis:	Select flash memory sector to download.		
ASCII	GS	STX	nn
Hexadecimal	**1D**	**02**	**nn**
Decimal	29	2	nn
Value and range	**nn :**	0-1	Sector number

Description: Selects the flash sector (nn) for which the next download operation applies.
The values of the possible sector are restricted, depending upon the flash part type. The printer transmits an ACK if the sector number is acceptable or an NAK if the sector number is not acceptable. Sector numbers start at 0.

Exceptions: Available only in download mode.

GET FLASH FIRMWARE CRC STATUS

Synopsis:	Get flash firmware Sector CRC.	
ASCII	GS	ACK
Hexadecimal	**1D**	**06**
Decimal	29	6

Returns:	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: Causes the printer to calculate the CRC for the Flash firmware code space and transmits the result.
This is performed normally after downloading completely a new firmware to verify that the downloaded firmware is valid.
The printer transmits ACK if the calculated CRC is correct; NAK if the CRC is incorrect

RETURN BOOT SECTOR CRC

Synopsis:	Return Boot Sector CRC.	
ASCII	GS	BEL
Hexadecimal	**1D**	**07**
Decimal	29	7

Returns: 3 byte
Values: ACK <low byte> <high byte>

Description: Returns the CRC calculated over the boot sector code space.

ERASE ALL FLASH CONTENTS EXCEPT BOOT SECTOR

Synopsis:	Erase all flash contents except boot sector.	
ASCII	GS	SO
Hexadecimal	**1D**	**0E**
Decimal	29	14

Return value :	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: Causes the entire flash memory to be erased.
The printer returns ACK if the command is successful; NAK if it is unsuccessful.

Note: Available only in download mode.

RETURN MAIN PROGRAM FLASH CRC

Synopsis:	Return main program flash CRC.	
ASCII	GS	SI
Hexadecimal	**1D**	**0F**
Decimal	29	15

Returns: 3 bytes
Values: ACK <low byte> <high byte>

Note: Returns the CRC calculated over the flash firmware code space.

ERASE SELECTED FLASH SECTOR

Synopsis: Erase selected flash sector.

ASCII	GS	DLE	n
Hexadecimal	**1D**	**10**	**n**
Decimal	29	16	n

Value and range **n :** 0-1 Sector Number

Description: Erases the previously selected sector.

The printer transmits ACK when the sector has been erased. If the previous sector is not successfully erased, or if no sector was selected, the printer transmits NAK.

Notes: Available only in download mode.

DOWNLOAD TO ACTIVE FLASH SECTOR

Synopsis: Erase selected flash sector.

ASCII	GS	DC1	al	ah	cl	ch	d1…dn
Hexadecimal	**1D**	**11**	**al**	**ah**	**cl**	**ch**	**d1…dn**
Decimal	29	17	al	ah	cl	ch	d1…dn

Value of :

al	= Low byte of address.
ah	= High byte of address.
cl	= Low byte of the count.
ch	= high byte of the count.
d	= Data bytes , from 1 to n.

Formulas:

Address start = ((ah* 256) + al)

Count = n = ((ch * 256) + cl)

Limits: Address start + Count ≤ 10000 (Hex)

n number of data bytes	Range of address (al ah)	Range of Count (cl ch)
((ch * 256) + cl)	0000 - FFFF (Hex)	0001 - FFFF (Hex)

Description: Contains a start address (ah x 256 + al) and count (ch x 256 + cl) of binary bytes to load into the selected sector, followed by that many bytes. The start address is relative to the start of the sector. Addresses run from 0 to xxK.

The printer may return one of several responses. ACK means that the data was written correctly and the host should transmit the next block. NAK means that, for some reason, the data was not written correctly. This could mean that communications failed or that the write to flash failed. The alternatives seem to be to retry the block or halt loading and assume a hardware failure.

Notes: Available only in download mode.

ERASE BOOT SECTOR, DOWNLOAD NEW CODE

Synopsis:	Erase boot sector and download new boot code.		
ASCII	US	SOH	*d1…dn*
Hexadecimal	**1F**	**01**	**d1…dn**
Decimal	31	1	*d1…dn*

Description: Verify new code and Download new boot code.
n= 8192

7.15 Peripheral control commands

7.15.1 Drawer Kick Out or External Command

See the hardware characteristics definitions (max current, …)

GENERATE PULSE

Synopsis:	Generate pulse for CDKO				
ASCII	ESC	p	m	n1	n2
Hexadecimal	**1B**	**70**	**m**	**n1**	**n2**
Decimal	27	112	m	n1	n2

Operands:

m	Selected connector pin
n1	Ton = (n1 * 2ms) Is the on time of the pulse
n2	Toff = (n2 * 2ms) Is the off time of the pulse

Limits:

m = 0 , 1 , 48 , 49 see table below

0 < n1 ≤ n2 ≤ 255

If n2 < n1 **è** Toff = (n1 * 2ms)

Description: Generates a pulse Ton, Toff on pin 2 of the drawer kick out connector in accordance with the table below.

7.15.2 Generate Tone

GENERATE TONE

Synopsis:	Generate tone	
ASCII	ESC	SP
Hexadecimal	**1B**	**07**
Decimal	27	07

Description: Generates a single beep.

Note: This command is only processed at the beginning of a new printing line.

7.15.3 Enable/Disable Panel Buttons

ENABLE/DISABLE PANEL BUTTONS

Synopsis:	Enable/Disable Panel Buttons			
ASCII	ESC	c	5	N
Hexadecimal	**1B**	**63**	**35**	**N**
Decimal	27	99	53	n
Operand:	n			
Value Hex	00	Disabled		
	01	Enabled (Default)		

Description: Enables or disables the paper feed button to prevent accidental feeding of paper. This setting is volatile and lost upon printer reset.

Note:

7.16 Configuration commands

The following commands are designed to modify the controller configuration and store the new settings in NVRAM. Those commands are typically used in factory environment, when assembling the controller board with the mechanism.
Note that the new settings become active after the printer is rebooted.

7.16.1 Mechanism

STORE SELECTED SENSOR THRESHOLD.

Synopsis:	Store selected sensor threshold			
ASCII	GS	s	***m***	***n***
Hexadecimal	1D	73	m	n
Decimal	29	115	***m***	***n***

Operand:	m	= Mode selection	*n*	= Value
Value of n	01	= Set Paper Out Threshold	*0-255*	Default value = *204*
	06	= Set Low Paper Threshold	0-255	Default value = *102*

Returns:

Description: Set the threshold for the paper out and low paper sensors

Note:

SET KNIFE OPTION

Synopsis:	Set knife option (NVRAM).			
ASCII	US	ETX	*STX*	*n*
Hexadecimal	**1F**	**03**	**02**	**n**
Decimal	31	3	*2*	*n*

Operand:	n	= mode selection
Value Decimal	0	Disabled
	1	Enabled
	2	Enabled , low noise
Default	0	

Limit: Dec : $0 \le n \le 2$
Hex: $00 \le n \le 02$

Description: This command will store the knife option in non-volatile memory.
Note: This command must be followed by a reset.

SET PAPER WIDTH

Synopsis:	Set paper width parameter (NVRAM).			
ASCII	US	ETX	*BS*	*n*
Hexadecimal	**1F**	**03**	**08**	**n**
Decimal	31	3	*8*	*n*

Operand:	n	= width selection
Value Decimal	0	80.0 mm
	1	82.5 mm
Default:	0	

Limit:	Dec:	$0 \le n \le 1$
	Hex:	$00 \le n \le 01$

Description: This command will store the paper width setting in non-volatile memory (NVRAM).
Note: This command must be followed by a reset.

SET PARTIAL CUT DISTANCE

Synopsis:	Set partial cut distance for MH/MCTP mechanism (NVRAM).			
ASCII	US	ETX	*LF*	*n*
Hexadecimal	**1F**	**03**	**0A**	**n**
Decimal	31	3	*10*	*n*

Operand:	n	= Value for **MH/MCTP** mechanism **:**
Value Decimal	0	0 steps
	1	8 steps
	2	16 steps (Default)
	3	24 steps
	4	32 steps

Description: Allows regulating the partial cut.
This command will store the cut distance setting in non-volatile memory (NVRAM).

Note: This command must be followed by a reset.

SET PRE-HEATING MODE

Synopsis:	Set Print head pre – Heating mode (NVRAM).			
ASCII	US	ETX	*VT*	*n*
Hexadecimal	**1F**	**03**	**0B**	**n**
Decimal	31	3	*11*	*n*

Operand:	n	= Mode selection
Value Decimal	0	Disabled
	1	Enabled
Default	0	

Limit: Dec: $0 \le n \le 1$
Hex: $00 \le n \le 01$

Description: This command will store the print-head pre-heating option in non-volatile memory (NVRAM).

Note: When this mode is enabled, the controller monitors the print-head temperature and keeps it above 19-24°C.
If the temperature is around 0°C and the preheating is not active, the preheating will be automatically start until the temperature will be around 19-24°C. After the preheating will become not active again.
This command must be followed by a reset.

SET PRINT DENSITY

Synopsis:	Set print density (NVRAM).					
ASCII	US	VT	*N*	*R*	*J*	*n*
Hexadecimal	**1F**	**0B**	**4E**	**52**	**4A**	**n**
Decimal	31	11	*78*	*82*	*74*	*n*

Operand: n = Percentage of the nominal heating time value

Default 100%

Limit: Dec: $80 \leq n \leq 120$

Hex: $50 \leq n \leq 78$

Description: Set the print density (energy applied to paper) in percent relative to nominal energy.
This command will store the Value in non-volatile memory (NVRAM).

Note : This command must be followed by a reset.

WARNINGS!!

- **Choose a print density setting no higher than necessary to achieve acceptable print density.**
- **Failure to observe this rule may result in a printer service call.**
- **Failure to observe this rule may void the printer warranty.**
- **Consult your Axiohm technical support specialist if you have questions.**

SET BUZZER OPTION

Synopsis:	Set buzzer option (NVRAM).			
ASCII	US	ETX	¿	*n*
Hexadecimal	**1F**	**03**	**A8**	**n**
Decimal	31	3	*128*	*n*

Operand: n

Value Hex

00	Disabled
01	Enabled (Default)

Description: Set buzzer option

Note: When buzzer option is disabled, the buzzer is operational only when entering in Boot mode.
This command must be followed by a reset.

7.16.2 Communication (interface)

- See also § Specific Boot Commands.

SET COMMUNICATION INTERFACE PARAMETERS

Synopsis: Set communication interface parameters (NVRAM).

ASCII	US	STX	*n1*	*n2*	*n3*	*n4*	*n5*	*n6*
Hexadecimal	**1F**	**02**	**n1**	**n2**	**n3**	**n4**	**n5**	**n6**
Decimal	31	2	*n1*	*n2*	*n3*	*n4*	*n5*	*n6*

Operands:

	n1	Interface selection
	n2 – n6	Parameters
Default	(*)	RS232 , 115200, n , 8 , 1

Values (Hex)

n1 :	-	= x00 = Interface **è** RS232	(*)
n2 :	Bit [0..2]	= x03 = Baud rate **è** 9600	
“	“	= x04 = Baud rate **è** 19200	
“	“	= x05 = Baud rate **è** 38400	
“	“	= x06 = Baud rate **è** 57600	
“	“	= x07 = Baud rate **è** 115200	(*)
“	Bit 4	= x00 = Number of stop bits **è** 1 (*)	
“	“	= x08 = Number of stop bits **è** 2	
“	Bit 5	= x00 = Number of Data bits **è** 8	
n3 :	-	= x00 = Parity **è** Odd	
“	-	= x01 = Parity **è** Even	
n4 :	-	= x00 = Parity Mode **è** No parity (*)	
“	-	= x01 = Parity Mode **è** Enable parity	
n5 :	-	= x00 = Handshaking **è** Xon / Xoff	
“	-	= x01 = Handshaking **è** Dtr / Dsr (*)	
n6 :	-	= x00 = Error processing **è** Ignore	(*)
“	-	= x00 = Error processing **è** Print ?P = Parity Error. ?F = Framing Error. ?O = Over run Error.	

Description: This command will store the communication options in non-volatile memory. (NVRAM)

Notes: **If one of the RS232 configuration parameter is erroneous, the code is ignored.**

1) **This command is processed only in boot mode. If the printer is running in normal mode, send first command “switch to Boot Mode” (1B 5B 7D).**
2) **This command must be followed by “Printer Reset” command (1D FF).**

7.16.3 Print Options

SET DEMO MODE

Synopsis:	Set demo option (NVRAM).			
ASCII	US	ETX	*STX*	*n*
Hexadecimal	**1F**	**03**	**00**	**n**
Decimal	31	3	*0*	*n*

Operand:	n	= mode selection
Value Decimal	0	Disabled
	3	Enabled
Default	0	

Limit:	Dec :	$0 \le n \le 2$
	Hex:	$00 \le n \le 01$

Description: This command will store the knife option in non-volatile memory.

Note: This command must be followed by a reset.

SET DEFAULT CODE PAGE

Synopsis:	Set default code page resident font (NVRAM).			
ASCII	US	ETX	*Ç*	*n*
Hexadecimal	**1F**	**03**	**80**	**n**
Decimal	31	3	*128*	*n*

Operand:	n	= code page selection
Value Decimal	0	437 : US
	6	858 default
Value Hex	00	437 : US
	06	858 default

Description: This command will store the default code page in non-volatile memory (NVRAM).

Note: The default code page selects which code page will be initially used by the printer until it is changed using the “ESC t” command.

This command must be followed by a reset.

7.16.4 Default mode

RESET NVRAM PARAMETERS

Synopsis:	Reset NVRAM parameters.					
ASCII	US	CR	*C*	*L*	*E*	*n*
Hexadecimal	**1F**	**0D**	**43**	**4C**	**45**	**n**
Decimal	31	13	*67*	*76*	*69*	*n*

Operand: n = Security byte

Limit
Dec: n = 0
Hex: n = 00

Description: This command will reset the non-volatile memory configuration items to their default values. Followed by reboot printer.

Note : This command is processed only in boot mode.
If the printer is running in normal mode, send first command “switch to Boot Mode” (1B 5B 7D).

7.17 Other information

7.17.1 Paper feed button Commands

- In standard mode, the paper feed button is not enabled when an error is occurred (excepts for the voltage error and temperature error, in this case the paper feed button is still enabled)
- During a knife error, the user can push the paper feed button to initialise the knife in is start position «Switch closed else led is flashing mode ». Two attempts are allowed to initialise the knife otherwise the user can utilise a screwdriver (remove the paper generating the trouble)
- Following a reset or a switch on of the printer, if the paper feed button is pushed during the initialisation of the printer, a diagnostic ticket is printed in any mode.

7.17.2 Specific Boot Commands

- To enter in the BOOT mode, plug off the printer then push on the paper feed button (during 8 seconds) and plug in the printer again. The led will blink quickly and the buzzer will ring twice.
- In BOOT mode, push on the paper feed button during 10 seconds to put the RS232 communication parameters in standards values 115200 n 8 1.

7.17.3 Error Buffer Full

- If the receipt buffer is full with no executable code, the receipt buffer will empty and the following ticket will print. (in that way the printer will not block)

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Error Buffer Full: Contains no
Printable data è Buffer cleared
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

8 TROUBLESHOOTING

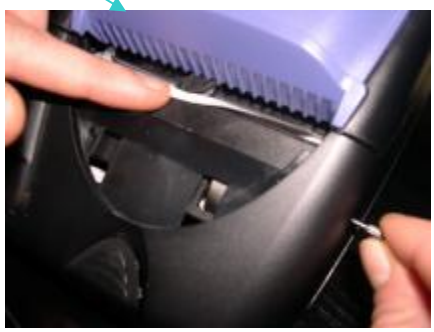
Axiohm printers are simple and generally trouble-free, but from time to time minor problems may occur. Follow these procedures to determine the cause and resolution of any problems the printer may be having. If the procedures in this section do not correct the problem, contact the technical support department to have more information.

8.1 Light indicator

When light is on continuously, the printer is ready to operate.
When light is flashing, an error occurs.

8.2 Problems & Solutions

	Problems	Solutions
PRINTER PROBLEMS	Printer does not function when turned on.	Check that printer cables are properly connected on both ends. Check that the host or power supply is getting power.
	Printer LED is off.	Check the power-supply and cable connections.
	Printer LED is continuously on but printer does not operate.	Check if the interface cable is properly connected. Check communication parameters.
PRINTER LED DIAGNOSTIC	Printer LED is flashing.	Check that the cover is properly closed; if not close it. Open the cover and make sure there is paper left in the printer; if not, remove the paper roll core, place a new paper roll as indicated in the chapter "Loading paper". Open the cover and make sure there is no paper jam. In case of paper jam (Cf. Paper jam in the cutting problem part).
	LED, slow continuous flashing (1 flash / sec or more)	If out of paper: put in a new paper roll. If cover is off: put the cover on. If voltages are out of range: contact your authorized service representative. If print head is too hot: turn the printer off (*unplug*). If knife is unable to home: contact your authorized service representative.
	Flashing LED in various combinations.	These indicate serious problems. Contact your authorized service representative. Download Boot and Main Program.
	Fast continuous flashing of LED: - Main Program CRC Test Failure → <u>- Manual cutter</u>: (no mobile blade) You are in auto cutter mode →	Cf. problem Flashing LED in various combinations. Open the cover and refer to the chapter "Set knife option" to disable the knife. If the problem continues, please contact your authorized service representative.

CUTTING PROBLEMS	Paper Jam (cutter Blade not in correct position). Maybe paper used is too thick, intrusion of external object	In case of paper jam, remove the front cover (see picture), - If paper is in this area, clean it. - Check the cutter blade position (must be on the left side of the cutter), - if the cutter blade is not fully on the left side: switch “on” the printer to recover the stand by position automatically. If it doesn’t work properly, switched “off” the printer and manually adjust this position by using the Axiohm screw driver (through the hole on the right side of the printer – see picture). This mini screw driver delivered with the printer must be used for this operation.  
	The ticket is out of the printer, but the cutter does not cut.	Maybe the cut command is not used correctly: Review the User Manual command sets. Maybe faulty cutter: Contact your authorized service representative.
	Total cuts instead of partial cuts (un-adapted partial cut setting).	Contact your authorized service representative.
PRINTING PROBLEMS	Print quality is deteriorating (print head may be getting dirty).	See next chapter “Cleaning your printer” .
	Colour stripe on the receipt (paper is low).	Change the paper.
	Receipt does not come out all the way.	Check if there is a paper jam: cf. to cutting problem.
	Printer starts to print, but stops while the receipt is being printed.	
	Print is light or spotty.	Maybe the paper roll is not correctly loaded: Check that the paper roll is properly loaded. Maybe the print head is dirty: Use recommended thermal receipt paper. See next chapter "Cleaning your printer". Maybe there are variations in paper: Increase print density in “Set Mechanism Options” of printer Configuration Menu as needed.
	Vertical column of print is missing (this indicates a serious problem with the printer electronics).	Contact your authorized service representative.
	One side of receipt is missing (this indicates a serious problem with the printer electronics).	

9 CLEANING YOUR PRINTER

Depending on the environment in which the printer is used, it can accumulate dust. Therefore it is necessary to clean it periodically to maintain a good print quality. The cleaning period depends on the environment and the usage of the printer, but the print head should be cleaned at least once a year or up to one month in heavy duty applications.

Cleaning Instructions:

- Unplug the printer. **Never clean the head immediately after printing, the head may be hot.**
- Open the cover, clean the heating dots line of the head with a cotton stick containing a solvent alcohol (ethanol, methanol, or IPA) but **do not touch the print head with your fingers**!
- Allow the solvent to dry and close the cover.
- N.B **AXIOHM can provide cleaning kits Ref : CK80000A**