

# Manual ASTERON USB



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## 1. GENERAL SPECIFICATIONS

### 1.1. Features

Supported mechanism:	ASTERON 5.0V to 8.5V
Communication Interface s:	USB full speed (12Mb) 2Kb reception buffer
Standard Flash Memory Size :	384kb
Hardware Option Flash data Size :	1Mb
Amount of Flash Memory accessible for user storage:	Standard : 128Kb internal flash memory Option : 768Kb <sup>(4)</sup> internal flash memory
Standard Ram Memory Size:	64Kb ~25Kb User features mode.
Hardware Option Ram Memory Size :	96Kb <sup>(4)</sup>
Resident Character per Size (dot*dot):	<u>50.0mm</u> 16*24 24 columns 12.7 CPI 12*24 32 columns 16.9 CPI
Available Print modes	Standard / Double High / Double wide/ Upside Down / Underlines / Bold / Reverse / Graphics.
Resident character set:	Code Page : 437, 737, 850, 852, 858, 860, 862, 863, 865, 866, 1252, 1253, Katakana
User Fonts:	Yes 224 Max. <sup>(1)</sup>
Easy font support (Character User defined)	Standard: Singles fonts. <sup>(1)</sup> Option: Doubles fonts. <sup>(4)</sup>
Logo support :	Yes 256 Max. <sup>(1)</sup>
User data storage	Yes <sup>(1)</sup>
Bar code support :	Yes Code 39, 93, Code 128, EAN 128, UPC-A, UPC-E, JAN8 (EAN), JAN13 (EAN), Interleaved 2 of 5 (ITF)
Bar code Print modes :	Standard / Upside Down / Rotated
Paper Loading :	Clamshell.
Top of Form management Support :	No.
Label Length (mm) :	N/A
Out of paper :	Optical sensor
Cover Open sensor :	Switch sensor
Print resolution :	8 dots/mm
Speed : <sup>(2)</sup>	Up to 70 mm/second <sup>(3)</sup>
Media Separation :	Tear Bar
Additional :	Page Mode <sup>(1)</sup> Firmware update Linux, Windows 2000, XP, VISTA, SEVEN (32 bit). Configuration software commands
Drivers available :	
Human Interface :	

<sup>(1)</sup> Maximum Memory User Storage (Ram/Flash).

<sup>(2)</sup> Reaching and maintaining this print speed requires that data throughput of communication with host matches or exceeds print throughput; with the paper quality adapted and power supply.

<sup>(3)</sup> 70 mm/s at 9.0V - 65 mm/s at 8.0V - 40 mm/s under 6.0V

<sup>(4)</sup> Options. Contact your vendor.

## 1.2. Print Head Specifications

<b>Printing method</b>	Direct thermal line dot method
<b>Head Resolution</b>	8 dots / mm - 203 dpi
<b>Number of dots /line</b>	384
<b>Heater resistance</b>	$R_{\text{dot}} = 176 \text{ Ohm } \pm 4\%$ ; $R_{\text{Head}} = R_{\text{dot}} \pm 15\%$
<b>Printing width</b>	48 mm
<b>Head dot life</b>	$1 \times 10^8$ Pulses
<b>Head temperature detection</b>	By Thermistor
<b>Printing speed <sup>(1)</sup></b>	Up to 60 mm/second <sup>(3)</sup>
<b>Mechanical life time (abrasion)</b>	50 km

## 1.3. Interface Specifications

<b>Paper Width (mm)</b>	58
<b>Paper Roll Diameter (mm)</b>	50
<b>Paper thickness (µm)</b>	60 – 80
<b>Recommended papers</b>	JUJO AF50KSE3
	MaxStick MS 21460/B <sup>(4)</sup> (repositionable adhesive label)

<sup>(4)</sup> MaxStick Paper recommendations:

Temperature range = 0°C to 40°C

Paper path needs cleaning every 5 rolls (bucket and Printhead). Printhead and platen roller must be cleaned with a cotton stick containing an alcohol solvent (ethanol, methanol or IPA).

## 1.4. Interface Specifications

<b>Input Voltage</b>	1	Connector is a 4-pin JST ref: PAP-04V-S, or WST ref: P4-I10001
<b>USB</b>	1	Connecteur micro-USB type B.
<b>LED</b>	1	Blue Led. At the front of the printer
<b>BUTTONS</b>	1	Form Feed Button

## 1.5. Power Supply

<b>Input Voltage (VDC)</b>	5.0 <sup>(5)</sup> to 8.5V
<b>Input Current (A)</b>	1.0 <sup>(6)</sup> to xx

<sup>(5)</sup> Minimum voltage 4.5V with Low Voltage detector off.

<sup>(6)</sup> Minimum current with the "multi-heating mode". (See code 0x1D 0x25 ... and 0x1F 0x03 0xA5 ...).

## 1.6. Environnemental specifications

<b>Operating temperature :</b>	0°C <sup>(7)</sup> à 50 °C
<b>Humidity :</b>	65% to 85% RH (non-condensing)
<b>Storage temperature :</b>	-25°C à 60°C (Except for paper)
<b>Maximum humidity :</b>	85% RH (non-condensing)

<sup>(7)</sup> Minimum temperature 4.5V is +10°C.

### 1.7. Reliability

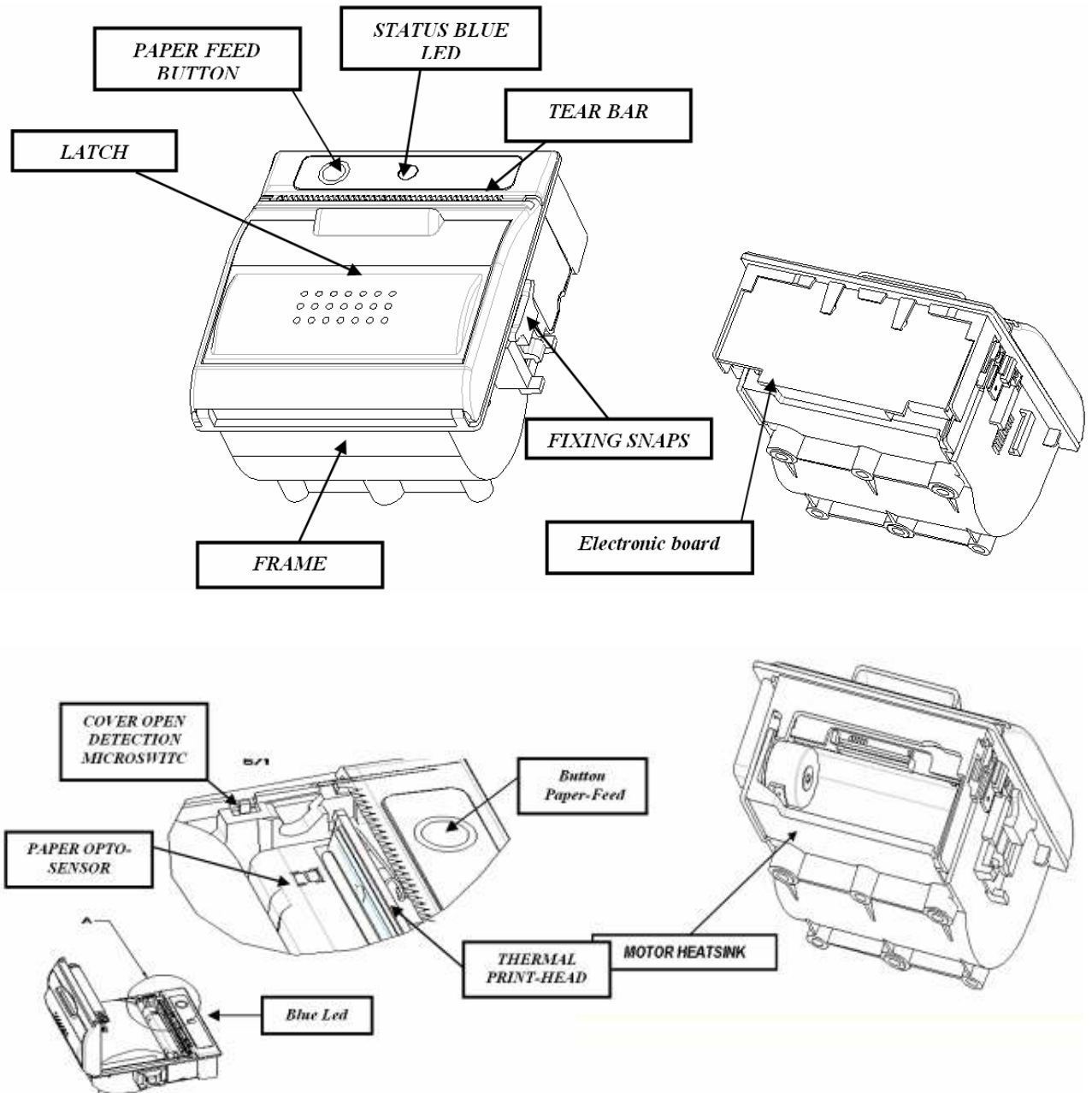
Reliability MTBF	250 000h
------------------	----------

### 1.8. Compliance to legal approval ( EMI, ESS, CE and FCC)

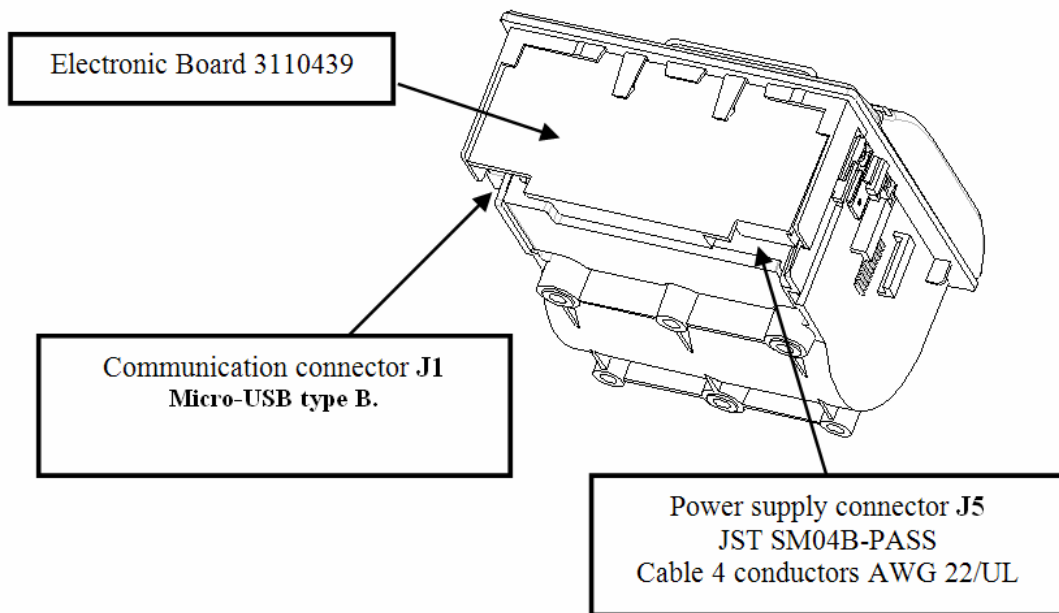
Regulation For Printer	
ROHS	Yes

## 2. MECHANICAL SPECIFICATIONS

### 2.1. General Views



### 3. CONNECTORS SPECIFICATION



- ELECTRONIC BOARD TOP VIEW -



#### 3.1. Power supply Connector J5:

The following illustration shows the power cable connector **J5** and pin assignments.  
The power cable connector is a 4-pin JST ref PAP-04V-S, or WST ref P4-I10001.  
Contact reference: JST SPHD-001T-P05

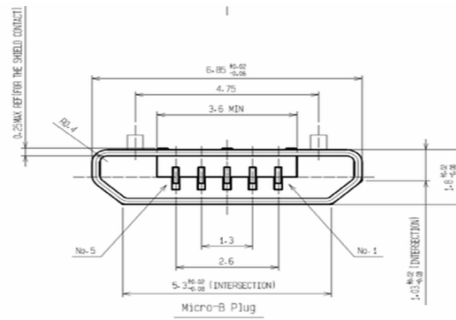
- Pin 1: GND
- Pin 2: GND
- Pin 3: VCH
- Pin 4: VCH

**Nota:** Power supply cable (delivered with printers): length: 400 ± 10 mm and no connector on one side.

#### 3.2. USB Connector J1:

Axiom's implementation of USB complies with "Universal Serial Bus Specification" revision 2.0  
 The maximum recommended cable length is 2 meters.

- Pin 1: Power VUSB
- Pin 2: Data D-
- Pin 3: Data D+
- Pin 4: No Connected
- Pin 5: GND



**Nota: Refer to USB specification rev 2.0 for more information.**

## 4. COMMUNICATION USB INTERFACES

Axiom's implementation of USB complies with "Universal Serial Bus Specification" revision 2.0

### 4.1. Capabilities

ASTERON is a device only, and doesn't provide hub capabilities.

The maximum recommended cable length is 2 meters.

Low Speed (1,5Mbits/sec) and full speed communications (12Mbits/sec) are supported.

### 4.2. Interface Configuration

Two operating modes are possible. Selection is made by sending configuration command.

#### 4.2.1. Four End Points Mode

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

Number	Type	Direction	Size	During	Description
00	Control	IN / OUT	16	-	Control end point (Default End Point).
01	Interrupt	OUT	8	-	Real time commands from Host to Printer.
81	Interrupt	IN	8	-	Real time reply from Printer to Host.
03	Bulk	OUT	64	-	For transmission of all printable data and commands from host to printer.
82	Bulk	IN	64	-	For return of all synchronous data, status or other types of information except unsolicited status mode messages, from printer to host.

#### 4.2.2. Three End Points Mode

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

Number	Type	Direction	Size	During	Description
00	Control	IN / OUT	16	-	Control end point (Default End Point).
81	Interrupt	IN	8	-	Real time reply from Printer to Host.
03	Bulk	OUT	64	-	For transmission of all printable data and commands from host to printer.
82	Bulk	IN	64	-	For return of all synchronous data, status or other types of information except unsolicited status mode messages, from printer to host. (*)

(\*) See also configuration command "Driver Easy Mode" to connect Real time reply from Printer to Host to Bulk In.

#### 4.3. Other information

**Vendor Id** AXIOHM USB Vendor Id = 0x05D9

**Product Id** Asteron USB Product Id = 0xA000

**Remark:** The interface USB is automatically detected.

**Support:** CLASS PRINTER = 0x07.  
CLASS VENDOR = 0x40; AXIOHM\_REQUEST\_REAL\_TIME = 0x00

## 5. PRINT SPECIFICATION

### 5.1. Duty cycle restrictions

39% TON / TOFF.

### 5.2. Characters Print Modes

Available print modes:

- ◆ Standard (Elite)
- ◆ Compressed (Pica)
- ◆ Double High
- ◆ Double Wide
- ◆ Upside Down
- ◆ Rotated
- ◆ Underlined
- ◆ Bold
- ◆ Reverse
- ◆ Italic
- ◆ Scaled

Characters sizes for the Standard, Compressed modes:

#### Standard (Elite)

- ◆ Characters per Inch: 12.70
- ◆ Characters per Line : 24 for 58.0 mm Paper
- ◆ Cell Size: 16 x 24 Dots
- ◆

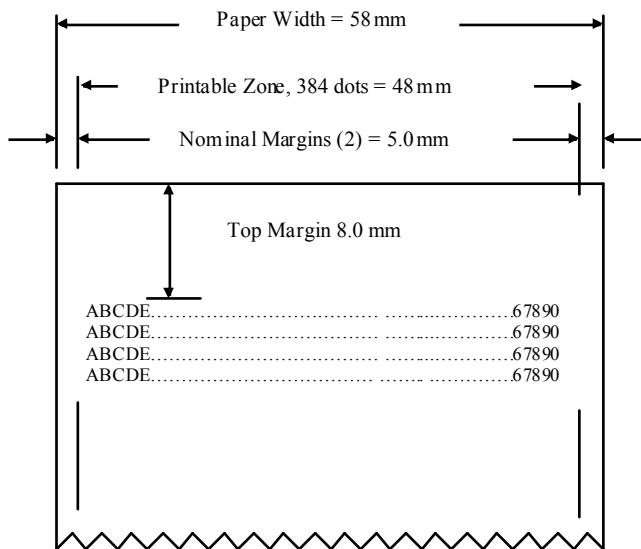
#### Compressed (Pica)

- ◆ Characters per Inch: 16.93
- ◆ Characters per line : 32 for 58.0 mm Paper
- ◆ Cell Size: 12 x 24 Dots

### 5.3. Print zone

Print Zones for 58 mm (2.28 inches) paper:

- ◆ 384 dots (addressable) @ 8 dots/mm, centered on 58 mm
- ◆ Standard mode: 24 columns = 48 mm (1.889 inches)
- ◆ Standard Mode: minimum margins: 5.0 mm (.1968 inches)
- ◆ Top margin to Tear Bar cut: 8.0 mm (0.31 inches)






## 5.4. Character sets

### 5.4.1. Code Page 437 (U.S.A., Standard Europe)

00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0	16	SP	0	@	P	`	p	Ç	É	á	⋮	⌞	⌚	∞	≡
		32	48	64	80	96	112	128	144	160	176	192	208	224	240
01	11	!	1	A	Q	a	q	ü	æ	í	⋮	⌞	⌚	β	±
1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
02	12	"	2	B	R	b	r	é	Æ	ó	⋮	⌞	⌚	Γ	≥
2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
03	13	#	3	C	S	c	s	â	ô	ú	⋮	⌞	⌚	π	≤
3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
04	14	\$	4	D	T	d	t	ä	ö	ñ	⋮	⌞	⌚	Σ	∫
4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
05	15	%	5	E	U	e	u	à	ò	Ñ	⋮	⌞	⌚	σ	J
5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
06	16	&	6	F	V	f	v	å	û	a	⋮	⌞	⌚	μ	÷
6	22	38	54	70	86	103	118	134	150	166	182	198	214	230	246
07	17	'	7	G	W	g	w	ç	ù	o	⋮	⌞	⌚	τ	≈
7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
08	18	(	8	H	X	h	x	ê	ÿ	¿	⋮	⌞	⌚	φ	°
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
09	19	)	9	I	Y	i	y	ë	Ö	⌞	⋮	⌞	⌚	Θ	•
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
0A	1A	*	3A	J	Z	j	z	è	Ü	⌞	⋮	⌞	⌚	Ω	•
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
0B	1B	+	3B	K	[	k	{	ï	¢	½	⋮	⌞	⌚	δ	√
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
0C	1C	,	3C	L	\	l		î	£	¼	⋮	⌞	⌚	∞	n
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
0D	1D	-	3D	M	]	m	}	ì	¥	ı	⋮	⌞	⌚	∅	2
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
0E	1E	.	3E	N	^	n	~	Ä	Pt	«	⋮	⌞	⌚	ε	■
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
0F	1F	/	3F	O	_	o	△	Å	f	»	⋮	⌞	⌚	∩	BLANK
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

5.4.2. Code Page 737 (Greek)<sup>(1)</sup>

	—0	—1	—2	—3	—4	—5	—6	—7	—8	—9	—A	—B	—C	—D	—E	—F
0-	NUL 0000	SOH 0001	STX 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
1-	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
2-	SP 0020	! 0021	« 0022	# 0023	\$ 0024	% 0025	& 0026	' 0027	( 0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
3-	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
4-	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
5-	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[ 005B	\ 005C	] 005D	^ 005E	_ 005F
6-	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
7-	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	 007C	} 007D	~ 007E	␣ 2302
8-	Α 391	Β 392	Γ 393	Δ 394	Ε 395	Ζ 396	Η 397	Θ 398	Ι 399	Κ 39A	Λ 39B	Μ 39C	Ν 39D	Ξ 39E	Ο 39F	Π 3A0
9-	Ρ 3A1	Σ 3A3	Τ 3A4	Υ 3A5	Φ 3A6	Χ 3A7	Ψ 3A8	Ω 3A9	α 3B1	β 3B2	γ 3B3	δ 3B4	ε 3B5	ζ 3B6	η 3B7	θ 3B8
A-	ι 3B9	κ 3BA	λ 3BB	μ 3BC	ν 3BD	ξ 3BE	ο 3BF	π 3C0	ρ 3C1	σ 3C3	ς 3C2	τ 3C4	υ 3C5	φ 3C6	χ 3C7	ψ 3C8
B-	 2591	 2592	 2593	 2502	┌ 2524	≡ 2561	≡ 2562	≡ 2556	≡ 2555	≡ 2563	≡ 2551	≡ 2557	≡ 255D	≡ 255C	≡ 255B	┐ 2510
C-	┌ 2514	└ 2534	┘ 252C	┘ 251C	— 2500	┘ 253C	┘ 255E	┘ 255F	┘ 255A	┘ 2554	┘ 2569	┘ 2566	┘ 2560	≡ 2550	┘ 256C	┘ 2567
D-	┘ 2568	┘ 2564	┘ 2565	┘ 2559	┘ 2558	┘ 2552	┘ 2553	┘ 256B	┘ 256A	┘ 2518	┘ 250C	■ 2588	■ 2584	■ 258C	■ 2590	■ 2580
E-	ω 3C9	ά 3AC	έ 3AD	ή 3AE	ï 3CA	í 3AF	ó 3CC	ú 3CD	ü 3CB	ώ 3CE	Ά 386	Έ 388	Η 389	ΐ 38A	Ό 38C	Υ 38E
F-	Ω 38F	± B1	≥ 2265	≤ 2264	ÿ 3AA	ÿ 3AB	÷ F7	≈ 2248	° B0	· 2219	· B7	√ 221A	n 207F	² B2	■ 25A0	A0

<sup>(1)</sup>IBM PC (OEM) code page.

5.4.3. Code Page 850 (multilingual)

00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0	
			0	@	P	`	p	Ç	É	á	⋮	Ł	ø	Ó	-	
	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
01	11	21	31	41	51	61	71	81	91	A1	B1	C1	D1	E1	F1	
		!	ı	A	Q	a	q	ü	æ	í	⋈	ł	Đ	ß	±	
	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2	
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	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
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	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
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### 5.4.4. Code Page 852 (Latin 2)

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5.4.5. Code Page 858 (MultiLingual + Euro)

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4	20	36	52	\$	D	T	d	t	ä	ö	ñ	⌞	È	õ	¶
05	15	25	35	5	E	U	e	u	à	ò	Ñ	Á	€	Õ	§
5	21	37	53	%	E	U	e	u	à	ò	Ñ	Á	€	Õ	§
06	16	26	36	6	F	V	f	v	â	û	ä	Â	ã	í	μ
6	22	38	54	&	F	V	f	v	â	û	ä	Â	ã	í	μ
07	17	27	37	7	G	W	g	w	ç	ù	ó	À	Ã	î	þ
7	23	39	55	'	G	W	g	w	ç	ù	ó	À	Ã	î	þ
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5.4.6. Code Page 860 (Portuguese)

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02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2
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2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3
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3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
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4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
05	15	25	35	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
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5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
06	16	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
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6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
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9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
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10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
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### 5.4.7. Code Page 862 (Hebrew)

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3	19	35	#	3	C	S	c	s	ד	ף	ú	⌒	⌒	π	≤
04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
4	20	36	\$	4	D	T	d	t	ה	פ	ñ	⌒	⌒	Σ	∫
05	15	25	35	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
5	21	37	%	5	E	U	e	u	ו	ץ	Ñ	⌒	⌒	σ	∫
06	16	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
6	22	38	&	6	F	V	f	v	ז	צ	a	⌒	⌒	μ	÷
07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
7	23	39	'	7	G	W	g	w	ח	ק	o	⌒	⌒	τ	≈
08	18	28	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8
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### 5.4.8. Code Page 863 (Canadian – French)

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1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2
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2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3
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3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
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4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
05	15	25	35	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
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06	16	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
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6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
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7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
08	18	28	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8
(	8	H	X	h	x	ê	α	î	⋮	⌌	⌌	φ	°		
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
09	19	29	39	49	59	69	79	89	99	A9	B9	C9	D9	E9	F9
)	9	I	Y	i	y	ë	ô	⌌	⋮	⌌	⌌	Θ	•		
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
0A	1A	2A	3A	4A	5A	6A	7A	8A	9A	AA	BA	CA	DA	EA	FA
LF	*	:	J	Z	j	z	è	Ü	⌌	⋮	⌌	⌌	Ω	•	
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
0B	1B	2B	3B	4B	5B	6B	7B	8B	9B	AB	BB	CB	DB	EB	FB
ESC	+	;	K	[	k	{	ï	¢	½	⋮	⌌	⌌	■	δ	√
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
0C	1C	2C	3C	4C	5C	6C	7C	8C	9C	AC	BC	CC	DC	EC	FC
,	12	<	L	\			î	£	¼	⋮	⌌	⌌	■	∞	η
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
0D	1D	2D	3D	4D	5D	6D	7D	8D	9D	AD	BD	CD	DD	ED	FD
CR	GS	-	=	M	]	m	}	=	ù	¾	⋮	⌌	⌌	∅	²
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
0E	1E	2E	3E	4E	5E	6E	7E	8E	9E	AE	BE	CE	DE	EE	FE
.	14	>	N	^	n	~	À	Û	«	⋮	⌌	⌌	⌌	ε	■
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	AF	BF	CF	DF	EF	FF
/	15	?	O	-	o	SP	§	f	»	⋮	⌌	⌌	⌌	∩	
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

5.4.9. Code Page 865 (Nordic)

00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0	16	32	0	@	P	`	p	Ç	É	á	⋮	L	ll	∞	≡
01	11	21	31	41	51	61	71	81	91	A1	B1	C1	D1	E1	F1
1	17	33	!	1	A	Q	a	q	ü	æ	í	⌞	⌞	β	±
02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2
2	18	34	"	2	B	R	b	r	é	Æ	ó	⌞	⌞	Γ	≥
03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3
3	19	35	#	3	C	S	c	s	â	ô	ú	⌞	ll	π	≤
04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
4	20	36	\$	4	D	T	d	t	ä	ö	ñ	—	ll	Σ	ƒ
05	15	25	35	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
5	21	37	%	5	E	U	e	u	à	ò	Ñ	⌞	+	F	σ
06	16	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
6	22	38	&	6	F	V	f	v	å	û	a	⌞	⌞	μ	÷
07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
7	23	39	'	7	G	W	g	w	ç	ù	o	⌞	⌞	τ	≈
08	18	28	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8
8	24	40	(	8	H	X	h	x	ê	ÿ	ı	⌞	⌞	φ	°
09	19	29	39	49	59	69	79	89	99	A9	B9	C9	D9	E9	F9
9	25	41	)	9	I	Y	i	y	ë	Ö	—	⌞	⌞	Θ	•
0A	1A	2A	3A	4A	5A	6A	7A	8A	9A	AA	BA	CA	DA	EA	FA
10	26	42	*	:	J	Z	j	z	è	Ü	⌞	⌞	⌞	Ω	•
0B	1B	2B	3B	4B	5B	6B	7B	8B	9B	AB	BB	CB	DB	EB	FB
11	27	43	+	;	K	[	k	{	ï	ø	½	⌞	■	δ	√
0C	1C	2C	3C	4C	5C	6C	7C	8C	9C	AC	BC	CC	DC	EC	FC
12	28	44	,	<	L	\	l		î	£	¼	⌞	■	∞	n
0D	1D	2D	3D	4D	5D	6D	7D	8D	9D	AD	BD	CD	DD	ED	FD
13	29	45	-	=	M	]	m	}	ì	ø	i	⌞	■	∅	²
0E	1E	2E	3E	4E	5E	6E	7E	8E	9E	AE	BE	CE	DE	EE	FE
14	30	46	.	>	N	^	n	~	Ä	Pt	«	⌞	■	ε	■
0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	AF	BF	CF	DF	EF	FF
15	31	47	/	?	O	_	o	△	Å	f	α	⌞	■	∩	

5.4.10. Code Page 866 (Cyrillic)

00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0	16	32	0	@	P	,	p	А	Р	а	⋮	L	ll	р	Ё
01	11	21	31	41	51	61	71	81	91	A1	B1	C1	D1	E1	F1
1	17	33	!	1	А	Q	а	q	Б	С	б	⌊	⌋	с	ё
02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2
2	18	34	"	2	В	Р	в	р	В	Т	в	⌋	⌌	т	€
03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3
3	19	35	#	3	С	Ѕ	с	ѕ	Г	У	г	⌋	⌍	у	€
04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4
4	20	36	\$	4	Д	Т	d	t	Д	Ф	д	⌋	⌎	ф	İ
05	15	25	35	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5
5	21	37	%	5	Е	U	e	u	Е	Х	е	⌋	⌏	х	ï
06	16	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6
6	22	38	&	6	Ф	В	f	v	Ж	Ц	ж	⌋	⌐	ц	ÿ
07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7
7	23	39	'	7	Г	W	g	w	З	Ч	з	⌋	⌑	ч	ÿ
08	18	28	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8
8	24	40	(	8	Н	Х	h	x	И	Ш	и	⌋	⌒	ш	°
09	19	29	39	49	59	69	79	89	99	A9	B9	C9	D9	E9	F9
9	25	41	)	9	І	У	i	y	Й	Щ	й	⌋	⌓	щ	•
0A	1A	2A	3A	4A	5A	6A	7A	8A	9A	AA	BA	CA	DA	EA	FA
10	26	42	*	:	Ј	З	j	z	К	Ъ	к	⌋	⌔	ъ	•
0B	1B	2B	3B	4B	5B	6B	7B	8B	9B	AB	BB	CB	DB	EB	FB
11	27	43	+	;	К	[	k	{	Л	Ы	л	⌋	⌕	ы	√
0C	1C	2C	3C	4C	5C	6C	7C	8C	9C	AC	BC	CC	DC	EC	FC
12	28	44	,	<	Л	\	l		М	Ь	м	⌋	⌖	ь	№
0D	1D	2D	3D	4D	5D	6D	7D	8D	9D	AD	BD	CD	DD	ED	FD
13	29	45	-	=	М	]	m	}	Н	Э	н	⌋	⌗	э	ѡ
0E	1E	2E	3E	4E	5E	6E	7E	8E	9E	AE	BE	CE	DE	EE	FE
14	30	46	.	>	Н	^	n	~	О	Ю	о	⌋	⌘	ю	■
0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	AF	BF	CF	DF	EF	FF
15	31	47	/	?	О	_	o	△	П	Я	п	⌋	⌙	я	

5.4.11. Code Page 1252 (Latin 1)

00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0	
0	16	32	0	@	P	`	p	€	Not Used 144	NBSP	°	À	Đ	à	đ	
01	11	21	31	41	51	61	71	81	91	A1	B1	C1	D1	E1	F1	
1	17	33	!	1	A	Q	a	q	Not Used 129	'	i	±	Á	Ñ	á	ñ
02	12	22	32	42	52	62	72	82	92	A2	B2	C2	D2	E2	F2	
2	18	34	"	2	B	R	b	r	,	¢	²	Â	Ò	â	ò	
03	13	23	33	43	53	63	73	83	93	A3	B3	C3	D3	E3	F3	
3	19	35	#	3	C	S	c	s	f	“	£	³	Ã	Ó	ã	ó
04	14	24	34	44	54	64	74	84	94	A4	B4	C4	D4	E4	F4	
4	20	36	\$	4	D	T	d	t	”	α	'	Ä	Ô	ä	ô	
05	15	25	35	45	55	65	75	85	95	A5	B5	C5	D5	E5	F5	
5	21	37	%	5	E	U	e	u	...	·	¥	μ	Å	Ö	å	ö
06	16	26	36	46	56	66	76	86	96	A6	B6	C6	D6	E6	F6	
6	22	38	&	6	F	V	f	v	†	-	¡	¶	Æ	Ö	æ	ö
07	17	27	37	47	57	67	77	87	97	A7	B7	C7	D7	E7	F7	
7	23	39	'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
08	18	28	38	48	58	68	78	88	98	A8	B8	C8	D8	E8	F8	
8	24	40	(	8	H	X	h	x	^	~	..	¸	È	Ø	è	ø
09	19	29	39	49	59	69	79	89	99	A9	B9	C9	D9	E9	F9	
9	25	41	)	9	I	Y	i	y	‰	™	©	´	É	Ù	é	ù
0A	1A	2A	3A	4A	5A	6A	7A	8A	9A	AA	BA	CA	DA	EA	FA	
10	26	42	*	:	J	Z	j	z	Š	š			Ê	Ú	ê	ú
0B	1B	2B	3B	4B	5B	6B	7B	8B	9B	AB	BB	CB	DB	EB	FB	
11	27	43	+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	û
0C	1C	2C	3C	4C	5C	6C	7C	8C	9C	AC	BC	CC	DC	EC	FC	
12	28	44	,	<	L	\	l		Œ	œ	¬	¼	Ì	Ü	ì	ü
0D	1D	2D	3D	4D	5D	6D	7D	8D	9D	AD	BD	DD	ED	FD		
13	29	45	-	=	M	]	m	}	Not Used 141	Not Used 157	ŠHY	½	Í	Ý	í	ý
0E	1E	2E	3E	4E	5E	6E	7E	8E	9E	AE	BE	DE	EE	FE		
14	30	46	.	>	N	^	n	~	Ž	ž	®	¾	Î	Þ	î	þ
0F	1F	2F	3F	4F	5F	6F	7F	8F	9F	AF	BF	DF	EF	FF		
15	31	47	/	?	O	_	o	△	Not Used 143	ÿ	—	ı	İ	ß	ï	ÿ

5.4.12. Code Page 1253 (Greek) <sup>(1)33</sup>

	—0	—1	—2	—3	—4	—5	—6	—7	—8	—9	—A	—B	—C	—D	—E	—F
0-	NUL 0000	SOH 0001	STX 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
1-	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
2-	SP 0020	! 0021	« 0022	# 0023	\$ 0024	% 0025	& 0026	' 0027	( 0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
3-	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
4-	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
5-	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[ 005B	\ 005C	] 005D	^ 005E	_ 005F
6-	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
7-	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	 007C	} 007D	~ 007E	␣ 2302
8-	€ 20AC		' 201A	f 192	” 201E	... 2026	† 2020	‡ 2021		‰ 2030		< 2039				
9-		' 2018	' 2019	“ 201C	” 201D	• 2022	— 2013	— 2014		™ 2122		> 203A				
A-		“ 385	À 386	£ A3	¤ A4	¥ A5	¦ A6	§ A7	¨ A8	© A9		« AB	¬ AC	AD	® AE	— 2015
B-	° B0	± B1	² B2	³ B3	´ 384	µ B5	¶ B6	· B7	Έ 388	Η 389	Ί 38A	» BB	Ό 38C	½ BD	Υ 38E	Ω 38F
C-	ϊ 390	Α 391	Β 392	Γ 393	Δ 394	Ε 395	Ζ 396	Η 397	Θ 398	Ι 399	Κ 39A	Λ 39B	Μ 39C	Ν 39D	Ξ 39E	Ο 39F
D-	Π 3A0	Ρ 3A1		Σ 3A3	Τ 3A4	Υ 3A5	Φ 3A6	Χ 3A7	Ψ 3A8	Ω 3A9	Ϊ 3AA	Ϋ 3AB	ά 3AC	έ 3AD	ή 3AE	ί 3AF
E-	Û 3B0	α 3B1	β 3B2	γ 3B3	δ 3B4	ε 3B5	ζ 3B6	η 3B7	θ 3B8	ι 3B9	κ 3BA	λ 3BB	μ 3BC	ν 3BD	ξ 3BE	ο 3BF
F-	π 3C0	ρ 3C1	ς 3C2	σ 3C3	τ 3C4	υ 3C5	φ 3C6	χ 3C7	ψ 3C8	ω 3C9	ϊ 3CA	ϋ 3CB	ό 3CC	ύ 3CD	ώ 3CE	

<sup>1)</sup>Windows (ANSI) code pages

5.4.13. Code Page KATAKANA

	—0	—1	—2	—3	—4	—5	—6	—7	—8	—9	—A	—B	—C	—D	—E	—F
8-	0080 —	0081 —	0082 —	0083 ■	0084 ■	0085 ■	0086 ■	0087 ■	0088 	0089 	008A 	008B 	008C 	008D 	008E 	008F +
9-	0090 ⊥	0091 ⊥	0092 ⊥	0093 ⊥	0094 —	0095 —	0096 	0097 	0098 ┌	0099 └	009A └	009B └	009C └	009D └	009E └	009F └
A-	00A0 	00A1 ○	00A2 「	00A3 」	00A4 、	00A5 ・	00A6 ヲ	00A7 ヲ	00A8 イ	00A9 ウ	00AA エ	00AB オ	00AC ヤ	00AD ユ	00AE ヨ	00AF ツ
B-	00B0 —	00B1 ア	00B2 イ	00B3 ウ	00B4 エ	00B5 オ	00B6 カ	00B7 キ	00B8 ク	00B9 ケ	00BA コ	00BB サ	00BC シ	00BD ス	00BE セ	00BF ソ
C-	00C0 タ	00C1 チ	00C2 ツ	00C3 テ	00C4 ト	00C5 ナ	00C6 ニ	00C7 ヌ	00C8 ネ	00C9 ノ	00CA ハ	00CB ヒ	00CC フ	00CD ヘ	00CE ホ	00CF マ
D-	00D0 ミ	00D1 ム	00D2 メ	00D3 モ	00D4 ヤ	00D5 ユ	00D6 ヨ	00D7 ラ	00D8 リ	00D9 ル	00DA レ	00DB ロ	00DC ワ	00DD ン	00DE “	00DF ・
E-	00E0 ニ	00E1 ト	00E2 ナ	00E3 ノ	00E4 ▲	00E5 ▲	00E6 ▲	00E7 ▲	00E8 ♠	00E9 ♥	00EA ♦	00EB ♣	00EC ●	00ED ○	00EE /	00EF \
F-	00F0 ×	00F1 円	00F2 年	00F3 月	00F4 日	00F5 時	00F6 分	00F7 秒	00F8 〒	00F9 市	00FA 区	00FB 町	00FC 村	00FD 人	00FE ■	00FF 

## 6. SELF TEST TICKET DESCRIPTION

### 6.1. Self Test

The self test ticket can be printed by pressing both Reset and Paper feed button and realising the Reset button. Here is the description of all the lines that you can read when you print a self test. During the self test, the printer is offline.

*** SELF TEST ***		
Model number	: ASTERON	- This is a 15 digit number fixed by AXIOHM.
Serial number	: 000000000	- This is a 10 digits number fixed by AXIOHM. (see definition below)
Revision nbr	: 000000000	- This is a 10 digits number. Settable by user.
Version (Rev_Crc	: 00.44_1EE7	- Identify main program layer fixed by AXIOHM (revision_CRC).
COMM. USB	: 4 EndPoints	- This is a USB setting parameters
Rx Buffer Size	: 2048 Bytes	- This indicates the size of the data Input buffer (in bytes).
Paper Type	: AF50KSE3	- Indicates the reference of the paper used.
Density	: 100 %	- Percentage of the nominal heating time value.
Multi-heat Mode	: Off	- Indicates the status of multi-heat mode
Max. Speed	: 60 mm/sec	- Printer top speed limit
Default Font	: 16x24	- Indicates default font selected upon reset
Code Page	: 437	- Indicates default code page selected upon reset.
Press and hold Paper Feed Button One second after printing Self-Test to Enter Sub-menus		- How enter to Sub Menu.
Ready.		

### 6.2. Sub-Menus

During the Sub-Menus execution, the printer is offline (Busy Mode).

Select Code Number :	
- EXIT	→ 1 click
- SelfTest	→ 2 clicks
- Print Diagnostic	→ 3 clicks
- Short click : Feed Button is quickly pressed then released.	
- Long click : Feed Button is held down more than 1 second then released.	
Enter Code Number [Sort click], and validate [Long click].	

### 6.3. Diagnostic Form

#### \*\* Diagnostics Form \*\*

Model number : ASTERON USB  
Serial number : 000000000

Revision number : 000000000

#### - Firmware (Id\_Rev\_Crc) -

Boot Strap 7300469\_00.05\_63E3  
Boot Loader 7300456\_00.25\_A1E3  
Client 7300457\_00.46\_2F5A

#### - Hardware -

Board Id. : 3110439  
CPU Clock Freq. : 72 MHz  
Flash Size (Kbytes) : 512  
RAM size (Kbytes) : 64  
Max. Power : 18 W  
System Watchdog : On  
Low Voltage Reset : On  
Eeprom Rev. : 0.004  
.Cluster Erasing : 00001

#### - Mechanism parameters -

Type : Asteron  
Paper Type : AF50KSE3  
Print Density : 100 %  
Low Voltage Detec. : On  
Power Supply : 5.00V  
- Multi-Heat Mode : Off  
Number dots max. : 256  
Number heats max. : 02  
Min. Speed (mm/s) : 07.00  
Max. Speed (mm/s) : 40.00  
- Motor Current :  
Paper advance : 350.00 mA  
Pwm (Cyc./Period) : 84/120  
- Detection Sensor :  
Cover Open : On  
Threshold :  
Paper Out : 128

#### - Communication Interface -

Fault Recovery : Automatic  
USM Count Mode : Disabled  
- USB  
Rx Buffer Size : 2048  
Number of Endpoint : 4  
USM Mode : Disabled  
Driver Easy Mode : Disabled

#### - User Flash Storage (Kbytes) -

Max. Sector Size : 128  
Logos/Fonts Sector : 64  
User Sector / byte : 64/2  
Easy Font Sector : 0

- This is a 15 digit number fixed by AXIOHM.  
- 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.  
- This is a 10 digits number. Settable by user.

- Printer firmware Identification\_Revision\_CRC  
- Identify boot Strap layer fixed by AXIOHM.  
- Identify boot Loader layer fixed by AXIOHM.  
- Identify main program layer fixed by AXIOHM.

- Electronic board identification number fixed by AXIOHM.  
- Microprocessor Clock frequency.  
- Size of flash Total  
- Size of RAM Total  
- Maximum average power drawn from power supply.  
- Status system watchdog.  
- Status reset low voltage.  
- Non Volatile memory firmware revision.  
- Indicates the number of cluster initialization

- Indicates the mechanism series  
- Indicates the reference of the paper used matching with the mechanism.  
- Percentage of the nominal heating time value for specified paper. See code (1F0B 4E 52 4An) or (1D 4E n).  
- Low voltage detection (stop printing if voltage under 4,20V). See Code (1F03 91 m).  
- Result of voltage measurement  
- Status of multi-heat mode. See code (1D25 s n0n1) or  
- Printed only if multi-heat mode selected (On). [32≤Number dots≤383].  
- Printed only if multi-heat mode selected (On). [02≤Number Heats≤12].  
- Printed only if multi-heat mode selected (On). Printing top low speed  
- Printer top speed limit. See code (1F 0C 53 50 46 nL nH).

- Motor output current  
- Select current reference.  
- Status cover sensor option (selected or no). See code (1F 03 89 m)  
- Indicates the paper out detection threshold. See code (1D 73 01 n).

- Indicated whether printer restarts automatically when a fault condition disappears or if an action from the host is required. See code (1F 03 90 m)  
- Indicates operating mode: Normal or extended. In extended mode, Position count modification triggers USM transmission. See code (1F 03 9D m).

- This indicates the size of the data Input buffer (Bytes) See Code (1F 0A 52 3D n)  
- Printer USB Interface, number of endpoints See code (1F 02 03 p1...p6)  
- USM USB transmission On/Off status. See code (1D 61 n)  
- Driver Easy Mode On/Off Status. See code (1F 03 D3 n)

- Total size of the flash memory for user storage. See code sector allocation (1D 22 55 n1 n2)  
- Flash memory allocated for logos or user defined fonts.  
- Flash memory allocated for user data storage (ex: electronic journal)  
- Flash memory allocated for Easy font storage (ex: Asian font).

- Printer Options -	
Diagnostics	: Off
Default LPI	: 8.13
Carriage Return	: Ignored
Logo(s) defined	: No
User Char(s) def.	: No
- Fonts -	
Default	: 12*24
Resident	: 12*24, 16*24
- Code Page -	
Default	: 437
Resident	: 437, 737, 850, 852, 858, 860, 862, 863, 865, 866, 1252, 1253, Katakana
Easy Font Defined	: No
- User Tallies - <sup>(1)</sup>	
Max Temp	: 38.02
Cover Openings	: 21
Lines written	: 2468
Flash cycles	: 5
Hours ON	: 13
Meter Print	: 3
Reboot Device	: 30

- See code (1F 03 00 n). This line indicates in which mode the board is :
  - Off corresponds to a standard mode
  - Data Scope is used to print data in ASCII and HEX format received from the host
  - Demo mode.
- Default inter-lines spacing. See code (1F 03 94 m)
- Select how to process a 0DH character received from the host. See code (1F 03 94 m).
- Current status= YES if at least one logo is defined
- Current status= YES if at least one character is defined
- Indicates default font (Resident/User/EasyFont) selected upon reset. See Code (1F 03 0F m)
- List of internal fonts.
- Indicates default code page (resident/ EasyFont) selected upon reset. See Code (1F 03 80 n)
- List of internal codes pages.
- Current status= YES if at least one character font is defined.
- Tallies printed= Current counter value / Not the NVM value <sup>(1)</sup>.
- Indicates the maximum temperature (in C degrees) reached by the print-head.
- Indicates the number of cover opening/close cycles.
- Indicates the number of lines printed
- Indicates the number of flash memory download program.
- Indicates the number of hours the board has been turned ON.
- Indicates the number of meters printed.
- Number of time that the printer controller board had been reset.

<sup>(1)</sup> Tallies are updated every 1/2 hour in No Volatile Memory.

(For further information, please contact your distributor or Axiohm Technical Support Team at [www.axiohm.com](http://www.axiohm.com))

### 6.3.1. List of parameters that can be changed

Set Hardware Options	Set Communication Options	Set Print Options
Maximum Power <i>18 W</i>	Fault Recovery <i>Automatic</i> FromHost	Diagnostics Mode <i>Off</i> Data-scope Receipt Test Demo Com-scope
System Watchdog <i>On</i> <i>Off</i>	USM Count Mode <i>Disabled</i> Enabled	Default LPI 6.00 7.52 8.13
<b>Set Mechanism Options</b>	RX Buffer Size 1024 2048 3072 4096	CR Usage <i>Ignored</i> Print CMD
Type <i>Asteron</i>	Number of End Point 3 4	Default Font 12*24 16*24 User Defined Easy[0] Easy[1] Easy[2] Easy[3]
Paper Type <i>AF50KSE3</i>	USB USM Mode <i>Disabled</i> EP Bulk EP Interrupt	Default Code Page <i>CP 437</i> CP 737 CP 850 CP 852 CP 858 CP 860 CP 862 CP 863 CP 865 CP 866 CP 1252 CP 1253 Katakana
Print density 80% <i>100%</i> 120%	Driver Easy Mode <i>Disabled</i> Enabled	
Low Voltage Dect. <i>Enabled</i> Disabled	<b>User Flash Storage (Kbytes)</b>	
Power Supply <i>5.00V</i> <sup>(1)</sup> 6.00V 9.00V	Logos/Fonts sector 0 <i>64</i> 128 256 <sup>(2)</sup>	
Multi-heat mode Enabled <i>Disabled</i>	User sector 1 byte 2 bytes 0 <i>64</i> 128 256 <sup>(2)</sup>	
Print Speed 40 mm/sec <i>70 mm/sec</i> 100 mm/sec	Easy Font sector 0 64 128 256 <sup>(2)</sup>	
Paper advance current 0 mA <i>350 mA</i> 500 mA		
Cover Open sensor Enabled <i>Disabled</i>		
Paper Out Threshold 0 <i>128</i> 255		

(1) 4.50V if Low Voltage Detector disabled  
(2) Option [256kb; 768kb]. Contact your vendor.

## 7. COMMANDS ARRANGED BY FUNCTION

### 7.1. Reset Commands

Code ASCII	Code Hexadecimal	Description	Page
<i>DLE</i>	<b>10</b>	Initialize Printer.	<b>60</b>
<i>ESC @</i>	<b>1B 40</b>	Initialize Printer.	<b>81</b>
<i>GS (SPACE)</i>	<b>1D FF</b>	Reboot Printer.	<b>135</b>

### 7.2. Vertical Positioning and Print Commands

The vertical positioning and print commands control the vertical print positions of characters on the receipt.

Code ASCII	Code Hexadecimal	Description	Page
<i>LF</i>	<b>0A</b>	Print and Feed One Line.	<b>59</b>
<i>CR</i>	<b>0D</b>	Activate Carriage Return.	<b>60</b>
<i>DC4 n</i>	<b>14 n</b>	Feed <i>n</i> Print Lines.	<b>68</b>
<i>NAK n</i>	<b>15 n</b>	Feed <i>n</i> Dot Rows.	<b>68</b>
<i>SYN n</i>	<b>16 n</b>	Add <i>n</i> Extra dot Rows.	<b>69</b>
<i>ETB</i>	<b>17</b>	Print One Line.	<b>69</b>
<i>ESC SP n</i>	<b>1B 20 n</b>	Set Right-Side Character Spacing.	<b>72</b>
<i>ESC 2</i>	<b>1B 32</b>	Set Line Spacing to 1/6 inch.	<b>79</b>
<i>ESC 3 n</i>	<b>1B 33 n</b>	Set Line Spacing.	<b>79</b>
<i>ESC J n</i>	<b>1B 4A n</b>	Print and Feed Paper.	<b>84</b>
<i>ESC d n</i>	<b>1B 64 n</b>	Print and Feed <i>n</i> Lines.	<b>93</b>

### 7.3. Horizontal positioning Commands

The horizontal positioning commands control the horizontal print positions of characters on the receipt.

Code ASCII	Code Hexadecimal	Description	Page
<i>HT</i>	<b>09</b>	Horizontal Tab.	<b>59</b>
<i>ESC DC4 n</i>	<b>1B 14 n</b>	Set Column.	<b>71</b>
<i>ESC \$ n1 n2</i>	<b>1B 24 n1 n2</b>	Set Absolute Starting Position.	<b>74</b>
<i>ESC D [n]...kNUL</i>	<b>1B 44 [n]...kNUL</b>	Set Horizontal Tab Positions.	<b>82</b>
<i>ESC \ nL nH</i>	<b>1B 5C nL nH</b>	Set relative Print Position.	<b>91</b>
<i>ESC a n</i>	<b>1B 61 n</b>	Select Justification.	<b>92</b>
<i>GS L nL nH</i>	<b>1D 4C nL nH</b>	Set Left Margin.	<b>120</b>
<i>GS P x y</i>	<b>1D 50 x y</b>	Set Horizontal and Vertical Minimum Motion Units.	<b>121</b>
<i>GS W nL nH</i>	<b>1D 57 nL nH</b>	Set Printing Area Width.	<b>122</b>

## 7.4. Print Characteristic Commands

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

Code ASCII	Code Hexadecimal	Description	Page
<i>DC2</i>	<b>12</b>	Select Double –Wide Characters.	<b>67</b>
<i>DC3</i>	<b>13</b>	Select Single-Wide Characters.	<b>68</b>
<i>ESC DC2</i>	<b>1B 12</b>	Select 90 Degree Counter-Clockwise Rotated Print.	<b>70</b>
<i>ESC ! n</i>	<b>1B 21 n</b>	Select Print Mode.	<b>73</b>
<i>ESC – n</i>	<b>1B 2D n</b>	Select or Cancel Underline Mode.	<b>78</b>
<i>ESC E n</i>	<b>1B 45 n</b>	Select or cancel Emphasized Mode.	<b>82</b>
<i>ESC G n</i>	<b>1B 47 n</b>	Select or cancel Double Strike.	<b>83</b>
<i>ESC I n</i>	<b>1B 49 n</b>	Select or cancel Italic Print.	<b>83</b>
<i>ESC V n</i>	<b>1B 56 n</b>	Select or Cancel 90 Degree Clockwise Rotated print.	<b>88</b>
<i>ESC { n</i>	<b>1B 7B n</b>	Select or cancel Upside –Down Print Mode.	<b>96</b>
<i>GS! n</i>	<b>1D 21 n</b>	Select Character Size.	<b>106</b>
<i>GS B n</i>	<b>1D 42 n</b>	Select Or Cancel White/Black Reverse Print Mode.	<b>115</b>
<i>US ENQ n</i>	<b>1F 05 n</b>	Select Superscript or Subscript Modes.	<b>145</b>

### 7.4.1 Summary of Rotated Printing

The table shows the combinations of upside-down print, 90 degree clockwise rotated print, and 90 degree counterclockwise rotated print.

90 degree clock wise rotated and 90 degree counterclockwise rotated print commands are mutually exclusive: The setting of the last received command is effective.

The samples of the print show only the normal size characters. Double-wide and double-high characters are printed in the same orientation. They may also be mixed on the same line.

Upside Down <b>1B 7B n</b>	Rotated CW <b>1B 56 n</b>	Rotated CCW <b>1B 12</b>	Resulting Output
Canceled	Canceled	Canceled	1 (See Below)
Canceled	Set	Canceled	2 (See Below)
Set	Canceled	Canceled	3 (See Below)
Set	Set	Canceled	4 (See Below)
Canceled	Canceled	Set	5 (See Below)
Set	Canceled	Set	6 (See Below)

1.  2.  3.  4.  5.  6. 

**Note:** Right-side up and upside down print modes cannot be mixed on the same line.

## 7.5. Font Commands

Code ASCII	Code Hexadecimal	Description	Page
<i>ESC SYN n</i>	<b>1B 16 n</b>	Select pitch (Column Width).	<b>71</b>
<i>ESC % n</i>	<b>1B 25 n</b>	Select Character Set.	<b>74</b>
<i>ESC &amp; s cl c2 n1 dl ... dn</i>	<b>1B 26 s cl c2 n1 ...</b>	Define User-Defined Character Set.	<b>75</b>
<i>ESC : 0 0 0</i>	<b>1B 3A 30 30 30</b>	Copy Character Set from Rom to Ram.	<b>80</b>
<i>ESC R n</i>	<b>1B 52 n</b>	Select International Character Set.	<b>86</b>
<i>ESC t n</i>	<b>1B 74 n</b>	Select Page Code or Active User-defined Font Select.	<b>94</b>
<i>GS H n</i>	<b>1D 42 n</b>	Select or Cancel White /Black Reverse Print Mode.	<b>115</b>
<i>US &amp; H cn cm ln [dnk] ...lm [dmk]</i>	<b>1F 26 48 cn cm ln ...</b>	Define User-Defined Character Set with variable Height.	<b>157</b>
<i>US F n</i>	<b>1F 46 n</b>	Select Font User.	<b>159</b>
<i>US i n</i>	<b>1F 69 n</b>	Select Active User-Defined Character.	<b>161</b>
<i>US k</i>	<b>1F 6B</b>	Upload Font.	<b>162</b>
<i>US z n</i>	<b>1F 7A n</b>	Return User Font Status.	<b>165</b>

## 7.6. Easy Font Commands

The downloadable fonts are stored in Flash memory in a dedicated area, separate from the code and usual logos and user font's storage areas.

Code ASCII	Code Hexadecimal	Description	Page
<i>FS F t</i>	<b>1C 46 t</b>	<b>Read Font information.</b>	<b>96</b>
<i>FS H</i>	<b>1C 48</b>	<b>Check Easy Font Compatibility.</b>	<b>97</b>
<i>FS L f8 t w n {d}</i>	<b>1C 4C f8 t w n {d}</b>	<b>Download Single Byte Font.</b>	<b>98</b>

## 7.7. Graphics Commands

These commands are used to enter and print graphics data and are described in order of their hexadecimal codes.

Code ASCII	Code Hexadecimal	Description	Page
<i>DC1 n1 ...n1</i>	<b>11 n1 ...n1</b>	Print Raster Graphics (GFX).	<b>67</b>
<i>ESC * m n1 n2 dl ... dn</i>	<b>1B 2A m n1 n2 dl ...</b>	Select Bit Image Mode.	<b>76</b>
<i>ESC . m nR rH dl ... dn</i>	<b>1B 2E m n rL rH ...</b>	Advanced Raster graphics.	<b>78</b>
<i>ESC K n1 n2 dl ... dn</i>	<b>1B 4B n1 n2 dl ...</b>	Select Single Density Graphics.	<b>84</b>
<i>ESC Y n1 n2 dl ... dn</i>	<b>1B 59 n1 n2 dl ...dn</b>	Select Double-Density Graphics.	<b>90</b>
<i>GS v 0 m xl xh yl yh dl ... dk</i>	<b>1D 76 30 m xl xh ...</b>	Print Raster Bit Image.	<b>133</b>
<i>US LF i n</i>	<b>1F 0A 8B n</b>	Set GFX Print Area Width.	<b>153</b>
<i>US B M P [file]</i>	<b>1F 42 4D 50 [file]</b>	Print a BMP File.	<b>158</b>

<i>US y n</i>	<b>1F 79 n</b>	Set Low Resolution Raster Graphics.	<b>165</b>
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## 7.8. Logo Commands

Code ASCII	Code Hexadecimal	Description	Page
<i>ESC BMP [File]</i>	<b>1B 42 4D 50 [File]</b>	Download BMP Logo.	<b>81</b>
<i>GS # n</i>	<b>1D 23 n</b>	Select the Current Logo.	<b>109</b>
<i>GS * n1 n2 d1 ... dn</i>	<b>1D 2A n1 n2 d1 ... dn</b>	Define Download Bit Image.	<b>112</b>
<i>GS / m</i>	<b>1D 2F m</b>	Print Download Bit Image.	<b>113</b>
<i>US e n</i>	<b>1F 65 n</b>	Return Logo Checksum.	<b>161</b>
<i>US j</i>	<b>1F 6A</b>	Upload Logo.	<b>162</b>

## 7.9. 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 printhead cool down, the printer will resume processing the data in its receive buffer.

Real Time commands allow the printer to function when it is busy at the communication interface. See the following section, Real Time Commands, for details about these commands.

Code ASCII	Code Hexadecimal	Description	Page
<i>ESC v</i>	<b>1B 76</b>	Transmit Paper Sensor status	<b>95</b>
<i>GS LF</i>	<b>1D 0A</b>	Return Hardware Information.	<b>103</b>
<i>GS I n</i>	<b>1D 49 01 or 31</b>	Transmit <i>Printer Model ID</i> .	<b>116</b>
<i>GS I n</i>	<b>1D 49 02 or 32</b>	Transmit <i>Type ID</i> .	
<i>GS I @ +</i>	<b>1D 49 40 2B</b>	Return <i>Boot firmware part number</i> .	<b>117</b>
<i>GS I @ 3</i>	<b>1D 49 40 33</b>	Return <i>Client firmware part number</i> .	
<i>GS I B</i>	<b>1D 49 42</b>	Transmit <i>Printer Manufacturer</i> .	<b>116</b>
<i>GS I C</i>	<b>1D 49 43</b>	Transmit <i>Printer Name</i> .	
<i>GS I D</i>	<b>1D 49 44</b>	Transmit <i>Serial Number</i> .	
<i>GS a n</i>	<b>1D 61 n</b>	Select or Cancel unsolicited status Mode (USM)	<b>125</b>
<i>GS l m</i>	<b>1D 6C m</b>	Transmit Selected Sensor A/D Value.	<b>130</b>
<i>GS s n</i>	<b>1D 72 n</b>	Transmit status (Paper Sensor, Flash Memory User Sector Status).	<b>131</b>
<i>US LF ä</i>	<b>1F 0A 84</b>	Read <i>Voltage Monitoring</i> .	<b>152</b>
<i>US LF à</i>	<b>1F 0A 85</b>	Read <i>Temperature Monitoring</i> .	
<i>US V</i>	<b>1F 56</b>	Send Printer Software Version	<b>159</b>
<i>US v n</i>	<b>1F 76 n</b>	Buffered status transmission	<b>163</b>

## 7.10. 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: GS (Hex 1D) Sequence and DLE (Hex 10) Sequence.
- ◆ Real Time Request to Printer: GS (Hex 1D) Sequence and 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 printhead overheat, 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.

### Rules for Using Real Time Commands

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 0x03 (BULK OUT).

Responses to real times commands are transmitted back to the host on endpoint 0x82 (BULK IN) or 0x81 (INTERRUPT IN). See command US STX *n1* ... *n6* (Hex 1F 02...) set tree of four end points.

### Summary of USB End Point for Real Time Commands

Command <sup>(2)</sup> (1F 02 <i>n1</i> .. <i>n6</i> ) Number of End Points	Command <sup>(2)</sup> (1F 03 D3 <i>n</i> ) Easy Driver	End Point for Real Time Command Received	Real Time Command Reply
4	Canceled	Interrupt Out	➔ Interrupt In
4	Set	Interrupt Out Bulk Out	➔ Interrupt In ➔ Bulk In
3 <sup>(1)</sup>	Canceled <sup>(1)</sup>	BulkOut	➔ Interrupt In
3	Set	Bulk Out	➔ Bulk In

<sup>(1)</sup>Default Value.

<sup>(2)</sup> Configuration command.

### Busy Line and Fault Conditions

If the printer is in error condition (cover is open, paper is exhausted...), the printer will still accept data, respond to the batch mode status commands (ESC v and ESC u) and not go busy until it actually tries to execute a print command. 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.

Table of Real Time Commands

Code ASCII	Code Hexadecimal	Description	Page	
<i>DLE EOT SOH</i>	<b>10 04 01</b>	Real Time Status Transmit <i>Printer status.</i>	<b>61</b>	
<i>DLE EOT STX</i>	<b>10 04 02</b>	Real Time Status Transmit <i>Offline status.</i>		
<i>DLE EOT ETX</i>	<b>10 04 03</b>	Real Time Status Transmit <i>Error status.</i>		
<i>DLE EOT EOT</i>	<b>10 04 04</b>	Real Time Status Transmit <i>receipt paper status.</i>		
<i>DLE EOT v</i>	<b>10 04 76</b>	Real Time Status Transmit <i>Paper Status.</i>		
<i>DLE ENQ STX</i>	<b>10 05 02</b>	Real Time Recovery from fault.	<b>63</b>	
<i>DLE ACK</i>	<b>10 06</b>	Real time <i>Current position count transmission (USM).</i>	<b>64</b>	
<i>DLE EM NULL</i>	<b>10 19 00</b>	Extended real time <i>Memory Allocation.</i>	<b>65</b>	
<i>DLE EM SOH</i>	<b>10 19 01</b>	Extended real time <i>Printer Status.</i>		
<i>DLE EM STX</i>	<b>10 19 02</b>	Extended real time <i>Error Status.</i>		
<i>DLE EM ETX</i>	<b>10 19 03</b>	Extended real time <i>No defined reply one byte = 80h.</i>		
<i>DLE EM EOT</i>	<b>10 19 04</b>	Extended real time <i>Environmental status.</i>		
<i>DLE EM ENQ</i>	<b>10 19 05</b>	Extended real time <i>Print Buffer Status.</i>		
<i>DLE EM ACK</i>	<b>10 19 06</b>	Ext. real time <i>COM port Receive Buffer Status.</i>		
<i>DLE EM BEL</i>	<b>10 19 07</b>	Ext. real time <i>Print Commands Processings.</i>		
<i>DLE EM BS</i>	<b>10 19 08</b>	Ext. real time <i>Clear Counter Of Print Command.</i>		
<i>DLE EM HT</i>	<b>10 19 09</b>	Ext. <i>Clear SRAM &amp; FLASH Memory Allocation Error.</i>		
<i>DLE EM LF</i>	<b>10 19 0A</b>	Extended real time <i>Printer Serial Number.</i>		
<i>DLE EM VT</i>	<b>10 19 0B</b>	Extended real time <i>Printer Software Revision.</i>		
<i>DLE EM NP</i>	<b>10 19 0C</b>	Extended real time <i>Model Number.</i>		
<i>GS ETX n</i>	<b>1D 03 n</b>	Real time recovery from Fault ( <b>same 10 05 n</b> ).		<b>100</b>
<i>GS EOT SOH</i>	<b>1D 04 01</b>	Real Time Status Transmit <i>Printer Status (Same 10 04 01).</i>		<b>100</b>
<i>GS EOT STX</i>	<b>1D 04 02</b>	Real Time Status Transmit <i>Offline Status (Same 10 04 02).</i>		
<i>GS EOT ETX</i>	<b>1D 04 03</b>	Real Time Status Transmit <i>Error status (Same 10 04 02).</i>		
<i>GS EOT EOT</i>	<b>1D 04 04</b>	Real Time Transmit <i>Receipt Paper Status (Same 10 04 04).</i>		
<i>GS EOT v</i>	<b>1D 04 76</b>	Real Time Status Transmit <i>Paper Status (Same 10 04 76).</i>		
<i>GS ENQ</i>	<b>1D 05</b>	Real time printer status transmission.	<b>101</b>	

### 7.11. Bar Code Commands

These commands format and print bar codes and are described in order of their hexadecimal codes.

Code ASCII	Code Hexadecimal	Description	Page
<i>GS H n</i>	<b>1D 48 n</b>	Select printing Position of HRI Characters.	<b>115</b>
<i>GS f n</i>	<b>1D 66 n</b>	Select Pitch of HRI Characters.	<b>127</b>
<i>GS h n</i>	<b>1D 68 n</b>	Select Bar Code Height.	<b>127</b>
<i>GS k m dl ... dk NUL</i>	<b>1D 6B m dl...</b>	Print Bar Code first variation.	<b>128</b>
<i>GS k m n dl ... dk</i>	<b>1D 6B m n dl ... dk</b>	Print Bar Code second variation.	<b>128</b>
<i>GS m nthick nthin</i>	<b>1D 6D m nthick ...</b>	Set bar Code Aspect Ratio (IF and Code 39 only).	<b>130</b>
<i>GS w n</i>	<b>1D 77 n</b>	Select Bar Code Width	<b>134</b>

## 7.12. Page Mode Commands

Page mode is one of two modes that the printer controller uses to operate. Standard mode is typical of how most printers operate by printing data as it is received and feeding paper as the various paper feed commands are received. Page mode is different in that it processes or prepares the data as a “page” in memory before it prints it. Think of this as a virtual page. The page can be any area within certain parameters that you define. The page printed using either the FF (0C) or the ESC FF (1B 0C) command.

The select page mode command (1B 4C) puts the printer into page mode. Any commands that are received are interpreted as page mode commands. Several commands react differently when in standard and page mode. The description of these individual commands is indicating below.

Code ASCII	Code Hexadecimal	Description	Page
<i>FF</i>	<b>0C</b>	Print and Return to Standard Mode.	<b>59</b>
<i>I8</i>	<b>CAN</b>	Cancel Print Data in Page Mode.	<b>70</b>
<i>ESC FF</i>	<b>1B 0C</b>	Print Data in Page Mode.	<b>70</b>
<i>ESC L</i>	<b>1B 4C</b>	Select Page Mode.	<b>85</b>
<i>ESC S</i>	<b>1B 53</b>	Select Standard Mode.	<b>87</b>
<i>ESC T n</i>	<b>1B 54 n</b>	Select Print Direction in Page Mode.	<b>87</b>
<i>ESC W xL xH dxL dxH dyL dyH</i>	<b>1B 57 xL xH dxL ...</b>	Set Print Area in Page Mode.	<b>89</b>
<i>GS \$ nL nH</i>	<b>1D 24 nL nH</b>	Set Absolute Vertical Print Position in Page Mode.	<b>110</b>
<i>GS \ nL nH</i>	<b>1D 5C nL nH</b>	Set relative Vertical Position in Page Mode.	<b>123</b>

## 7.13. Macro Commands

These commands are used to select and perform a user-defined sequence of printer operations.

Code ASCII	Code Hexadecimal	Description	Page
<i>GS :</i>	<b>1D 3A</b>	Select or Cancel Macro Definition.	<b>113</b>
<i>GS ^ r t m</i>	<b>1D 5E r t m</b>	Execute Macro.	<b>124</b>

## 7.14. Flash Firmware Download Commands

There are three ways to enter the download mode (maintenance mode).

1. Powering the printer up with switch *Cover position Open* and press and hold paper Feed button.
2. While the printer is running normally, send the command, “Switch to Boot Mode (1B 5B 7D)” to leave normal operation and enter the download mode.
3. If the Flash is 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. **Conditions Cover Switch and Paper Feed Button must in natural position during reboot to return to normal printer operation.**

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 the information downloaded from applications. Data is downloaded to flash memory to query the state of the firmware, calculate the firmware CRC and other functions.

These commands are used to load firmware into the printer:

Code ASCII	Code Hexadecimal	Description	Page
<i>ESC [ }</i>	<b>1B 5B 7D</b>	Switch to Boot Loader (Maintenance Mode).	<b>90</b>
<i>GS SOH</i>	<b>1D 01</b>	Return Flash Memory Size.	<b>99</b>
<i>GS STX nn</i>	<b>1D 02 nn</b>	Select Flash Memory Sector to Download.	<b>99</b>
<i>GS ACK</i>	<b>1D 06</b>	Get Flash Firmware CRC Status.	<b>101</b>
<i>GS BEL</i>	<b>1D 07</b>	Return Boot Sector CRC.	<b>102</b>
<i>GS SO</i>	<b>1D 0E</b>	Erase All Flash Contents Except Boot Sector.	<b>104</b>
<i>GS SI</i>	<b>1D 0F</b>	Return Main Program Flash CRC.	<b>104</b>
<i>GS DLE n</i>	<b>1D 10 n</b>	Erase Selected Flash Sector.	<b>105</b>
<i>GS DC1 al ah cl ch dl...dn</i>	<b>1D 11 al ah cl ch ...</b>	Download to Active Flash Sector.	<b>105</b>
<i>GS <sup>2</sup></i>	<b>1D FD</b>	Return Eeprom type.	<b>134</b>
<i>GS ■</i>	<b>1D FE</b>	Return Flash Memory Device ID.	<b>135</b>
<i>US SOH dl... dn</i>	<b>1F 01 dl... dn</b>	Erase Boot Sector + download new boot code.	<b>135</b>
<i>US BS n</i>	<b>1F 08 n</b>	Set New Boot “Loader” Code Size.	<b>147</b>
<i>US HT n</i>	<b>1F 09 dl... dn</b>	Same Command 1F 01 ... with reply Status.	<b>147</b>
<i>US LFI = n m</i>	<b>1F 0A 6C 3D n m</b>	Read Layer Information.	<b>150</b>
<i>US FF S A F n</i>	<b>1F 0C 53 41 46 n</b>	Reset/Set Boot Compatibility Check Before Download.	<b>155</b>

### 7.14.1. Main program Firmware Download Sequence (\*.bin file)

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 main program Firmware download sequence. Only the main steps are mentioned. Error checking and error recovery is not described:

- 1) Switch to Boot Mode (maintenance 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) 6) Reboot Printer

### 7.14.2. Boot program Firmware Download (\*.pbt file)

- 1) Transmit pbt file to the printer, no control sequence.
- 2) Printer Switch to Boot Mode (maintenance mode). (\*)
- 3) Printer Check the new firmware (CRC, Identify...).
- 4) If Ok. Printer Program The new Boot (pbt file).
- 5) Reboot Printer.

Nota:

(\*)Command maintenance mode (1B5B 7D) present into the pbt file.

### 7.15. Manage User Flash or SRAM -Memory Commands

Code ASCII	Code Hexadecimal	Description	Page
<i>GS " n</i>	<b>1D 22 n</b>	Set Memory Type (RAM/FLASH) for saving logo/user-font.	107
<i>GS @ n</i>	<b>1D 40 n</b>	Erase Sections of User Flash sector.	114
<i>US w NUL</i>	<b>1F 77 00</b>	Reply high block bytes size <i>SRam Memory Allocation</i> .	164
<i>US w</i>	<b>1F 77 01</b>	Reply the amount of flash memory <i>Logo/Font</i> section.	
<i>US w</i>	<b>1F 77 02</b>	Reply the amount of flash memory <i>Easy Font</i> section.	
<i>US w</i>	<b>1F 77 03</b>	Reply the amount of flash memory <i>User</i> section	

For more information, see chapter « SRAM MEMORY ALLOCATION »

### 7.16. User Data Storage Commands

Code ASCII	Code Hexadecimal	Description	Page
<i>ESC `m a2 a1 a0 d1 ... dn</i>	<b>1B 27 m a2 a1 a0 ...</b>	Write to User-defined Character Set.	76
<i>ESC 4 m a2 a1 a0</i>	<b>1B 34 a2 a1 a0</b>	Read from User Data Storage	79

### 7.17. Multi-Heat Mode Commands

In this mode maximum speed is fixed see table below.

Number multi-heat	2	3	4	5	6	7	8	9	10	11	12
Max. Speed (mm/s) <sup>0)</sup>	40	40	30	19	16	14	12	11	9	9	8

<sup>0)</sup>This is the maximum speed limit table Real speeds depend of: Temperature, power supply, density...

Code ASCII	Code Hexadecimal	Description	Page
<i>GS % n dH dL</i>	<b>1D 25 n dH dL</b>	Select or cancel Multi-Heat Mode.	111
<i>US ETX Ñ s dL dH</i>	<b>1F 03 A5 s dL dH</b>	Set Multi-Heat Mode in NVM.	143
<i>US BEL Ñ</i>	<b>1F 07 A5</b>	Read Configuration Multi-Heat Mode (NVM).	146

### 7.18. Peripheral Control Commands

Code ASCII	Code Hexadecimal	Description	Page
<i>ESC = n</i>	<b>1B 3D n</b>	Select Peripheral Device (For Multi-Drop).	80
<i>ESC c 5 n</i>	<b>1B 63 35 n</b>	Enable or Disable Panel Switch.	92
<i>US LF M S</i>	<b>1F 0A 4D 53</b>	Set Mass Storage Demo Mode	149

### 7.19. Position count Commands

Code ASCII	Code Hexadecimal	Description	Page
<i>DLE ACK</i>	<b>10 06</b>	Real time current position count transmission (USM).	<b>64</b>
<i>ESC +</i>	<b>1B 2B</b>	Increment current position count (USM).	<b>77</b>
<i>ESC z</i>	<b>1B 7A</b>	Clear current position count (USM).	<b>95</b>
<i>GS a n</i>	<b>1D 61 n</b>	Select or cancel unsolicited status Mode (USM)	<b>125</b>

### 7.20. Transaction Monitoring Commands

The following commands are provided as tools to monitor actual transaction completion, by providing synchronisation mechanisms with cut commands or other (see also USM).

Code ASCII	Code Hexadecimal	Description	Page
<i>US a n</i>	<b>1F 61 n</b>	Process Ticket Counter.	<b>160</b>
<i>US b</i>	<b>1F 62</b>	Request Ticket Counter.	<b>160</b>

### 7.21. Printer Configurations Commands

The following commands are designed to read or modify the controller configuration (store the new settings in EEPROM = NVM).

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.

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL →</i>	<b>1F 07 1A</b>	Read Power Supply Coefficient.	<b>146</b>
<i>US LF t = n</i>	<b>1F 0A 74 3D n</b>	Read Com Port specific Informations (Read: Diagnostic Form Heating time, Current ticket speed).	<b>151</b>
<i>US LF n</i>	<b>1F 0A 10 n</b>	Set Power Supply Coefficient.	<b>149</b>
<i>US LF è</i>	<b>1F 0A 8A</b>	Print Heating Time Table.	<b>152</b>
<i>US CR D UM</i>	<b>1F 0D 44 55 4D</b>	Dump NVM Memory Parameters.	<b>156</b>
<i>US t</i>	<b>1F 74</b>	Print Diagnostics Form.	<b>162</b>

## 7.21.1. Menu **\*\*Diagnostic Form\*\***

### 7.21.1.1. Reference Number Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS I @ SP</i>	<b>1D 49 40 20</b>	Write to NVM <i>Serial number</i> .	<b>117</b>
<i>GS I @ !</i>	<b>1D 49 40 21</b>	Write to NVM <i>Serial number</i> and print.	
<i>GS I @ #</i>	<b>1D 49 40 24</b>	Write to NVM <i>Class/model</i> .	
<i>GS I @ \$</i>	<b>1D 49 40 25</b>	Write to NVM <i>Class/model</i> and print.	
<i>GS u d0 ... d9</i>	<b>1D 75 d0 ... d9</b>	Store User <i>Revision Number</i> in NVM.	<b>133</b>

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS I @ #</i>	<b>1D 49 40 23</b>	Return <i>Serial Number</i> .	<b>117</b>
<i>GS I @ ^</i>	<b>1D 49 40 27</b>	Return <i>Class/model #</i> .	
<i>GS I n</i>	<b>1D 49 44</b>	Transmit <i>Printer Serial Number</i> .	
<i>GS x</i>	<b>1D 78</b>	Transmit User <i>Revision Number</i> .	<b>134</b>

### 7.21.1.2. Firmware (ID Rev CRC) Commands

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS I @ /</i>	<b>1D 49 40 2F</b>	Return <i>Boot firmware CRC</i> .	<b>117</b>
<i>GS I @ 7</i>	<b>1D 49 40 37</b>	Return <i>Client firmware CRC</i> .	
<i>GS I @ ù</i>	<b>1D 49 40 97</b>	Return <i>Boot firmware version</i> .	
<i>GS I @ ú</i>	<b>1D 49 40 A3</b>	Return <i>Flash firmware version</i> .	
<i>US LF I = n m</i>	<b>1F 0A 6C 3D n m</b>	Read Layer <i>Information</i> .	<b>150</b>

### 7.21.1.3. Hardware Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>US ETX EOT m</i>	<b>1F 03 04 m</b>	Set <i>Maximum Power Consumption</i> in NVM.	<b>137</b>
<i>US LF w = m</i>	<b>1F 0A 77 3D m</b>	Select or Cancel <i>Watchdog Mode</i> in NVM.	<b>151</b>

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS BS</i>	<b>1D 08</b>	Return <i>Static RAM Size</i> .	<b>102</b>
<i>GS HT</i>	<b>1D 09</b>	Return <i>CPU frequency (in MHz)</i> .	<b>102</b>
<i>GS VT</i>	<b>1D 0B</b>	Return <i>User Flash Size</i> .	<b>103</b>
<i>US BEL EOT</i>	<b>1F 07 04</b>	Read <i>Configuration Setting Max Power</i> .	<b>146</b>
<i>US BEL w</i>	<b>1F 07 77</b>	Read <i>Watchdog Status</i> .	

#### 7.21.1.4. Mechanism parameters

##### Write Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US ETX æ m</i>	<b>1F 03 91</b> <i>m</i>	Set Low Voltage Detection Mode in NVM.	<b>141</b>
<i>US VT NR J n</i>	<b>1F 0B 4E 52 4A</b> <i>n</i>	Set Print density in NVM.	<b>154</b>
<i>US FF S P F nL nH</i>	<b>1F 0C 53 50 46</b> ...	Set Printer Maximum Speed in NVM.	<b>155</b>

##### Read Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL æ</i>	<b>1F 07 91</b>	Read Config. Setting <i>Low Voltage Detection Mode</i> .	<b>146</b>
<i>US BEL E</i>	<b>1F 07 46</b>	Read Configuration <i>Print Speed</i> .	
<i>US BEL J</i>	<b>1F 07 4A</b>	Read Configuration <i>Print density Coefficient</i> .	

#### 7.21.1.4.1. Multi-Heat Mode Commands

##### Write Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>GS % n dH dL</i>	<b>1D 25</b> <i>n dH dL</i>	Select or cancel Multi-Heat Current Mode.	<b>111</b>
<i>US ETX Ñ s dL dH</i>	<b>1F 03 A5</b> <i>s dL dH</i>	Set Multi-Heat Mode in NVM.	<b>143</b>

##### Read Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL Ñ</i>	<b>1F 07 A5</b>	Read Configuration Multi-Heat Mode in NVM.	<b>146</b>

#### 7.21.1.4.2. Motor Current Commands

##### Write Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US LF ENQ s n m</i>	<b>1F 0A 05</b> <i>s n m</i>	Write PWM Current Value.	<b>148</b>
<i>US LF Ü l m</i>	<b>1F 0A 9A</b> <i>l m</i>	Save Current (mA) Paper Feed Motor in NVM.	<b>153</b>

##### Read Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US LF 05 n NUL NUL</i>	<b>1F 0A 05</b> <i>n 00 00</i>	Read PWM Current Value.	<b>148</b>
<i>US LF ø</i>	<b>1F 0A 9B</b>	Read Current Paper Feed Motor.	<b>154</b>

#### 7.21.1.4.3 Sensors Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS s m n</i>	<b>1D 73 m n</b>	Store Selected Sensor Threshold in NVM.	<b>132</b>
<i>US ETX ě m</i>	<b>1F 03 89 m</b>	Set Cover sensor option in NVM.	<b>140</b>

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL s n</i>	<b>1F 07 73 n</b>	Read Configuration <i>Sensor threshold</i> .	<b>146</b>
<i>US BEL ě</i>	<b>1F 07 89</b>	Read Configuration Setting <i>Set Cover Sensor Option</i> .	

#### 7.21.1.5 Communication interface Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS a n</i>	<b>1D 61 n</b>	Select or Cancel Unsolicited Status Mode (USM).	<b>125</b>
<i>US STX n1 n2 n3 n4 n5 n6</i>	<b>1F 02 n1 ... n5 n6</b>	Set Communication Parameters in NVM.	<b>136</b>
<i>US ETX Ě m</i>	<b>1F 03 90 m</b>	Set Fault Recovery Mode in NVM.	<b>140</b>
<i>US ETX Ø m</i>	<b>1F 03 9D m</b>	Set option to enable count trigger in USM in NVM.	<b>142</b>
<i>US ETX Ě m</i>	<b>1F 03 D3 m</b>	Set Driver USB Easy Mode in NVM.	<b>144</b>
<i>US LFR = n</i>	<b>1F 0A 52 3D n</b>	Set Rx Buffer Size in NVM.	<b>150</b>

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL DLE</i>	<b>1F 07 10</b>	Read Configuration read <i>Communication Parameters</i> .	<b>146</b>
<i>US BEL Ě</i>	<b>1F 07 90</b>	Read Configuration Setting <i>Fault Recovery</i> .	
<i>US BEL Ø</i>	<b>1F 07 9D</b>	Read Configuration Setting <i>count triggers USM Mode</i> .	
<i>US BEL Ě</i>	<b>1F 07 D3</b>	Read Configuration Driver USB Easy Mode.	

#### 7.21.1.6 User Flash Storage Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS " Unln2</i>	<b>1D 22 55 n1 n2</b>	Flash Memory User Sector allocation.	<b>108</b>
<i>GS @ n</i>	<b>1D 40 n</b>	Erase User Flash Sector.	<b>114</b>
<i>US ETX Ě n</i>	<b>1F 03 D8 n</b>	Set User data storage Byte Mode.	<b>144</b>

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL Ě</i>	<b>1F 07 D8</b>	Read Configuration Setting User data storage byte mode.	<b>164</b>
<i>US w n</i>	<b>1F 77 n</b>	Return User flash memory sectors allocation status.	<b>164</b>

### 7.21.1.7 Print Options Commands

- Write Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US ETX NUL n</i>	<b>1F 03 00</b> <i>n</i>	Set Diagnostic Mode in non-volatile memory.	<b>137</b>
<i>US ETX ô m</i>	<b>1F 03 93</b> <i>m</i>	Set Carriage Return Usage in non-volatile memory.	<b>141</b>
<i>US ETX ö m</i>	<b>1F 03 94</b> <i>m</i>	Set Lines Per Inch Default Setting in NVM.	<b>142</b>

- Read Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL NUL</i>	<b>1F 07 00</b>	Read Configuration Setting <i>Diagnostic Mode value</i> .	<b>146</b>
<i>US BEL ô</i>	<b>1F 07 93</b>	Read Configuration Setting <i>Carriage Return Usage</i> .	
<i>US BEL ö</i>	<b>1F 07 94</b>	Read Configuration Setting <i>Default LPI</i> .	

### 7.21.1.8 Fonts Commands

- Write Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US ETX VT m</i>	<b>1F 03 0F</b> <i>m</i>	Set Default Font in non-volatile memory.	<b>138</b>

- Read Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL VT</i>	<b>1F 07 0F</b>	Read Default Font configuration.	<b>146</b>

### 7.21.1.9 Code Pages Commands

- Write Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US ETX Ç m</i>	<b>1F 03 80</b> <i>m</i>	Set Default Font in non-volatile memory.	<b>138</b>

- Read Configuration:

Code ASCII	Code Hexadecimal	Description	Page
<i>US BEL Ç</i>	<b>1F 07 80</b>	Read Default Code Page configuration.	<b>146</b>

### 7.21.1.10. User Tallies Commands

▪ **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS I @ C</i>	1D 49 40 80	Write to NVM <i>Receipt lines</i> tally.	117
<i>GS I @ ù</i>	1D 49 40 81	Write to NVM <i>Receipt lines</i> tally and print.	
<i>GS I @ é</i>	1D 49 40 82	Clear to NVM <i>Receipt lines</i> tally to 0.	
<i>GS I @ É</i>	1D 49 40 90	Write to NVM <i>Hours on</i> tally.	
<i>GS I @ œ</i>	1D 49 40 91	Write to NVM <i>Hours on</i> tally and print.	
<i>GS I @ Æ</i>	1D 49 40 92	Clear to NVM <i>Hours on</i> tally.	
<i>GS I @ ñ</i>	1D 49 40 A4	Write to NVM <i>Flash cycles</i> tally.	
<i>GS I @ Ñ</i>	1D 49 40 A5	Write to NVM <i>Flash cycles</i> tally and print.	
<i>GS I @ ª</i>	1D 49 40 A6	Clear to NVM <i>Flash cycles</i> tally.	
<i>GS I @ ¼</i>	1D 49 40 AC	Write to NVM <i>Cover openings</i> tally	
<i>GS I @ ı</i>	1D 49 40 AD	Write to NVM <i>Cover openings</i> tally and print.	
<i>GS I @ «</i>	1D 49 40 AE	Clear to NVM <i>Cover openings</i> tally.	
<i>GS I @ [</i>	1D 49 40 B2	Set maximum temperature tally to -273 (clear tally).	
<i>GS I @  </i>	1D 49 40 B4	Write to NVM <i>Reboot device</i> tally.	
<i>GS I @ Á</i>	1D 49 40 B5	Write to NVM <i>Reboot device</i> tally and Print.	
<i>GS I @ À</i>	1D 49 40 B6	Clear to NVM <i>Reboot device</i> tally.	
<i>GS I @ Ī</i>	1D 49 40 D8	Write to NVM <i>Meter print</i> tally.	
<i>GS I @ ]</i>	1D 49 40 D9	Write to NVM <i>Meter print</i> tally and Print.	
<i>GS I @ ı</i>	1D 49 40 DA	Clear to NVM <i>Meter print</i> tally.	

▪ **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
<i>GS I @ á</i>	1D 49 40 83	Return <i>Receipt lines</i> tally in NVM.	117
<i>GS I @ ô</i>	1D 49 40 93	Return <i>Hours on</i> tally in NVM.	
<i>GS I @ °</i>	1D 49 40 A7	Return <i>Flash cycles</i> tally in NVM.	
<i>GS I @ »</i>	1D 49 40 AF	Return <i>Cover openings</i> tally in NVM.	
<i>GS I @ [</i>	1D 49 40 B3	Return <i>Temperature</i> tally in NVM.	
<i>GS I @ Á</i>	1D 49 40 B7	Return <i>Reboot device</i> tally in NVM.	
<i>GS I @ [</i>	1D 49 40 DB	Return <i>Meter print</i> tally in NVM.	

### 7.22. Reset Configurations Command

Code ASCII	Code Hexadecimal	Description	Page
<i>US CR C L E n</i>	1F 0D 43 4C 45 n	Reset Non-Volatile Memory.	156

## 8. COMMAND DESCRIPTION

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## 8.2. 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).

[DBG] = Debug command (ASCII Title).

[\*] = Same Command of Asteron RS232 controller Board (ASCII Title).

### 8.3. List of control commands

**HT - [MP]**

**09**

**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 n1 n2 ... 00).

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. The print position is reset to column one after each line.

Print initialization sets 32 tabs at column 9, 17, 25...

**Note:** Tab treats the left margin as column one, therefore changes to the left margin will move the tab position.

**LF - [MP] [\*]**

**0A**

**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.

**FF - [MP]**

**0C**

**Print and Return to Standard mode**

**Synopsis:** Print and return to standard mode.

**ASCII** FF

**Hexadecimal** 0C

**Decimal** 12

**Description:** When printing is completed, values for Select Print Direction in Page Mode (ESC T) and Set Print Area in Page Mode (ESC W) and the position for buffering character data are set. Buffered data is not deleted from the printer.

The processed data is printed and the printer returns to standard mode. The developed data is deleted after being printed. For more information see Page Mode in this document.

**Note:** This command is enabled only in page mode.

**CR - [MP] [\*]**

**0D**

**Activate Carriage Return**

**Synopsis:** Carriage return.

**ASCII** CR

**Hexadecimal** 0D

**Decimal** 13

**Description:** Prints one line from the buffer and feeds paper one line. The printer can be set through the configuration menu to ignore or use this command.

Some applications expect the command to be ignored while others use it as print command.

**Note:** See Ignoring/Using the Carriage Return in *Diagnostics* for more information or code (1F 03 93 n).

**DLE - [MP]**

**10**

**Clear Printer**

**Synopsis:**

**ASCII** DLE

**Hexadecimal** 10

**Decimal** 16

**Description:** Clears the print line buffer without printing and sets the printer to the following condition.

**Default:** Single Wide, Single-High and Left-Aligned characters.

Number of Columns Width 24 <sup>(1)</sup>

Character Pitch (Elite) 12.7 CPI <sup>(1)</sup>

Extra Dot Rows 0

Character Set (16\*24) Default <sup>(1)</sup>

Code Page (437) Default <sup>(2)</sup>

Printing Position Column One.

<sup>(1)</sup>Mode resident user m=0 see code Set or Read default font 1F03 0Fm or 1F 07 0F.

<sup>(2)</sup>Mode See code Set or Read 1F03 80m or 1F 07 80.

**DLE EOT n - [MP]**

**10 04 n**

**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:	Hex:	Dec:	
	01	1	Transmit printer status.
	02	2	Transmit communication interface busy status.
	03	3	Transmit error status.
	04	4	Transmit receipt paper status.
	76	118	Transmit paper Status In Real Time (Same command reply 1B 76).

**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 (tables below):**

**"DLE EOT" n = 1 = Transmit Printer Status**

Bit	Status	Hex	Decimal	Function
0	Off	00	0	No Used. Fixed to Off.
1	On	02	2	No Used. Fixed to On.
2	On	00	4	No Used. Fixed to On.
3	Off	00	0	Not busy at the communication interface.
	On	08	8	Printer is Busy at the communication interface.
4	On	10	16	No Used. Fixed to On.
5	Off	00	0	Received Communication buffer empty.
	On	08	32	Received Communication buffer no empty.
6	-	-	-	Undefined.
7	Off	00	0	No Used. Fixed to Off.

**“DLE EOT” n = 2 = Transmit communication interface Busy Status**

Bit	Status	Hex	Decimal	Function
0	Off	00	0	No Used. Fixed to Off.
1	On	02	2	No Used. Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	No Used. Fixed to Off.
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.

**“DLE EOT” 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	Fixed to Off.
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 temperature and power supply voltage are in range.
	On	40	64	Thermal print head temperature or power supply voltages are out of range.
7	Off	00	0	Fixed to Off

**“DLE EOT” 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	Undefined.
3	Off	00	0	Undefined.
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

“DLE EOT” n = 118 = Transmit Paper Status In Real Time (Same command reply 1B 76)

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Undefined.
1	Off	00	0	Cover closed.
	On	02	2	Cover Open.
2	Off	00	0	Receipt Paper Present.
	On	04	4	Receipt Paper Out.
3	Off	00	0	Undefined.
4	Off	00	0	Fixed to Off.
5	Off	00	0	Temperature in valid range.
	On	20	32	Temperature too hot or too cold.
6	Off	00	0	Voltage In valid range.
	On	40	64	Voltage Too high or too low.
7	Off	00	0	Fixed to Off.

**DLE ENQ n - [MP]**

**10 05 n**

**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. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this operand.

**Notes:** This command will attempt recovery from any fault that prevents printing.

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

Recovering from a under or over voltage condition is only accomplished by waiting until voltage returned to its operating voltage range.

This command will be ignored until manual intervention has occurred to clear the fault condition.

**DLE ACK - [MP]**  
**10 06**  
**Real Time Current position count transmission**

**Synopsis:** Real time current position.

**ASCII** DLE ACK

**Hexadecimal** 10 06

**Decimal** 16 6

**Description:** Immediately returns a single byte containing the current position count.

The count is calculated by adding the value for each of the bits that equal one (see table below).

**Notes:** The maximum range of the count will be from 0 – 63.

The returned count has bits 4 and 7 fixed to zero to avoid confusion with other returned data including XOn and XOff.

<b>“DLE ACK” RETURNED COUNTER DEFINITION</b>			
<b>Bit</b>	<b>Function</b>	<b>Value</b>	
		<b>0</b>	<b>1</b>
0	Bit 0 of count (LSB)	0	1
1	Bit 1 of count	0	2
2	Bit 2 of count	0	4
3	Bit 3 of count	0	8
4	fixed	Always 0	-
5	Bit 4 of count	0	16
6	Bit 5 of count (MSB)	0	32
7	fixed	Always 0	-

**DLE EM n - [MP]**

**10 19 n**

**Extended Real Time Status Transmission**

**Synopsis:** Immediately transmits the selected status.

<b>ASCII</b>	DLE	EM	n
<b>Hexadecimal</b>	<b>10</b>	<b>19</b>	<b>n</b>
<b>Decimal</b>	16	25	n

**Operand:** n = Status Select

Limit	Hex:	Dec:	
0	0	0	Memory Allocation Status (reply 1 byte).
1	1	1	Printer Status (reply 1 byte).
2	2	2	Error Status (reply 1 byte).
3	3	3	No defined (Reply 1 byte = 0x80).
4	4	4	Environmental Status (reply 1 byte).
5	5	5	Print buffer Status (reply 2 bytes).
6	6	6	Communication receives buffer status (reply 2 bytes).
7	7	7	Print command processing data (reply 2 bytes).
8	8	8	Clear counter of processed print commands (no reply).
9	9	9	Clear SRAM and Flash memory allocation error (no reply).
A	10	10	Return serial number (reply 10 bytes).
B	11	11	Return printer software revision (reply 8 bytes).
C	12	12	Return model number (reply 15 bytes).

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

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

The awaiting error recovery command status indicates that a fault condition existed and was cleared. The "DLE ENQ" or "GS ETX" command must be sent to clear the fault condition.

The counter of Processed Print Commands "DLE EM 07" is incremented when processing any command that generates a paper motion, i.e. print or paper feed commands.

Commands DLE EM 05, 06, 07, 08 are designed to help user application monitor the contents of main buffers, for example in default condition.

"DLE EM" n = 0: MEMORY ALLOCATION STATUS			
Bit	Function	Value	
		0	1
0	Flash Memory Error	OK	Failure
1	Sram Memory Error	OK	Failure
2	Undefined	-	-
3	Undefined	-	-
4	Fixed	Always 0	-
5	Undefined	-	-
6	Undefined	-	-
7	Fixed	-	Always 1

"DLE EM" n = 1: PRINTER STATUS			
Bit	Function	Value	
		0	1
0	Paper status	Present	Out
1	Reserved	-	-
2	Reserved	-	-
3	Reserved	-	-
4	Fixed	Always 0	-
5	Reserved	-	-
6	Printer reset <sup>(1)</sup>	Reported	Reset
7	Fixed	-	Always 1

<sup>(1)</sup>The printer reset bit will be zero after the reset condition has been reported to the host for the first time.

"DLE EM" n = 2: ERROR STATUS			
Bit	Function	Value	
		0	1
0	Reserved	-	-
1	Reserved	-	-
2	Reserved	-	-
3	Door Status	Closed	Open
4	Fixed	Always 0	-
5	Reserved	-	-
6	Reserved	-	-
7	Fixed	-	Always 1

"DLE EM" n = 4: ENVIRONMENTAL STATUS			
Bit	Function	Value	
		0	1
0	<sup>(1)</sup> Power Supply Voltage Status	OK	Failure
1	<sup>(2)</sup> Print head Temperature Status	OK	Failure
2	Undefined	-	-
3	Undefined	-	-
4	Fixed	Always 0	-
5	Undefined	-	-
6	Undefined	-	-
7	Fixed	-	Always 1

<sup>(1)</sup>Correct Voltage range is +4.20 ~ +9.50V Failure → +5.0 ~ +9.10V

<sup>(2)</sup>Correct Temperature range is -1.01°C ~ +67.7°C Failure → -0.16°C ~ +65.25°C

"DLE EM" n = 5: PRINT BUFFER STATUS	
Byte	Function
0	(LSB) Number of raster left in Print Buffer
1	(MSB) Number of raster left in Print Buffer

"DLE EM" n = 6: COMMUNICATION RECEIVE BUFFER STATUS	
Byte	Function
0	(LSB) Number of bytes left in Receive Buffer
1	(MSB) Number of bytes left in Receive Buffer

"DLE EM" n = 7: PRINT COMMANDS PROCESSING STATUS	
Byte	Function
0	(LSB) Number of processed Print Commands
1	(MSB) Number of processed Print Commands

"DLE EM" RETURNED STATUS DEFINITION	
<b>n = 8: CLEAR COUNTER OF PROCESSED PRINT COMMANDS</b>	

"DLE EM" RETURNED STATUS DEFINITION	
<b>n = 9: CLEAR SRAM AND FLASH MEMORY ALLOCATION ERROR</b>	

"DLE EM" RETURNED STATUS DEFINITION <i>n = 10: PRINTER SERIAL NUMBER</i>	
Byte	Function
0-9	Printer Serial Number

"DLE EM" RETURNED STATUS DEFINITION <i>n = 11: PRINTER SOFTWARE REVISION</i>	
Byte	Function
0-17	Boot and Flash Software Revision.

"DLE EM" RETURNED STATUS DEFINITION <i>n = 12: MODEL NUMBER</i>	
Byte	Function
0-14	Printer Model Number

<b>DC1 n1...nX - [MP] [*]</b> <b>11 n1...nX</b> <b>Print Raster Graphics</b>
--

**Synopsis:** Print raster graphics.

**ASCII** DC1 n...nX

**Hexadecimal** 11 n...nX

**Decimal** 17 n1...nX

**Value of n:** n1...nX = 48 Data bytes.

**Range:** 0 – 255

**Description:** Prints one row of data. n1 ... nX: bytes describing the line to print nX=48.

**Notes:** See also command Set GFX Print Area Width modified nX <1F 0A 8B n>.

Raster graphics is not available in Page Mode.

<b>DC2 - [MP]</b> <b>12</b> <b>Select Double-Wide Characters</b>
--

**Synopsis:** Select Double-Wide Characters.

**ASCII** DC2

**Hexadecimal** 12

**Decimal** 18

**Description:** Prints double-wide characters. The printer is reset to single-wide mode after a line has been printed or the Clear Printer (10) command is received. Double-wide characters may be used in the same line with single-wide characters.

**Note :** Double-wide characters may not be used in the same line with single or double-density graphics.

**DC3 - [MP]**

**13**

**Select Single-Wide Characters**

**Synopsis:** Select Single-Wide Characters.

**ASCII** DC3

**Hexadecimal** 13

**Decimal** 19

**Description:** Prints single-wide characters. Single-wide characters may be used in the same line with double-wide characters.

**Note :** Single-wide characters may not be used in the same line with single or double-density graphics.

**DC4 n - [MP]**

**14 n**

**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** 0-255

**Description:** Feeds the paper *n* lines at the current line height without printing.

**Note:** Ignored if not at start of line.

**NAK n - [MP]**

**15 n**

**Feed n Dots Rows**

**Synopsis:** Feed n dots rows.

**ASCII** NAK n

**Hexadecimal** 15 n

**Decimal** 21 n

**Value of n:**  $n/203$  inch

**Range:** 0 – 255

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

**SYN n - [MP]**

**16 n**

**Add n Extra dot Rows**

**Synopsis:** Add n extra dot rows.

**ASCII** SYN n

**Hexadecimal** 16 n

**Decimal** 22 n

**Value of n:** Number of extra dot rows

**Range:** 0-16

**Default:** 3 extra dot rows.

**Description:** Adds *n* extra dot rows (*n*/203 inch, *n*/8 mm) to the character height to increase space between print lines or decrease the number of lines per inch.

**Formulas:** The following table shows the relationship between the number of lines per inch and each extra dot row added:

Extra Rows	Lines Per Inch	Dot Rows
0	8.5	24
1	8.1	25
2	7.8	26
3	7.5	27
4	7.2	28
5	7.0	29
6	6.8	30
7	6.5	31
8	6.3	32

Extra Rows	Lines Per Inch	Dot Rows
9	6.1	33
10	6.0	34
11	5.8	35
12	5.6	36
13	5.5	37
14	5.3	38
15	5.2	39
16	5.1	40

**ETB - [MP]**

**17**

**Print one line**

**Synopsis:** Print.

**ASCII** ETB

**Hexadecimal** 17

**Decimal** 23

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

**CAN - [MP]**

**18**

**Cancel Print Data in Page mode**

**Synopsis:** Cancel print data in page mode.

**ASCII** CAN

**Hexadecimal** 18

**Decimal** 24

**Description:** Deletes all the data to be printed in the “page” area. Any data from the previously selected “page” area that is also part of the current data to be printed is deleted.

**Note:** This command is only used in page mode.

**ESC FF - [MP]**

**1B 0C**

**Print Data in Page Mode**

**Synopsis:** Print Data

**ASCII** ESC FF

**Hexadecimal** 1B 0C

**Decimal** 27 12

**Description:** Collectively prints all buffered data in the printing area.  
After printing, the printer does not clear the buffered data and sets values for Select Print Direction in Page Mode (ESC T) and Set Print Area in Page Mode (SUB ESC W), and sets the position for buffering character data.

**Note :** This command is enabled only in page mode.

**ESC DC2 - [MP]**

**1B 12**

**Select 90 Degree Counter- reverse Clockwise Rotated Print**

**Synopsis:** Rotate characters counter-clockwise.

**ASCII** ESC DC2

**Hexadecimal** 1B 12

**Decimal** 27 18

**Description:** Rotates characters 90 degrees counter-clockwise. The command remains in effect until the printer is reset or until a Clear Printer (10) or Cancel Rotated Print (1B 56) command is received.

**ESC DC4 n - [MP]**  
**1B 14 n**  
**Set Column**

**Synopsis:** Set Column.

**ASCII** ESC DC4 n

**Hexadecimal** **1B 14 n**

**Decimal** 27 20 n

**Limit n :** 1-24 = Standard pitch (Elite character).  
1-32 = Compressed pitch (Pica character).

**Default :** n = 1 (decimal)

**Description:** Prints the first character of the next print line in column *n*. It must be sent for each line not printed at column one. The value of *n* is set to one after each line.

**Note:** This command cannot be used with Single- or Double-Density graphics.

**ESC SYN n - [MP] [\*]**  
**1B 16 n**  
**Select pitch (Column Width)**

**Synopsis:** Select pitch for Column width.

**ASCII** ESC SYN n

**Hexadecimal** **1B 16 n**

**Decimal** 27 22 n

**Value of n** 0 = Standard pitch.  
1 = Compressed pitch.

**Default** 0 (Standard pitch).

**Description:** Selects the character pitch for a print line.

**Formulas** The following table provides the print characteristics for both pitches

Pitch	Columns	CPI
Standard (Elite)	24	12.7
Compressed (pica)	32	16.9

**ESC SP n - [MP]**

**1B 20 n**

**Set Right-Side Character Spacing**

**Synopsis:** Set right-side character spacing.

<b>ASCII</b>	ESC	SP	n
<b>Hexadecimal</b>	<b>1B</b>	<b>20</b>	<b>n</b>
<b>Decimal</b>	27	32	n

**Range of n :** 0 - 32

**Default** 0

**Description:** Sets the right side character spacing to [*n* x horizontal or vertical motion units]. Values for this command are set independently in standard and page mode.

The units of horizontal and vertical motion are specified by the Set Horizontal and Vertical Minimum Motion Units (GS P) command. Changes in the horizontal or vertical units do not affect the current right side character spacing. When the horizontal or vertical motion unit is changed by the Set Horizontal and Vertical Minimum Motion Units (GS P) command the value must be in even units and not less than the minimum amount of horizontal movement.

In standard mode the horizontal motion unit is used.

In page mode the horizontal or vertical motion unit differs and depends on the starting position of the printable area. When the starting printing position is the upper left or lower right of the printable area (set by Select Print Direction in Page Mode, ESC T) the horizontal motion unit (*x*) is used. When the starting printing position is the upper right or lower left of the printable area (set by Select Print Direction in Page Mode, ESC T) the vertical motion unit (*y*) is used.

ESC ! n - [MP] [*]
1B 21 n
Select Print Mode

**Synopsis:** Select print mode.

**ASCII** ESC ! n

**Hexadecimal** 1B 21 n

**Decimal** 27 33 n

**Value of n** See table above.

**Range of n** 0-255

**Default** 0 (for bits 1, 3, 4, 5, 7).

**Description:** Selects the print mode: Standard, compressed, emphasized, underlined, double high or double wide.

**Value of n**

Bit <sup>1</sup>	Function	0	1
Bit 0	Pitch (See chart below)	Standard Pitch	Compressed Pitch
Bit 3	Emphasized Mode	Cancelled	Set
Bit 4	Double High	Cancelled	Set
Bit 5	Double Wide	Cancelled	Set
Bit 7	Underlined Mode	Cancelled	Set (bar thickness = 2)

<sup>1</sup> Bits 1, 2 and 6 are not used "0".

Pitch	Columns 58.0 mm Paper	CPI
Standard	24	12.7
Compressed	32	16.9

**ESC \$ nL nH - [MP]**

**1B 24 nL nH**

**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:**  $mn$  = 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.

If the Set horizontal and vertical Minimum Motion Units command (1D 50) is Used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Absolute Print Position) will be interpreted accordingly.

Any setting that exceeds the printable area is ignored.

**Note:** This command is also used in graphics mode. See Graphics Commands in this document for more information.

For more information, see the description of the Set horizontal and vertical Minimum Motion Units Command (1D 50) in this document.

**Formulas:** The example shows how to calculate 280 dots as the absolute starting position :

$280/256 = 1$ , remainder of 24                       $nL = 24$                        $nH = 1$

**ESC % n - [MP]**

**1B 25 n**

**Select Character Set**

**Synopsis:** Select character set.

**ASCII** ESC % n

**Hexadecimal** 1B 25 n

**Decimal** 27 37 n

**Value of n :** 0 = Code Page 437.

1 = User Defined (RAM).

2 = Code Page 850.

**Range of n :** 0 – 2

**Default :** 0 (Code Page 437).

**Description:** Selects the character set. When an undefined RAM character is selected, current active ROM Code Page character is used.

ESC & s c1 c2 n1 d1 ... nn dn - [MP]

1B 26 s c1 c2 n1 d1 ... nn dn

Define User-Defined Character Set

**Synopsis:** Defines characters download in RAM.

ASCII	ESC	&	s	c1	c2	[n1]	d1...	...	[nn]	dn
Hexadecimal	1B	26	s	c1	c2	[n1]	d1	...	[nn]	dn
Decimal	27	38	s	c1	c2	[n1]	d1	...	[nn]	dn

**Value and Ranges :**

s = 3, the number of bytes (vertically) in the character cell.

c = the ASCII codes of the first (c1) and last (c2) characters respectively

c1 = Hex 20-FF (20 is always printed as a space).

c2 = Hex 20-FF (20 is always printed as a space).

To define only one character, use the same code for both c1 and c2.

n = the number of dot columns for the nth character as specified by [n1] ... [nn]

n = 1-16.

d = the column data for the nth character as specified by d1 ... dn

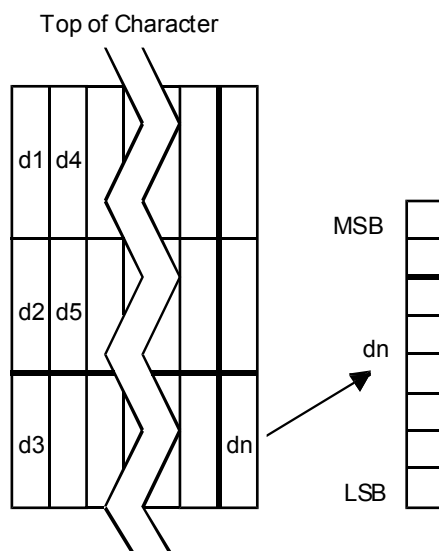
The number of bytes for a character cell is s x n1.

The bytes are printed down and across each cell. See the illustration below.

**Description:** Defines and enters downloaded characters into RAM. The command may be used to overwrite single characters. User-defined characters are available until power is turned off or the Initialize printer command (1B 40) is received.

**Note:** Any invalid byte (s, c1, c2, n1, n2) aborts the command.

See (1D 22 n) "Select memory type" to save User Defined characters.



**ESC ' m a2 a1 a0 d1 ...dm - [MP]**

**1B 27 m a2 a1 a0 d1 ... dm**

**Write to User Data Storage**

**Synopsis:** Write to user data storage.

<b>ASCII</b>	ESC	'	m	a2	a1	a0	d1	...	dm
<b>Hexadecimal</b>	<b>1B</b>	<b>27</b>	<b>m</b>	<b>a2</b>	<b>a1</b>	<b>a0</b>	<b>d1</b>	...	<b>dm</b>
<b>Decimal</b>	27	39	m	a2	a1	a0	d1	...	dm

**Value of :**

**m** 0 – 255 (Number of bytes).  
Up to 256 bytes (256 for m=0) may be written.

**Addr**  $(65536 \times a2) + (256 \times a1) + a0$

**Description:** Writes *m* bytes of data to the user data storage flash page at the address specified. The printer waits for *m* bytes of data following the 3-bytes address, *addr*.

**Exception:** If any of the memory locations addressed by this command are not currently erased, the command is not executed.

See also command (1F 03 D8), selected *Byte mode* for user Data storage. In *Two bytes mode*, the sector size is modulo 64Kbytes. But *m* (number of bytes) is only an even value, else the command is ignored. In *One byte mode*, the sector size is modulo 32Kbytes, and *m* (number of bytes) can an even or odd value.

**ESC \* m n1 n2 d1 ...dn - [MP]**

**1B 2A m n1 n2 d1 ...dn**

**Select Bit Image Mode**

**Synopsis:** Select bit image mode.

<b>ASCII</b>	ESC	*	m	n1	n2	d1	...	dn
<b>Hexadecimal</b>	<b>1B</b>	<b>2A</b>	<b>m</b>	<b>n1</b>	<b>n2</b>	<b>d1</b>	...	<b>dn</b>
<b>Decimal</b>	27	42	m	n1	n2	d1	...	dn

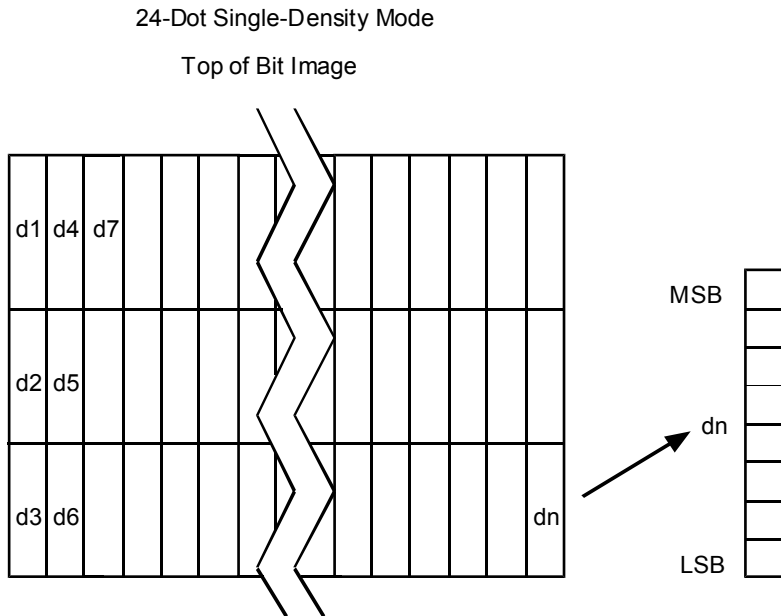
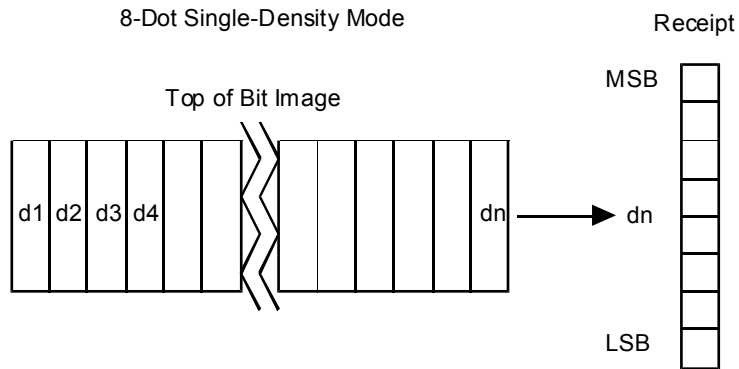
<b>Value of m</b>	<b>Mode</b>	<b>No. of Dots (Vertical)</b>	<b>No. of Dots (Horizontal)</b>	<b>No. of Dots/Line</b>
0	8 Dot Single Density	8 (68 DPI)	0-224 (101 DPI)	8 x 224
1	8 Dot Double Density	8 (68 DPI)	0-448 (203 DPI)	8 x 448
32	24 Dot Single Density	24 (203 DPI)	0-224 (101 DPI)	24 x 224
33	24 Dot Double Density	24 (203 DPI)	0-448 (203 DPI)	24 x 448

<b>Value of n</b>	<b>(8-Dot Single Density Mode)</b>	<b>(24-Dot Single Density Mode)</b>
	$n1 + (256 \times n2)$	$3 \times [n1 + (256 \times n2)]$

**Value of d** Number of Bytes of Data (Printed Down, Then Across)

**Description:** Sets the print resolution and enters one line of graphics data into the print buffer. Excess data is accepted but ignored. Any print command is required to print the data, after which the printer returns to normal processing mode.

**Note :** See below the illustrations for graphic representations of the bit image.



**ESC + - [MP]**

**1B 2B**

**Increment Current Position Count**

**Synopsis:** Increment current position count.

**ASCII** ESC +

**Hexadecimal** 1B 2B

**Decimal** 27 43

**Description:** A buffered command that increments the current position count.

**Note :** If the count is 63 when it is incremented, the count will become 0.

**ESC - n - [MP]**  
**1B 2D n**  
**Select or Cancel Underline Mode**

**Synopsis:** Select or cancel underlined mode.

<b>ASCII</b>	ESC	-	n
<b>Hexadecimal</b>	<b>1B</b>	<b>2D</b>	<b>n</b>
<b>Decimal</b>	27	45	n

**Value of n:**

0-48 = Cancel underline mode.

1- 7,49-55 = Select underline mode and bar thickness in number of dots.

**Default:** 0-48 (Cancel underline mode).

**Description:** Turns underline mode on or off. Underlines cannot be printed for spaces set by the Horizontal Tab, Set Absolute Start Position, or Set Relative Print Position commands.

Underline mode may also be turned ON and OFF with the Select Print Mode(s) command (1B 21). However with that command the bar thickness is not selectable.

**Note :** This command is ignored if *n* is out of the specified range.

**ESC . m n rL rH d1 ... dn - [MP]**  
**1B 2E m n rL rH d1 ... dn**  
**Print Advanced Raster Graphics**

**Synopsis:** Print advanced raster graphics.

<b>ASCII</b>	ESC	.	m	n	rL	rH	d1	...	dn
<b>Hexadecimal</b>	<b>1B</b>	<b>2E</b>	<b>m</b>	<b>n</b>	<b>rL</b>	<b>rH</b>	<b>d1</b>	<b>...</b>	<b>dn</b>
<b>Decimal</b>	27	46	m	n	rL	rH	d1	...	dn

**Value of m :** Horizontal offset from left margin = 8 x m dots.

**Value of n :** Number of data bytes that compose the raster.

**Value of r :** Number of times the raster has to be printed = 256 x rH + rL.

**d1 ... dn :** Data bytes.

**Range:**  $0 \leq m \leq 48$

$0 \leq n \leq 48$

$0 \leq r \leq 65535$

$0 \leq d1 \dots dn \leq 255$

**Description:** Prints a horizontal raster of graphics data one or multiple times. Horizontal offset and number of data bytes are variable and specified by parameters.

**Note :** Advanced Raster graphics is not available in Page Mode.

**ESC 2 - [MP]**
**1B 32**
**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).

**ESC 3 n - [MP]**
**1B 33 n**
**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.

**ESC 4 m a2 a1 a0 - [MP]**
**1B 34 m a2 a1 a0**
**Read from User Data Storage**

**Synopsis:** Read from user data storage.

**ASCII** ESC 3 m a2 a1 a0

**Hexadecimal** **1B 34 m a2 a1 a0**

**Decimal** 27 51 m a2 a1 a0

**Value of m :** 0-255 (Number Bytes)  
Up to 256 bytes (256 for  $m=0$ ) may be reads.

**Addr :**  $(65536 \times a2) + (256 \times a1) + a0$

**Description:** Reads  $m$  bytes of data to the user data storage flash page at the address specified.  
End read send a Carriage Return (0x0D).

**ESC : 0 0 0 - [MP]**  
**1B 3A 30 30 30**  
**Copy Character Set from Rom to Ram**

**Synopsis:** Copy character set from Rom to Ram.

<b>ASCII</b>	ESC	:	0	0	0
<b>Hexadecimal</b>	<b>1B</b>	<b>3A</b>	<b>30</b>	<b>30</b>	<b>30</b>
<b>Decimal</b>	27	58	48	48	48

**Default :** Current active ROM Code Page.

**Description:** Copies characters in the active ROM set to RAM. Use this command to re-initialize the User-Defined Character Set.

**Note:** To modify characters in one of the character set variations, such as Rotated Print, Select one of the Rotated Print commands, copy to RAM, then use the Define User-Defined Character Set command (1B 26).  
 If font Selected is User-Defined, the command is ignored.

**ESC = n - [MP]**  
**1B 3D n**  
**Select Peripheral Device (for Multi Drop)**

**Synopsis:** Select peripheral device.

<b>ASCII</b>	ESC	=	n
<b>Hexadecimal</b>	<b>1B</b>	<b>3D</b>	<b>n</b>
<b>Decimal</b>	27	61	n

**Value of n**  
 0 (bit 0), device not selected.  
 1 (bit 0), device selected.

**Default :** 1 (bit 0), device selected.

**Description:** Selects the device to which the host computer sends data.  
 When the printer is disabled by this command, it ignores transmitted data until the printer is re-enabled by the same command.

**Note:** Other bits of *n* (1-7) are undefined and ignored.

**ESC @ - [MP] [\*]**

**1B 40**

**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).

Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set and User-defined characters or logo graphics are cleared.

**Default:** Single Wide, Single-High and Left-Aligned characters.

Number of Columns Width	24 <sup>(1)</sup>
Character Pitch (Elite)	12.7 CPI <sup>(1)</sup>
Extra Dot Rows	0
Character Set (16*24)	Default <sup>(1)</sup>
Code Page (437)	Default <sup>(2)</sup>
Printing Position	Column One.

<sup>(1)</sup>Mode resident user m=0 see code Set or Read default font 1F03 0Fm or 1F 07 0F.

<sup>(2)</sup>Mode See code Set or Read 1F03 80m or 1F 07 80.

**ESC “BMP file” - [MP]**

**1B 42 4D ...**

**Download BMP Logo**

**Synopsis:** Download BMP file.

<b>ASCII</b>	ESC	B	M	...	ESC	“BMP File”
--------------	-----	---	---	-----	-----	------------

<b>Hexadecimal</b>	1B	42	4D	...	1B	“BMP File”
--------------------	----	----	----	-----	----	------------

<b>Decimal</b>	27	66	77	...	27	“BMP File”
----------------	----	----	----	-----	----	------------

**Value** Maximum width = 384 for 58mm paper.

**Description:** Enters a downloaded BMP logo into RAM or Flash.

The downloaded BMP logo can be printed by using the Print Downloaded Image (1D 2F n) command.

To download a BMP file to save it as a logo, send the ESC (1Bh) character followed by the whole BMP file.

The printer decodes the BMP file header and will save the image data after checking important parameters, such as :

- Width.
- Height.
- Number of colours (only monochrome images are accepted).

**Note:** BMP file images that are not monochrome are ignored.

Microsoft BMP bitmap file format.

See command “Return Logo Checksum” (1F 65 n)

See also chapter “Memory allocation” for information about potential limitations.

**ESC D [n]...k NUL - [MP]**

**1B 44 [n]...k NUL**

**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

**ESC E n - [MP]**

**1B 45 n**

**Select or cancel Emphasized Mode**

**Synopsis:** Turn emphasized mode on/off.

**ASCII** ESC E n

**Hexadecimal** 1B 45 n

**Decimal** 27 69 n

**Value of n** 0 = Off  
1 = On (When 0 and 1 are the Least Significant Bit, LSB)

**Default:** 0 (Off)

**Description:** Starts or stops emphasized printing. The printer is reset to the standard print mode after a Clear Printer (10) command is received.

**Note:** Only the lowest bit of n is effective.  
Emphasized printing cannot be used with bit-images or downloaded bit-images.

This command and the Select Print Mode(s) command (1B 21) function identically. They should have the same setting when used together.

**ESC G n - [MP]**  
**1B 47 n**  
**Select or Cancel Double Strike**

**Synopsis:** Turn double strike mode On/Off.

<b>ASCII</b>	ESC	G	n
<b>Hexadecimal</b>	<b>1B</b>	<b>47</b>	<b>n</b>
<b>Decimal</b>	27	71	n

**Value of n** 0 = Off  
 1 = On (When 0 and 1 are the Least Significant Bit, LSB)

**Default:** 0 (Off)

**Description:** Turns double strike mode on or off. Identical to Emphasized mode. The printer is reset to the standard print mode after a Clear Printer (10) command is received.

**Note:** Only the lowest bit of *n* is effective.  
 Double-strike printing cannot be used with bit-images or downloaded bit-images.

**ESC I n - [MP]**  
**1B 49 n**  
**Select or Cancel Italic Print**

**Synopsis:** Turn Italic mode On/Off.

<b>ASCII</b>	ESC	I	n
<b>Hexadecimal</b>	<b>1B</b>	<b>49</b>	<b>n</b>
<b>Decimal</b>	27	73	n

**Value of n** 0 = Off  
 1 = On (When 0 and 1 are the Least Significant Bit, LSB)

**Default:** 0 (Off)

**Description:** Turns Italic print mode on or off. The printer is reset to the standard print mode after a Clear Printer (10) command is received.

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

**ESC J n - [MP] [\*]**

**1B 4A n**

**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.

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion units, the parameters of this command (Print and Feed Paper) will be interpreted accordingly.

**ESC K n1 n2 d1 ... dn - [MP]**

**1B 4B n1 n2 d1 ... dn**

**Select Single Density Graphics**

**Synopsis:** Select single density graphics.

**ASCII** ESC K n1 n2 d1 ... dn

**Hexadecimal** 1B 4B n1 n2 d1 ... dn

**Decimal** 27 75 n1 n2 d1 ... dn

<b>Value of n</b>	<b>(8-Dot Single Density Mode)</b>	<b>(24-Dot Single Density Mode)</b>
	$n1 + (256 \times n2)$	$3 \times [n1 + (256 \times n2)]$

**Value of d** Number of Bytes of Data (Printed Down, Then Across)

**Description:** Enters one line of 8-dot single-density graphics into the print buffer. Any print command is required to print the line, after which the printer returns to normal processing mode. Single-density mode allows 0-192 dot columns for 58 mm paper.

Each bit corresponds to two horizontal dots. Compare to Set Bit Image Mode (1B 2A, m=0) earlier in this document.

**ESC L - [MP]**

**1B 4C**

**Select Page Mode**

**Synopsis:** Select page mode.

**ASCII** ESC L

**Hexadecimal** 1B 4C

**Decimal** 27 76

**Description:** Switches from standard mode to page mode. After printing has been completed either by the Print and Return to Standard Mode (FF) command or Select Standard Mode (ESCS) the printer returns to standard mode. The developed data is deleted after being printed.

This command sets the position where data is buffered to the position specified by Select Print Direction in Page Mode (ESC T) within the printing area defined by Set Print Area in Page Mode (ESC W).

This command switches the settings for the following commands (which values can be set independently in standard mode and page mode) to those for page mode.

- Set Right-Side Character Spacing (ESC SP)
- Select 1/6-Inch Line Spacing (ESC 2)
- Set Line Spacing (ESC 3)

It is possible only to set values for the following commands in page mode. These commands are not executed.

- Select or Cancel 90 Degree Clockwise Rotation (ESC V)
- Set Counter Clockwise Rotation (ESC DC2)
- Select Justification (ESC a)
- Select or Cancel Upside-Down Printing (1B7B).
- Set Left Margin (SUB GS L)
- Set Print Area Width (SUB GS W)

**Note:** The command is enabled only when input at the beginning of a line  
The command has no effect if page mode has previously been selected.  
Default first Windows 50mm ( x= 348 dots ; y = 400dots lines).

**ESC R n - [MP]**

**1B 52 n**

**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 :**

n		Code Page
Decimal	Hex	
0	00	437 : US
1	01	850 : Multilingual
2	02	852 : Latin 2, Slavic
3	03	860 : Portuguese
4	04	863 : Canadian French
5	05	865 : Nordic
6	06	858 : Multilingual Latin 1 + Euro
7	07	866 : Cyrillic, Russian
8	08	1252 : Windows, Latin 1
9	09	862 : Hebrew
10	0A	Katakana
11	0B	1253 : Windows, Greek
21	0C	737 : Greek
48	30	Easy Font Single Byte 0.
49	31	Easy Font Single Byte 1.
50	32	Easy Font Single Byte 2.
51	33	Easy Font Single Byte 3.

**Default:** 0 (Code Page 437).

**Description:** Selects the character set to be used.

**Note:** Set default Code Page 437, selectable through configuration menu with code 1F 03 80 n (= 0).  
Same command (1B 74 n).

**ESC S - [MP]**

**1B 53**

**Select Standard Mode**

**Synopsis:** Select standard Mode (Cancel page mode).

<b>ASCII</b>	ESC	S
<b>Hexadecimal</b>	<b>1B</b>	<b>53</b>
<b>Decimal</b>	27	83

**Description:** Switches from page mode to standard mode. In switching from page mode to standard mode, data buffered in page mode are cleared, the printing area set by Set Print Area in Page Mode (SUB ESC W) is initialized and the print position is set to the beginning of the line.

This command switches the settings for the following commands (the values for these commands can be set independently in standard mode and page mode) to those for standard mode:

Set Right-Side Character Spacing (ESC SP)

Select 1/6 Inch Line Spacing (ESC 2)

Set Line Spacing (ESC 3)

Standard mode is automatically selected when power is turned on, the printer is reset, or the Initialize Printer command (ESC @) is used.

**Note:** This command is effective only in page mode.

**ESC T n - [MP]**

**1B 54 n**

**Select Print Direction in Page Mode**

**Synopsis:** Select print direction in page mode.

<b>ASCII</b>	ESC	T	n
<b>Hexadecimal</b>	<b>1B</b>	<b>54</b>	<b>n</b>
<b>Decimal</b>	27	84	n

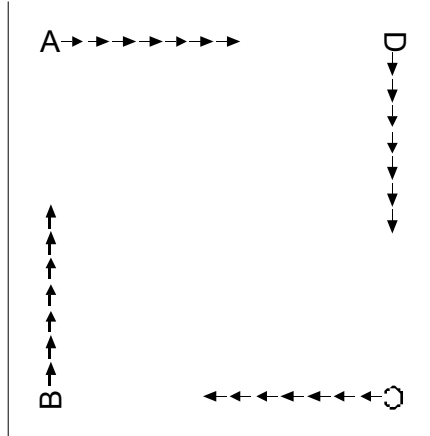
**Value of** n Start position

- 0 = Upper left corner proceeding across page to the right (A).
- 1 = Lower left corner proceeding up the page (B).
- 2 = Lower right corner proceeding across page to the left (upside down) (C).
- 3 = Upper right corner proceeding down page (D).

**Default:** 0

**Description:** Selects the printing direction and start position in page mode. See the illustration below. The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed using the Print Page Mode commands (FF or ESC FF).

**Note:** The command is valid only in page mode. The command is ignored if the value of *n* is out of the specified range.



**ESC V n - [MP]**

**1B 56 n**

**Select or Cancel 90 Degree Clockwise Rotated Print**

**Synopsis:** Turn 90 degree clockwise mode on/off.

**ASCII** ESC V n

**Hexadecimal** 1B 56 n

**Decimal** 27 86 n

**Value of n** 0 = Cancel.

1 = Set

**Default:** 0 (Cancel)

**Description:** Rotates characters 90 degrees clockwise. The command remains in effect until the printer is reset or until a Clear Printer (10) or Rotated Print (1B12) command is received.

**ESC W xL xH dxL dxH dyL dyH - [MP]**

**1B 57 xL xH dxL dxH dyL dyH**

**Set Printing Area in Page Mode**

**Synopsis:** Set printing area in page mode.

<b>ASCII</b>	ESC	W	xL	xH	yL	yH	dxL	dxH	dyL	dyH
<b>Hexadecimal</b>	<b>1B</b>	<b>57</b>	xL	xH	yL	yH	dxL	dxH	dyL	dyH
<b>Decimal</b>	27	87	xL	xH	yL	yH	dxL	dxH	dyL	dyH

**Range of \_x\_ , \_y\_** 0-255

**Default (Dec.)** xL = xH = yL = yH = 0  
dxL = 128; dxH = 1 → Dx size = 384.  
dyL = 128; dyH = 1 → Dy size = 384.

**Description:** Sets the position and size of the printing area in page mode.

The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed using the Print Page Mode commands (ESC FF).

**Formulas:** The starting position of the print area is the upper left of the area to be printed (x0, y0). The length of the area to be printed in the y direction is set to dy inches. The length of the area to be printed in the x direction is set to dx inches. Use the equations to determine the Value of x0, y0, dx, and dy.

See the illustration for a graphic representation of the printing area. For more information about the fundamental calculation pitch, see the Set Horizontal and Vertical Motion Units command (1D50).

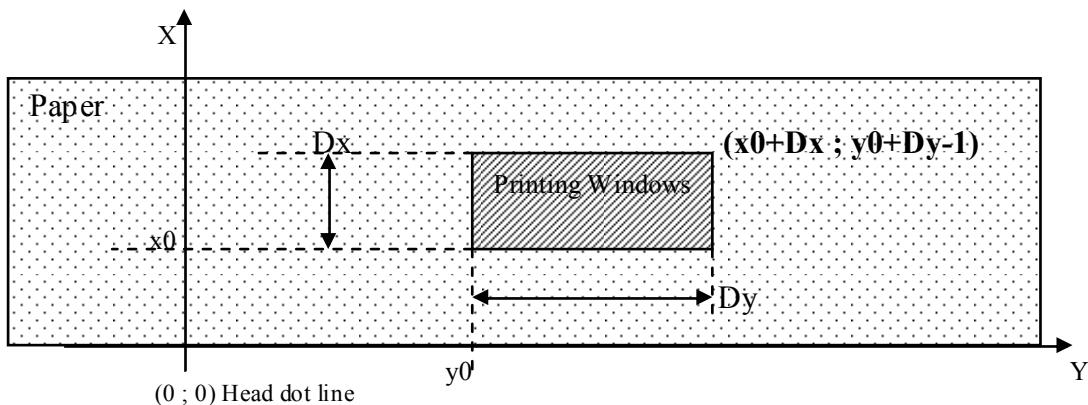
$$x0 = [(xL + xH \times 256) \times (\text{horizontal direction of the fundamental calculation pitch})]$$

$$y0 = [(yL + yH \times 256) \times (\text{vertical direction of the fundamental calculation pitch})]$$

$$Dx = [(dxL + dxH \times 256) \times (\text{horizontal direction of the fundamental calculation pitch})]$$

$$Dy = [(dyL + dyH \times 256) \times (\text{vertical direction of the fundamental calculation pitch})]$$

Keep the following notes in mind for this command. The fundamental calculation pitch depends on the vertical or horizontal direction. The maximum printable area in the x direction is 448/203 inches for 60 mm paper.



**ESC Y n1 n2 d1 ... dn - [MP]**

**1B 59 n1 n2 d1 ... dn**

**Select Double Density Graphics**

**Synopsis:** Select Double density graphics.

**ASCII** ESC Y n1 n2 d1 ... dn

**Hexadecimal** 1B 59 n1 n2 d1 ... dn

**Decimal** 27 89 n1 n2 d1 ... dn

<b>Value of n</b>	<b>(8-Dot Single Density Mode)</b>	<b>(24-Dot Single Density Mode)</b>
	$n1 + (256 \times n2)$	$3 \times [n1 + (256 \times n2)]$

**Value of d** Number of Bytes of Data (Printed Down, Then Across)

**Description:** Enters one line of 8-dot double-density graphics into the print buffer. Any print command is required to print the line, after which the printer returns to normal processing mode. Double-density mode allows 0-384 dot columns for 58mm paper.

The number of bytes sent is represented by the formulas in the table.

Each bit corresponds to one horizontal dot. Compare to Set Bit Image Mode (1B 2A, m=1) earlier in this document.

**ESC [ } - [MP]**

**1B 5B 7D**

**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 of 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.

This command does not affect the current communication parameters. Once the printer is in flash download mode, this command is no longer available.

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

Once the printer is in flash download mode, this command is no longer available.

**ESC \ nL nH - [MP]**

**1B 5C nL nH**

**Set Relative Print Position**

**Synopsis:** Set relative print position.

<b>ASCII</b>	ESC	\	nL	nH
<b>Hexadecimal</b>	<b>1B</b>	<b>5C</b>	<b>nL</b>	<b>nH</b>
<b>Decimal</b>	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:**

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Relative Print Position) will be interpreted accordingly. For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command (1D50) in this document.

**Formulas:**

To move to the left:

The example shows how to set the relative position 20 dots to the left of the current position.

$$65536-20 = 65516 \qquad 65516/256 = 255, \text{ remainder of } 236 \qquad nL = 236, nH = 255$$

To move to the right:

The example shows how to set the relative position 260 dots to the right of the current position.

$$260/256 = 1, \text{ remainder of } 4 \qquad nL = 04, nH = 01$$

**ESC a n - [MP]**

**1B 61 n**

**Select Justification**

<b>Synopsis:</b>	Select justification.		
<b>ASCII</b>	ESC	a	n
<b>Hexadecimal</b>	<b>1B</b>	<b>61</b>	<b>n</b>
<b>Decimal</b>	27	97	n

<b>Operand:</b>	n = mode selection
<b>Value of n</b>	0, 48 = Left aligned 1, 49 = Center aligned 2, 50 = Right aligned
<b>Limits :</b>	0-2, 48-50
<b>Default</b>	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.

<b>Example:</b>	ABC	ABC	ABC
	ABCD	ABCD	ABCD
	ABCDE	ABCDE	ABCDE
	<i>n = 00</i>	<i>n = 01</i>	<i>n = 02</i>

**ESC c 5 n - [MP]**

**1B 63 35 n**

**Enable or Disable Panel Switch**

<b>Synopsis:</b>	Enable or Disable Panel switch.		
<b>ASCII</b>	ESC	c	5 n
<b>Hexadecimal</b>	<b>1B</b>	<b>63</b>	<b>35 n</b>
<b>Decimal</b>	27	99	53 n

<b>Value of n</b>	0 = Enable 1 = Disable
<b>Default</b>	0 (Enable)

**Description:** Enables or disables the paper feed button by toggling the paper feed button on and off. Only the lowest bit is used to toggle the paper feed button. If the last bit is 0, the paper feed button is enabled. If the last bit is 1, the paper feed button is disabled.

**Exceptions:** Functions that require the panel button cannot be used when it has been disabled with this command.

<b>ESC d n - [MP]]</b>
<b>1B 64 n</b>
<b>Print and Feed <i>n</i> Lines</b>

**Synopsis:** Print and feed *n* lines.

**ASCII** ESC d n

**Hexadecimal** 1B 64 n

**Decimal** 27 100 n

**Operand:** n = range

**Limits :** 0-255 (0 is interpreted as 1)

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

**ESC t n - [MP]**  
**1B 74 n**  
**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
1	01	850 : Multilingual
2	02	852 : Latin 2, Slavic
3	03	860 : Portuguese
4	04	863 : Canadian French
5	05	865 : Nordic
6	06	858 : Multilingual Latin 1 + Euro
7	07	866 : Cyrillic, Russian
8	08	1252 : Windows, Latin 1
9	09	862 : Hebrew
10	0A	Katakana
11	0B	1253 : Windows, Greek
21	0C	737 : Greek
48	30	Easy Font Single Byte 0
49	31	Easy Font Single Byte 1
50	32	Easy Font Single Byte 2
51	33	Easy Font Single Byte 3

**Default:**           0           (Code Page 437), selectable through configuration menu

**Description:**     Selects the character set to be used.

**Notes:**           Set default Code Page 437, selectable through configuration menu with code 1F 03 80 n (=0).  
 Same command (1B 52 n).

**ESC v n - [MP] [\*]**

**1B 76**

**Transmit Paper Sensor Status**

**Synopsis:** Transmit paper sensor Status.

**ASCII** ESC v

**Hexadecimal** 1B 76

**Decimal** 27 118

**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. See the following table.

**Status Byte**

Bit	Function	0 Signifies	1 Signifies
0	Reserved	0	-
1	Receipt Cover	Closed	Open
2	Receipt Paper	Present	Out
3	Reserved	0	-
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

**ESC z - [MP]**

**1B 7A**

**Clear Current Position Count**

**Synopsis:** Clear current position count.

**ASCII** ESC z

**Hexadecimal** 1B 7A

**Decimal** 27 122

**Description:** A buffered command that clears the current position count.

**ESC { n - [MP] [\*]**  
**1B 7B n**  
**Select or Cancel Upside-Down Print Mode**

**Synopsis:** Turn on/off upside down printing mode.

<b>ASCII</b>	ESC	{	n
<b>Hexadecimal</b>	<b>1B</b>	<b>7B</b>	<b>n</b>
<b>Decimal</b>	27	123	n

**Value of n** 0 = Cancel

1 = Set

**Default** 0 (Cancel)

**Description:** Prints upside-down characters. The command may be combined with Clock Wise Rotated print (1B 56) or Counter Clock Wise Rotated print (1B 12). The character order is inverted in the buffer so text is readable. Only bit 0 is used. Bits 1-7 are not used. See Summary of Rotated Printing in this document for more information.

**FS F t - [MP]**  
**1C 46 t**  
**Read Font information**

**Synopsis:** Read font information.

<b>ASCII</b>	FS	F	t
<b>Hexadecimal</b>	<b>1C</b>	<b>46</b>	<b>t</b>
<b>Decimal</b>	28	70	t

**Operand:** t = Font storage Identify

<b>Value of t:</b>	48	0x30 (ASCII <i>n</i> = 0)	Single Font n°00
	49	0x31 (ASCII <i>n</i> = 1)	Single Font n°01
	50	0x32 (ASCII <i>n</i> = 2)	Single Font n°02
	51	0x33 (ASCII <i>n</i> = 3)	Single Font n°03

<b>Returns:</b>	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.

**FS H - [MP]**

**1C 48**

**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.

**FS L f8 t w n {d} - [MP]**

**1C 4C f8 t w h {d}**

**Download Single Byte Font**

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

<b>ASCII</b>	FS	L	f8	t	w	h	{d}
<b>Hexadecimal</b>	1C	4C	f8	t	w	h	{d}
<b>Decimal</b>	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

<b>Returns :</b>	<b>OK</b>	<b>Fault</b>
<b>ASCII</b>	ACK	NAK
<b>Hexadecimal</b>	06	15
<b>Decimal</b>	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).

**GS SOH - [BP] [MP]**

**1D 01**

**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 (1D02 nn) command :

1 = 128k bytes Flash

7 = 512k bytes Flash

15 = 1M byte Flash

**GS STX n - [BP]**

**1D 02 n**

**Select Flash Memory Sector to Download**

**Synopsis:** Select flash memory sector to download.

**ASCII** GS STX n

**Hexadecimal** 1D 02 n

**Decimal** 29 2 n

**Value and range** n : 0-7 = 512k bytes Flash

0-15 = 1M bytes Flash

0-31 = 2M bytes Flash

**Description:** Selects the flash sector (n) 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 a NAK if the sector number is not acceptable. Sector numbers start at 0.

**Exceptions:** Available only in download mode.

**GS EOT n - [MP]**

**1D 03 n**

**Real Time Recovery from Fault**

**Synopsis:** Real time recovery from fault.

**ASCII** GS EOT n

**Hexadecimal** 1D 03 n

**Decimal** 29 3 n

**Operand:** n = Recovery mode

**Description:** See information command 1005 n. Same command.

**GS EOT n - [MP] [\*]**

**1D 04 n**

**Real Time Status Transmission**

**Synopsis:** Real time status transmission.

**ASCII** GS EOT n

**Hexadecimal** 1D 04 n

**Decimal** 29 4 n

**Operand:** n = Sequence

**Description:** See informations command (10 04 n). Same command.

**GS ENQ - [MP]**

**1D 05**

**Real Time Status Transmission**

**Synopsis:** Real time status transmission.

**ASCII** GS ENQ

**Hexadecimal** 1D 05

**Decimal** 29 5

**Reply Status** 1 byte (See value of byte table below)

**Description:** Transmits one byte status of the printer in real time.

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Reserved.
1	Off	00	0	Reserved.
2	Off	00	0	Cover Closed.
	On	04	4	Cover Open.
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	Off	00	0	Fixed to Off.
6	Off	00	0	No error condition.
	On	40	64	Error condition exists in the printer.
7	On	80	128	Fixed to On.

**GS ACK - [BP] [MP]**

**1D 06**

**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

**GS BEL - [BP] [MP]**

**1D 07**

**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.

**GS BS -[MP]**

**1D 08**

**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):** (64Kb =) 2

**Description:** Returns the size of SRAM on board, on one byte as number of 32 Kbytes sectors.

**GS HT -[MP]**

**1D 09**

**Return CPU frequency**

**Synopsis:** Return CPU frequency.

**ASCII** GS HT

**Hexadecimal** 1D 09

**Decimal** 29 9

**Return:** 1 byte = Frequency

**Values (Dec):** 72 (MHz )

**Description:** Returns the CPU board frequency in MHz.

**GS LF -[MP] [DBG]**

**1D 0A**

**Return Hardware information**

**Synopsis:** Return hardware monitoring.

**ASCII** GS LF

**Hexadecimal** 1D 0A

**Decimal** 29 10

**Returns:** 1 bytes = Status Byte reply

**Value:**

Bit <sup>(1)</sup>	Function	0 Signifies	1 Signifies
1	Temperature Low	No	Yes
2	Reset CPU low power	No	Yes
3	Reset CPU watchdog	No	Yes
4	Reserved	Fixed to Zero	Fixed to Zero
5	Reset CPU Software	No	Yes
6	Reset CPU hardware	No	Yes
7	Power Failure <sup>(2)</sup>	No	Yes

<sup>(1)</sup> Bits 0 is not used "0"

<sup>(2)</sup> The printer reset bit will be zero after the reset condition has been reported to the host for the first time.

**Description:** Sends status data to the host computer.

**GS VT -[MP]**

**1D 0B**

**Return User Flash Size**

**Synopsis:** Return User flash memory size.

**ASCII** GS VT

**Hexadecimal** 1D 0B

**Decimal** 29 11

**Return:** 1 byte

**Description:** Returns the total amount of Flash memory accessible for user operations. This is the sum of memory allocated to Logos/fonts storage, User data storage, Easy font storage

**Formulas:** The User Flash Size is returned on one 1 byte, and the returned value corresponds the size divided by 65535 (64k).

For example, if the User Flash Size is 512kb, the command would return 8 as  $512/64 = 8$ .

**GS SO -[BP]**

**1D 0E**

**Erase All Flash Contents except Boot Sector**

**Synopsis:** Erase all flash contents except boot sector.

<b>ASCII</b>	GS	SO
<b>Hexadecimal</b>	<b>1D</b>	<b>0E</b>
<b>Decimal</b>	29	14

<b>Return value :</b>	<b>OK</b>	<b>Fault</b>
<b>ASCII</b>	ACK	NAK
<b>Hexadecimal</b>	<b>06</b>	<b>15</b>
<b>Decimal</b>	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.

**GS SI - [BP] [MP]**

**1D 0F**

**Return Main Program Flash CRC**

**Synopsis:** Return main program flash CRC.

<b>ASCII</b>	GS	SI
<b>Hexadecimal</b>	<b>1D</b>	<b>0F</b>
<b>Decimal</b>	29	15

**Returns:** 3 bytes

**Values:** ACK <low byte> <high byte>

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

**GS DLE n - [BP]**
**1D 10 n**
**Erase Selected Flash Sector**

**Synopsis:** Erase selected flash sector.

<b>ASCII</b>	GS	DLE	n
<b>Hexadecimal</b>	<b>1D</b>	<b>10</b>	<b>n</b>
<b>Decimal</b>	29	16	n

**Value and range** n :

0-5	= 384k bytes Flash
0-7	= 512k bytes Flash
0-15	= 1M bytes Flash
0-31	= 2M bytes Flash

**Note:** 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.

**Exceptions:** Available only in download mode.

**GS DC1 al ah cl ch d1...dn -[BP]**
**1D 11 al ah cl ch d1...dn**
**Download to Active Flash Sector**

**Synopsis:** Download to active flash sector.

<b>ASCII</b>	GS	DC1	al	ah	cl	ch	d1...dn
<b>Hexadecimal</b>	<b>1D</b>	<b>11</b>	<b>al</b>	<b>ah</b>	<b>cl</b>	<b>ch</b>	<b>d1...dn</b>
<b>Decimal</b>	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:** Number data byte must be modulo 4kbytes. Available only in download mode.

**GS ! n - [MP]**

**1D 21 n**

**Select Char Size**

**Synopsis:** Select character size.

**ASCII** GS ! n

**Hexadecimal** 1D 21 n

**Decimal** 29 33 n

**Value of n** 1-8 = vertical number of times normal font.

1-8 = horizontal number of times normal font.

**Range of n** 00-07, 10-17, ..., 70-77 (bits 0,1,2;4,5,6)

**Default** 00

**Description:** This command is effective for all characters (except for HRI characters).

In standard mode (non page mode), the vertical direction is the paper feed direction, and the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in 90 degree clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.

Selects height using bits 0 to 2 and selects the character width using bits 4 to 6, as tables follows:

**Exception:** If *n* is out of the defined range, this command is ignored.

Character Width Selection bits 4,5,6		
Hex	Decimal	Width
00	0	1 (normal)
10	16	2 (two times width)
20	32	3 (three times width)
30	48	4 (four times width)
40	64	5 (five times width)
50	80	6 (six times width)
60	96	7 (seven times width)
70	112	8 (eight times width)

Character Height Selection bits 0,1,2		
Hex	Decimal	Height
00	0	1 (normal)
01	1	2 (two times height)
02	2	3 (three times height)
03	3	4 (four times height)
04	4	5 (five times height)
05	5	6 (six times height)
06	6	7 (seven times height)
07	7	8 (eight times height)

**GS “ n - [MP]**

**1D 22 n**

**Select Memory Type (SRAM/FLASH) Where to save Logos or User-defined Fonts**

**Synopsis:** Select Memory type SRAM or Flash.

<b>ASCII</b>	GS	“	n
<b>Hexadecimal</b>	<b>1D</b>	<b>22</b>	<b>n</b>
<b>Decimal</b>	29	34	n

**Value of n** 48-51

- = 48 (ASCII  $n = 0$ ) Loads active logo to RAM only. This is used to print a special logo but not have it take up flash memory. A logo defined following this command is not preserved over a power cycle.
- = 49 (ASCII  $n = 1$ ) Loads active logo to flash memory. This is the default condition for logo flash storage. A logo defined following this command is stored in flash memory.
- = 50 (ASCII  $n = 2$ ) Loads user-defined characters to RAM only. This is the default condition for user-defined character storage. Any user-defined characters defined following this command are not preserved over a power cycle
- = 51 (ASCII  $n = 3$ ) Loads user-defined characters to flash memory. An application must use this command to store user-defined characters in flash memory. Any user-defined characters defined following this command are stored in flash memory. A user-defined character cannot be redefined in flash memory. The flash memory page must be erased by an application before redefining user-defined characters. For more information, see the Erase User Flash Sector (1D 40  $n$ ) Command earlier in this section.

**Description:** Specifies whether to load the logos or user-defined characters to flash memory or to RAM (volatile memory). The selection remains in effect until it is changed via this command or until the power cycles.

**GS "U n - [MP]**

**1D 22 55 n1 n2**

**Flash Memory User Sector Allocation**

**Synopsis:**

<b>ASCII</b>	GS	"	U	n1	n2
<b>Hexadecimal</b>	<b>1D</b>	<b>22</b>	<b>55</b>	<b>n1</b>	<b>n2</b>
<b>Decimal</b>	29	34	85	n1	n2

**Default value of n1 :** 1 (n1 See Below)

**Default value of n2 :** 1 (n2 See Below)

$n1 + n2 \leq 2$  (= Size Max Storage for 384K flash memory)

$n1 + n2 \leq 4$  (= Size Max Storage for 512K flash memory)

$n1 + n2 \leq 12$  (= Size Max Storage for 1M flash memory)

**Formulas:** Size Max. Storage =  $n1 + n2 + n3$  ( $n3$ , see definition bellow)

$n3 = \text{Size Max. Storage} - n1 - n2$

<b>Return :</b>	<b>OK</b>	<b>Fault</b>
<b>ASCII</b>	ACK	NAK
<b>Hexadecimal</b>	<b>06</b>	<b>15</b>
<b>Decimal</b>	6	21

**Description:** n1 is the number of 64K sectors used for logos and user defined characters.

n2 is the number of 64K sectors used for user data storage.

n3 is the number of 64K sector used for Easy font storage.

**Note:** If  $(n1 + n2) = 0$ , all sector are used for Easy font sector.

If  $(n1 + n2)$  is greater than the maximum number of sectors available, the command is ignored.

Issuing this command with parameters different from current parameters will erase all sectors.

GS # n -[MP]

1D 23 n

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 – 255

**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 or RAM memory as logo *n*. If the logo is saved to flash ( see command 1D 22 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.

In the case of a previously existing application that expects only one possible logo, the printer will not receive the Select Current Logo (1D 23 *n*) command. In this case, the printer assigns 0 as the active logo identifier. It automatically stores any new logo definition in memory as logo 0, inactivating any previous logo 0 definitions. If the flash memory space available for logos fills up with inactive logo 0 definitions, the firmware erases the old definitions at the next power cycle. This is the only case in which the printer erases flash memory without an application command.

**Note:** In the case of a new application using multiple logos, the Select Current Logo (1D 23 *n*) command is used. After that, the printer no longer automatically erases the logo definition flash memory page when it fills with multiple definitions. A new application using multiple logos, writing a user-defined character set into flash memory, or both, is responsible for erasing the logo and user-defined character set flash memory page when the logo area is full or before a new character set is defined.

**GS \$ nL nH -[MP]**

**1D 24 nL nH**

**Set Absolute Vertical Print Position in Page Mode**

**Synopsis:** Set absolute vertical print in page mode.

**ASCII** GS \$ nL nH

**Hexadecimal** 1D 24 nL nH

**Decimal** 29 36 nL nH

**Formulas**  $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$  inches.

**Description:** Sets the absolute vertical print starting position for buffer character data in page mode. The absolute print position is set to  $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$  inches. The vertical or horizontal motion unit for the paper roll is used and the horizontal starting buffer position does not move. The references starting position is set by Select Print Direction in Page Mode (ESC T) and operates setting the absolute position in the vertical direction when the starting position is set to the upper left or lower right; and sets the absolute position in the horizontal when the starting position is set to the upper rights or lower left. The horizontal and vertical motion units are specified by the Set Horizontal and Vertical Minimum Motion Units (GSP) command. The Set Horizontal and Vertical Minimum Motion Units (GS P) command can be used to change the horizontal and vertical motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

**Note:** This command is effective only in page mode. If the  $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$  exceeds the specified printing area, this command is ignored.

**GS % s dL dH – [MP]**

**1D 25 s dL dH**

**Select or Cancel Multi-Heat Current Mode**

**Synopsis:** Change Multi-Heat Current Mode.

**ASCII** GS % n dL dH

**Hexadecimal** 1D 25 n dL dH

**Decimal** 29 37 n dL dH

**Operand:**

- n** = Select Multi-Heat Mode
- 0 0x00 = Reset Multi-Heat Mode
- 1 0x01 = Set Multi-Heat Mode

**dH** = Msb number dots (1 byte).

**dL** = Lsb number dots (1 byte).

**Number dots** = (dL + (dH \* 256) )

**Description:** This command allows the user to set or reset the multi-heat current process and to configure the peak current with the number of dots on in same time.

If line buffer isn't empty, prints one line from the buffer and change multi-Heat mode or parameters.

**Formulas:** Current Head (A) = ((Vch/Rhdot)\*Number dots)

- Vch = Head Power Supply [4.5V;8.0V]

- Rdot nominal = 176Ohm nominal.

- Number Dots = [32; 384].

- Other Power Board = ~4W (with current paper feed motor) **TBC!**

**Example:** Rdot = 176Ohm ; Vch = 5.5V ; Number dots = 50 → Peak current Head = 1.56A

**Note :** After reset, the Multi-Heat Mode is 0 or 1. This value depend of the the command (1F 03 A5 s dL dH).

**GS \* n1 n2 d1...dn - [MP]**

**1D 2A n1 n2 d1 ... dn**

**Define Downloaded Bit Image**

**Synopsis:** Define downloaded bit image in memory.

<b>ASCII</b>	GS	*	n1	n2	d1...dn
<b>Hexadecimal</b>	<b>1D</b>	<b>2A</b>	<b>n1</b>	<b>n2</b>	<b>d1...dn</b>
<b>Decimal</b>	29	42	n1	n2	d1...dn

<b>Operands:</b>	<b>Value of n1</b>	<b>Value of n2</b>	<b>Value of d</b>
	1-56 (8 x n1 = Number of Horizontal Dot Columns)	1-64 (Number of Vertical Bytes) <sup>1</sup>	Bytes of Data (Printed Down, Then Across)

<sup>1</sup>The number of bytes sent is represented by the following formula:

$$n = 8 \times n1 \times n2 \text{ (} n1 \times n2 \text{ must be less than or equal to 3584).}$$

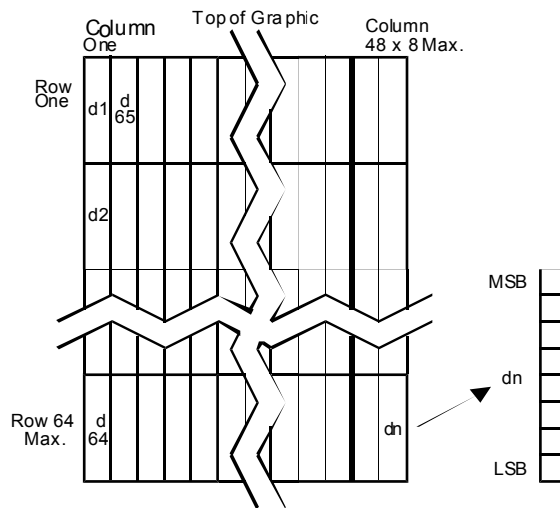
See the illustration below for a graphic representation of the downloaded bit image :

<b>Return :</b>	<b>OK</b>	<b>Fault</b>
<b>ASCII</b>	ACK	NAK
<b>Hexadecimal</b>	<b>06</b>	<b>15</b>
<b>Decimal</b>	6	21

**Description:** Enters a downloaded bit image (such as a logo) into RAM or Flash with the number of dots specified by n1 and n2. The downloaded bit image is available until power is turned off, another bit image is defined, or either Initialize Printer (1B 40), command is received.

**Note:** See the illustration below for a graphic representation of the downloaded bit image. See also chapter "Memory allocation" for information about potential limitations.

### 58 mm paper



**GS / m - [MP]**

**1D 2F m**

**Print Downloaded Bit Image**

**Synopsis:** Print downloaded bit image (Logo).

**ASCII** GS / m

**Hexadecimal** 1D 2F m

**Decimal** 29 47 m

**Operand:** m = mode selection:

Value of <i>m</i>	Print Mode	Vertical DPI <sup>1</sup>	Horizontal DPI*
0	Normal	203	203
1	Double Wide	203	101
2	Double High	101	203
3	Quadruple	101	101

<sup>1</sup>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).

**GS : - [MP]**

**1D 3A**

**Select or Cancel Macro Definition**

**Synopsis:** Start / End macro definition.

**ASCII** GS :

**Hexadecimal** 1D 3A

**Decimal** 29 58

**Description:** Starts or ends macro definition. Macro definition begins when this command is received during normal operation and ends when this command is received during macro definition. The macro definition is cleared, during definition of the macro when the Execute Macro (GS ^) command is received. Normal printing occurs while the macro is defined. When the power is turned on the macro is not defined. The defined contents of the macro are not cleared by the Initialize Printer (ESC@), thus, the Initialize Printer (ESC@) command may be used as part of the macro definition. If the printer receives a second Select or Cancel Macro Definition (GS :) command immediately after previously receiving a Select or Cancel Macro Definition (GS :) the printer remains in the macro undefined state.

**Formulas:** The contents of the macro can be defined up to 2048 bytes.

**Exception:** If the macro definition exceeds 2048 bytes, excess data is not stored.

**GS @ n - [MP]**

**1D 40 n**

**Erase Sections of User Flash Sector**

**Synopsis:** Erase sections of 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 ; Hexadecimal n = 31)

This command erases all 64K Flash memory sectors allocated to user-defined characters and logos storage. Those sectors should be erased in two situations: when the logo definition areas is full and an application is attempting to define new logos, and when an application wants to replace one user-defined character set with another. In both cases, all logos and character set definitions are erased and must be redefined.

50 n = 50 (ASCII n = 2 ; Hexadecimal n = 32)

This command erases all 64K Flash memory sectors allocated to user data storage.

51 n = 51 (ASCII n = 3 ; Hexadecimal n = 33)

This command erases all 64K Flash memory sectors allocated to Easy Font storage.

**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.

**Note:** See command "Flash Memory User Sectors Allocation (1D 22 55 n1 n2)".

**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 (1D40 n) command before sending data.

**GS B n - [MP] [\*]**

**1D 42 n**

**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.

**GS H n - [MP]**

**1D 48 n**

**Select Printing Position of HRI Characters**

**Synopsis:** Select printing position for HRI characters. Barcode Text Mode

**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.

**GS I n - [MP] [\*]**

**1D 49 n**

**Transmit Printer ID**

**Synopsis:** Transmit printer Identify

<b>ASCII</b>	GS	I	<i>n</i>
<b>Hexadecimal</b>	<b>1D</b>	<b>49</b>	<b>n</b>
<b>Decimal</b>	29	73	<i>n</i>

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

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

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

**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						
<i>n</i>		Printer ID	Function		Value	
Decimal	Hex				Decimal	Hex
1, 49	01, 31	Model	ASTERON USB		66	42
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	_ASTERON			
68	44	Serial number	Depends on actual S/N			

**GS I @ n - [MP] [\*]**

**1D 49 40 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 NVM is ignored.

Value of <i>n</i>		Remote diagnostic item	Function
Hex	Dec		
20	32	Serial #, 10 digits ASCII	(*) Write to NVRAM Example, send 14 bytes to printer: GS I @ 0x20 1234567890
21	33	Serial #	Write to NVRAM, and print on receipt to verify Example, send 14 bytes to printer: GS I @ ! 1234567890 This will print on receipt: Serial # written: 1234567890
23	35	Serial #	Return Serial #, preceded by <i>n</i> to identify Printer returns 12 bytes in above example: #1234567890<CR> <small>(*) 0x20 ≤ digit ≤ 0x79</small>
24	36	Class/model #, 15 digits ASCII	(*) Write to NVRAM
25	37	Class/model #	Write to NVRAM, and print on receipt to verify
27	39	Class/model #	Return Class/model #, returns 17 bytes
2B	43	Boot firmware part Number	Return boot firmware part number, return 14 bytes
2F	47	Boot firmware CRC, 4 digits ASCII	Return Boot firmware CRC, returns 6 bytes
33	51	Client firmware part number	Return client firmware part number, returns 14 bytes
37	55	Client firmware CRC, 4 digits ASCII	Return Client firmware CRC, returns 6 bytes

Value of <i>n</i>		Remote diagnostic item	Function
Hex	Dec		
80	128	Receipt lines tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM Example, send 12 bytes to printer: GS I @ Ç00010000 To set receipt lines tally to 10,000
81	129	Receipt lines tally	Write to NVRAM, and print on receipt to verify Example, send 12 bytes to printer: GS I @ ü00010000 This will print on receipt: Receipt tally written: 10,000
82	130	Receipt lines tally	Clear receipt lines tally to 0
83	131	Receipt lines tally	Return receipt lines tally, preceded by <i>n</i> to identify Printer returns 10 bytes in above example: â00010000<CR>
90	144	Hours on tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM
91	145	Hours on tally	Write to NVRAM, and print on receipt to verify
92	146	Hours on tally	Clear Hours on tally to 0
93	147	Hours on tally	Return Hours on tally, returns 10 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
A4	164	Flash cycles tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM
A5	165	Flash cycles tally	Write to NVRAM, and print on receipt to verify
A6	166	Flash cycles tally	Clear Flash cycles tally to 0
A7	167	Flash cycles tally	Return Flash cycles tally, returns 10 bytes
AC	172	Cover Open 8 digits ASCII numeric, max 99,999,999	Write to NVRAM Example, send 12 bytes to printer: GS I @ ¼00010000 To set Cover Open tally to 10,000
AD	173	Cover Open	Write to NVRAM, and print on receipt to verify Example, send 12 bytes to printer: GS I @ ¡0010000 This will print on receipt: Cover Open: 10,000
AE	174	Cover Open	Clear Cover Open tally to 0.
AF	175	Cover Open	Return Cover Open tally, preceded by <i>n</i> to identify Printer returns 10 bytes in above example: »0010000<CR>
B2	178	MAX Temperature tally	Set MAX temp tally to -273.
B3	179	MAX Temperature tally	Return Temperature tally

Value of <i>n</i>		Remote diagnostic item	Function
Hex	Dec		
B4	180	Reboot device tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM.
B5	181	Reboot device tally	Write to NVRAM, and print on receipt to verify.
B6	182	Reboot device tally	Clear Flash cycles cut tally to 0.
B7	183	Reboot device tally	Return reboot device tally, return 10 bytes.
D8	216	Meter Print tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM.
D9	217	Meter Print tally	Write to NVRAM, and print on receipt to verify.
DA	218	Meter Print tally	Clear Flash Meter Print tally to 0.
DB	219	Meter Print tally	Return Meter Print tally, return 10 bytes.

**GS L nL nH - [MP]**

**1D 4C nL nH**

**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:** Printable area size.

**Range of nL** 0-255

**Range of nH** 0-255

**Default** 0 (384 dots the maximum printable area).

**Description:** Sets the left margin of the printing area. The left margin is set to  $((nH * 256) + nL)$  times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D50). This command is described below.

The width of the printing area is set by the Set Printing Area Width command (1D 57), which follows this command. See the Set Printing Area Width command (1D 57) in this document for a description of that command.

If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 384 dots. See the illustration.

**Note:** If the setting exceeds the printable area, the maximum value of the printable area is used (n=0).

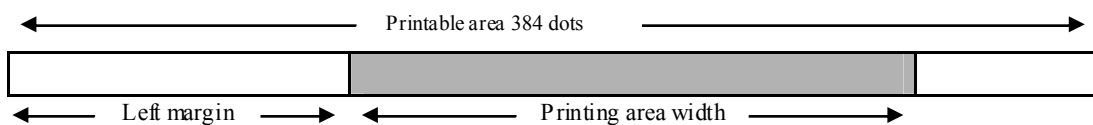
The maximum printable area is 384 dots. See the illustration.

The command is ignored if it is not at the beginning of the line.

**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.



**GS Px y - [MP]**

**1D 50 x y**

**Set Horizontal and Vertical Minimum Motion Units**

<b>Synopsis:</b>	Set Motion Units.			
<b>ASCII</b>	GS	P	<i>nL</i>	<i>nH</i>
<b>Hexadecimal</b>	<b>1D</b>	<b>4C</b>	<b>nL</b>	<b>nH</b>
<b>Decimal</b>	29	76	<i>nL</i>	<i>nH</i>

**Value of x:** Horizontal.

**Value of y:** Vertical.

**Range of x:** 0-255

**Range of y:** 0-255

**Default of x:** 203

**Default of y:** 203

**Description:** Sets the horizontal and vertical motion units to 1/x inch and 1/y inch respectively.  
When x or y is set to 0, the default setting for that motion unit is used.

**GS W nL nH - [MP]**

**1D 57 nL nH**

**Set Printing Area Width**

<b>Synopsis:</b>	Set printing area width.			
<b>ASCII</b>	GS	W	nL	nH
<b>Hexadecimal</b>	1D	57	nL	nH
<b>Decimal</b>	29	87	nL	nH

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

**Range of nL** 0-255

**Range of nH** 0-255

**Default :** 384 dots (the maximum printable area) for 58 mm paper.

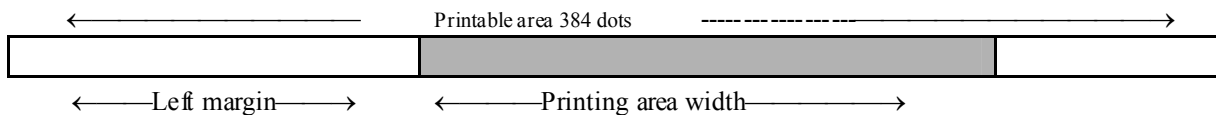
**Description:** Sets the width of the printing area. If the setting exceeds the printable area, the maximum value of the printable area is used. The width of the printing area is set to  $((nH \times 256) + nL)$  times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D50), which is described earlier in this document.

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.

**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.



**GS \ nL nH - [MP]**

**1D 5C nL nH**

**Set Relative Vertical Print Position in Page Mode**

**Synopsis:** Set relative vertical print position in page mode.

**ASCII** GS \ nL nH

**Hexadecimal** 1D 5C nL nH

**Decimal** 29 92 nL nH

**Value:** The value for the horizontal and vertical movement cannot be less than the minimum horizontal movement amount, and, must be in even units of the minimum horizontal movement amount.

**Formulas:** The distance from the current position is set to  $[(nL + nH \times 256) \times \text{vertical or horizontal motion unit}]$  inches.

For downward movement, pitch  $n$  is specified as :

$$n = nL + nH \times 256$$

For upward movement,  $(nL + nH \times 256)$  is negative and pitch  $n$  is specified as :

$$n = 65536 - (nL + nH \times 256)$$

**Description:** Sets the relative vertical print starting position from the current position. This command can also change the horizontal and vertical motion unit. The unit of horizontal and vertical motion is specified by this command.

This command functions as follows, depending on the print starting position set by Select Print Direction in Page Mode (ESC T):

When the starting position is set to the upper left or lower right of the printing area, the vertical motion unit ( $y$ ) is used.

When the starting position is set to the upper right or lower left of the printing area, the horizontal motion unit ( $x$ ) is used.

**Note :** This command is used only in page mode, otherwise it is ignored.  
Any setting that exceeds the specified printing area is ignored.

**GS ^ r t m - [MP]**

**1D 5E r t m**

**Execute Macro**

**Synopsis:** Execute macro.

**ASCII** GS ^ r t m

**Hexadecimal** 1D 5E r t m

**Decimal** 29 94 r t m

**Value of r** The number of times to execute the macro.

**Value of t** The waiting time for executing the macro.

**Description:** Executes a macro. After waiting for a specified period the printer waits for the Paper Feed Button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats this operation the number of specified times. When the macro is executed by pressing the Paper Feed Button ( $m = 1$ ), paper cannot be feed by using the Paper Feed Button.

**Formulas:** The waiting time is  $t \times 100$  ms for every macro execution.

$m$  specifies macro executing mode when the LSB (Least significant bit)  $m = 0$

The macro executes  $r$  times continuously at the interval specified by  $t$  when the LSB (Least significant bit) of  $m = 1$ .

**Note :** If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.

If the macro is not defined or if  $r$  is 0, nothing is executed.

**GS a n - [MP]**

**1D 61 n**

**Select or Cancel Unsolicited Status Mode (USM)**

**Synopsis:** Select or cancel unsolicited status mode.

**ASCII** GS a n

**Hexadecimal** 1D 61 n

**Decimal** 29 97 n

**Value of n :** 0 turns mode off  
Any non-zero value turns mode on.

Communication Interface USB : Select End point Reply	
Interrupt	Bulk
n= [1;127] or [129;255]	n= 128

**Default:** n = 0 (USM disabled)

**Reply:**

- Byte 1 = Printer information
- Byte 2 = Error information
- Byte 3 = Paper information
- Byte 4 = Paper information
- Byte 5 = Count information (\*)

**Description:** Selects whether the printer is to automatically return a 4 or 5 bytes status string whenever the status changes.

**Notes:** This command uses the same sequence as older ASB (Auto Status Back) but has the following differences :

- The parameter n is an on/off switch. It does not select trigger subset
- Any change in any of the following conditions will trigger the USM response
- Receipt Cover.
  - Knife Error (if exist).
  - Out of range Print head Temperature (Recoverable).
  - Out of range motor Temperature (Recoverable).
  - Out of range Voltage (Recoverable).
  - Dynamic memory allocation Error.
  - Papers exhaust Status.
  - Flow Control.
  - Paper Feed Button Status (option).

(\*) If count trigger USM (1F 03 9D m) is different of 0, all five bytes of status are always transmitted else only 4 bytes of status are transmitted.

Recoverable errors include cover open, paper out, temperature or voltage is out of range .

This command is processed as normal printer data.

For this command, parameter n use Backup memory, so parameter n is inchanged after a reset hardware or software. But after a power-down, parameter n is lost (n = default value USM disabled).

"GS a" RETURNED STATUS DEFINITION BYTE 1: PRINTER STATUS			
Bit <sup>(1)</sup>	Function	Value	
		0	1
0	Flash Memory Error	Ok	Failure
1	Sram Memory Error	Ok	Failure
2	Reserved	-	Set to 1
3	Printer Busy	Not Busy	Busy
4	fixed	-	Always 1
5	Cover Position	Closed	Open
6	Feed Switch	No Media Feed	Media Feeding
7	fixed	Always 0	-

"GS a" RETURNED STATUS DEFINITION BYTE 2: ERROR STATUS			
Bit <sup>(1)</sup>	Function	Value	
		0	1
0	Temperature Error Status	Ok	Failure
1	Voltage Error Status	Ok	Failure
2	Reserved	-	-
3	Reserved	-	-
4	Fixed	Always 0	-
5	Reserved	-	-
6	Global Error Status	Ok	Failure
7	fixed	Always 0	-

"GS a" RETURNED STATUS DEFINITION BYTE 3: MEDIA SENSOR STATUS			
Bit <sup>(1)</sup>	Function	Value	
		0	1
0	Media Low	Present	Low
1	Media Low	Present	Low
2	Media Out	Present	Out
3	Media Out	Present	Out
4	fixed	Always 0	-
5	undefined	-	-
6	undefined	-	-
7	fixed	Always 0	-

"GS a" RETURNED STATUS DEFINITION BYTE 4: COMMUNICATIONS or NO TRIGGER FAILURE STATUS			
Bit <sup>(1)</sup>	Function	Value	
		0	1
0	Power Fail	No	Yes
1	undefined	-	-
2	undefined	-	-
3	undefined	-	-
4	fixed	Always 0	-
5	undefined	-	-
6	undefined	-	-
7	fixed	Always 0	-

"GS a" RETURNED COUNT BYTE 5			
Bit <sup>(1)</sup>	Function	Value	
		0	1
0	Bit 0 of count (LSB)	0	1
1	Bit 1 of count	0	2
2	Bit 2 of count	0	4
3	Bit 3 of count	0	8
4	fixed	Always 0	-
5	Bit 4 of count	0	16
6	Bit 5 of count (MSB)	0	32
7	fixed	Always 0	-

<sup>(1)</sup> Unused, reserved or undefined bit(s) set to 0

**GS f n - [MP]**  
**1D 66 n**  
**Select Pitch of HRI Character**

**Synopsis:** Select pitch of HRI character.

<b>ASCII</b>	GS	f	n
<b>Hexadecimal</b>	<b>1D</b>	<b>66</b>	<b>n</b>
<b>Decimal</b>	29	102	n

**Value of n** 0 = Standard Pitch at 12.7 CPI (Elite).  
1 = Compressed Pitch at 16.9 CPI (Pica)

**Default :** 1 (pica)

**Description:** Select font used to print HRI characters.

**GS h n - [MP] [\*]**  
**1D 68 n**  
**Select Bar Code Height**

**Synopsis:** Select bar code height.

<b>ASCII</b>	GS	h	n
<b>Hexadecimal</b>	<b>1D</b>	<b>68</b>	<b>n</b>
<b>Decimal</b>	29	104	n

**Operand:** n = Number of dots

**Limits:** 1 ≤ n ≤ 255

**Default** = 216 dots

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

<b>GS k m d1...dk NUL - [MP] [*]</b>
<b>1D 6B m d1...dk NUL</b>
<b>Print Bar Code first variation</b>
<b>GS k m n d1...dn - [MP] [*]</b>
<b>1D 6B m n d1...dk</b>
<b>Print Bar Code second variation</b>

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

	<u>First Variation</u>					<u>Second Variation</u>				
<b>ASCII</b>	GS	k	m	d1...dn	NUL	GS	k	m	n	d1...dn
<b>Hexadecimal</b>	1D	6B	m	d1...dn	00	1D	6B	m	n	d1...dn
<b>Decimal</b>	29	107	m	d1...dn	0	29	107	m	n	d1...dn

(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 n).

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.

Rotated barcodes set with small modules (select bar code width command 1D 77 n, n=2 and barcodes in any orientation are printed at low speed, for better readability.

**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 specific Character (\*) (NULL or ~NULL)

**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	0
1	UPC-E	48- 57	Fixed Length: 11, 12	0
2	JAN13 (EAN)	48- 57	Fixed Length: 12, 13	0
3	JAN8 (EAN)	48- 57	Fixed Length: 7,8	0
4	Code 39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) <i>d1</i> = <i>dk</i> = 42 (start/stop code is supplied by printer if necessary)	Variable Length	0
5	Interleaved 2 of 5	48- 57	Variable Length (Even Number)	0
6	Coda bar	65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58	Variable Length	0
11	Code 93	0-127	Variable	255
12	Code 128	0-105 <i>d1</i> = 103-105 (must be a Start code) <i>d2</i> = 0-102 (data bytes) (Stop code is provided by the printer )	Variable	255

**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 value of *n* specified length of byte.

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) <i>d1</i> = <i>dk</i> = 42 (start/stop code is supplied by printer if necessary)	Variable
70	Interleaved 2 of 5 (ITF)	48- 57	Variable (Even Number)
71	CODABAR (NW-7)	65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58	Variable
72	Code 93	0-127	Variable
73	Code 128	0-105 <i>d1</i> = 103-105 (must be a Start code) <i>d2</i> = 0-102 (data bytes) (Stop code is provided by the printer )	Variable

**GS 1 m - [MP] [DBG]**  
**1D 6C m**  
**Transmit Selected A/D Channel**

**Synopsis:** Transmit selected A/D channel (Voltage, Temperature ...).

**ASCII** GS 1 *m*

**Hexadecimal** **1D 6C m**

**Decimal** 29 108 *m*

**Operand:** *m* = Selected channel :

**Value of *m*** 1 = Sensor Paper Out value.

2 = No used.

3 = No used.

4 = Sensor Door value.

5 = No used.

6 = No used.

8 = Power Supply Voltage value.

9 = Temperature Head value.

10 = No used.

11 = No used.

**Returns:** 1 Byte , see below

**Limit reply:**  $00 \leq \text{Byte} \leq 255$  ;  $00 \leq \text{Byte} \leq \text{FF}$

**Description:** Returns the value of sensors, voltage or temperature or reference.

**Note :** If *m* no defined, reply only 255 decimal or FF hexadecimal.

See also commands (1F 0A 84 , 1F 0A ...)

**GS m nthick nthin [MP]**  
**1D 6D nthick nthin**  
**Set Bar Code Aspect Ratio (ITF and Code39 only)**

**Synopsis:** Set Bar code aspect ratio (ITF and Code39 only).

**ASCII** GS *m nthick nthin*

**Hexadecimal** **1D 6D nthick nthin**

**Decimal** 29 109 *nthick nthin*

**Value of** *nthick*  $2 \leq \text{nthick} \leq 6$  *nthick* > *nthin*

**Value of** *nthin*  $1 \leq \text{nthin} \leq 5$

**Default:** *nthick* = 2

*nthin* = 1

**Description:** For ITF and Code39 bar codes, set elementary bar thickness for thin and thick bars.

**GS s n - [MP]**

**1D 72 n**

**Transmit status (Paper sensor Status, Flash memory User Sector status).**

**Synopsis:** Transmit status (Paper sensor Status, Flash memory User Sector status).

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

**Operand:** n = Mode selection  
**Value of n** 1, 49 = Paper sensor Status  
 2, 50 = Reserved  
 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:** 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 Present.
	On	01	1	Paper exhausted.
1	Off	00	0	Cover Closed.
	On	02	2	Cover Open.
2	Off	00	0	Paper Present.
	On	04	4	Paper exhausted.
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	Flash Logo area adequate, definition stored.
	On	08	8	Flash logo area not adequate.
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.

**GS s m n - [MP]**  
**1D 73 m n**  
**Store Selected Sensor Threshold**

**Synopsis:** This command configures the sensors detection threshold (NVM).

**ASCII** GS s m n

**Hexadecimal** 1D 73 m n

**Decimal** 29 115 m n

**Operands :** m = Sensor select  
n = Threshold value

**Limit:** Dec:  $0 \leq m \leq 7$   
Hex:  $00 \leq m \leq 07$   
See Table below

**Description:** This command will store the sensor detection threshold in non-volatile memory (NVM).

**Note:** This command must be followed by a reset.

"GS s" OPERAND DEFINITION						
<i>m</i>		Sensor			<i>n</i> (Decimal)	
Decimal	Hex	Connector	Sensor	Mechanism	Limit	Default
0	00	-	-	-	-	-
1	01	J3-26	Paper Out	ASTERON	$0 \leq n \leq 255$	128
2	02	-	-	-	-	-
3	03	-	-	-	-	-
4	04	J3-23	Door Open	ASTERON	N/A	N/A
5	05	-	-	-	-	-
6	06	-	-	-	-	-
7	07	-	-	-	-	-

**GS u d0 ... d9 - [MP]**

**1D 75 d0 ... d9**

**Store User Revision Number**

**Synopsis:** Store user revision number.

**ASCII** GS u d0 ... d9

**Hexadecimal** 1D 75 d0 ... d9

**Decimal** 29 117 d0 ... d9

**Operand :** dn = downloaded revision number

**Limits** Decimal :  $32 \leq dn \leq 126$

Hex :  $20 \leq dn \leq 7E$

**Default:** Decimal : dn = 47

Hex : dn = 30

**Description:** This command will store a 10-character user defined revision number downloaded to the printer.

**Note:** The user defined revision number is printed on the configuration (*self test - diagnostic form*).

**GS v 0 m xL xH yL yH d1 ... dk - [MP]**

**1D 76 30 m xL xH yL yH d1 ... dk**

**Print Raster Bit Image**

**Synopsis:** Print raster bit image.

**ASCII** GS U 0 m xL xH yL yH d1 ... dk

**Hexadecimal** 1D 76 30 m xL xH yL yH d1 ... dk

**Decimal** 29 117 48 m xL xH yL yH d1 ... dk

**Operand :** m = Selects Raster bit-image mode.

$(xL + xH*256) = \text{Width}$

$(yL + yH*256) = \text{Height}$

k = (Width \* Height)

**Limits** Decimal : m = 0 or 48

Hex : m = 00 or 30

Decimal :  $1 \leq \text{Width} \leq 48$

Hex :  $01 \leq \text{Width} \leq 30$

Decimal :  $1 \leq \text{Height} \leq 65535$

Hex :  $01 \leq \text{Height} \leq \text{FFFF}$

**Description:** Print windows raster bit image.

**Note:** When Width or Height is out of the specified range, the command is ignored.

<i>m</i>	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	8 dots/mm	8 dots/mm

**GS w n - [MP] [\*]**
**1D 77 n**
**Select Bar Code Width**

**Synopsis:** Select bar code width.

**ASCII** GS w n

**Hexadecimal** 1D 77 n

**Decimal** 29 119 n

**Operand:** n = thickness of thin line in dots.

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

**Default** 3

**Formulas**  $n/203$  inch ( $n/8$  mm).  
Thick line is always  $n*2$  dots.

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

**Note :** If  $n=1$ , then the thin bars will be 1 dot in the thickness and thick bars will be 2 dots.

**GS x - [MP]**
**1D 78**
**Transmit User Revision Number**

**Synopsis:** Transmit user revision number.

**ASCII** GS x

**Hexadecimal** 1D 78

**Decimal** 29 120

**Description:** This command will transmit the 10-character printable ASCII user defined revision number.

**Note :** The returned revision number may contain a bit pattern that is valid for returned status. Care should be taken not to confuse this returned data with any other returned data.

**GS <sup>2</sup> - [BP]**
**1D FD**
**Return EEPROM Type**

**Synopsis:** Return Non-Volatile Memory type.

**ASCII** GS <sup>2</sup>

**Hexadecimal** 1D FD

**Decimal** 29 253

**Description:** Reply one byte. "I" for internal NVM.

**GS ■ - [BP]**

**1D FE**

**Return Flash Memory Type**

**Synopsis:** Return flash type.

**ASCII** GS ■

**Hexadecimal** 1D FE

**Decimal** 29 254

**Description:** Reply five bytes. "No ID" for internal flash.

**GS SP – [BP] [MP] [\*]**

**1D FF**

**Reset Firmware**

**Synopsis:** Reset firmware.

**ASCII** GS SP

**Hexadecimal** 1D FF

**Decimal** 29 255

**Description:** Reboots the printer.

**US SOH d1...dn - [BP]**

**1F 01 d1...dn**

**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*

**Value and range** n = 36864 (Actual Boot Loader size 36Ko)

n = 6144 (Actual Boot Strap size 6Ko)

**Description:** Wait for new boot code to be downloaded, then check CRC on this new boot code, and if valid, boot code sector is erased and reprogrammed with new code. Printer automatically reboots after program sequence is complete (Boot = boot Strap + Boot Loader).

**Note :** Available only in download mode.

During erase and download sequence, power supply must be maintained at all times and no reset sequence should be performed. (See also Command 1F 09...)

US STX n1 n2 n3 n4 n5 n6 - [BP] [\*]

1F 02 n1 n2 n3 n4 n5 n6

**Set Communication Interface Parameters in NVM**

**Synopsis:** Set communication interface parameters (NVM).

<b>ASCII</b>	US	STX	n1	n2	n3	n4	n5	n6
<b>Hexadecimal</b>	1F	02	n1	n2	n3	n4	n5	n6
<b>Decimal</b>	31	2	n1	n2	n3	n4	n5	n6

**Operands:** n1 Interface selection  
n2 – n6 Parameters  
**Default** (\*) (USB, 4 End points).

<b>Bytes Values :</b>		Hexadecimal	
n1 :	-	= 03 = Interface USB	(*)
n2 :	-	= 00 = 3 End-Points.	
“	“	= 01 = 4 End-Points.	(*)
n3 :	Fixed to 0	Undefined.	
n4 :	Fixed to 0	Undefined.	
n5 :	Fixed to 0	Undefined.	
n6 :	Fixed to 0	Undefined.	

**Description:** This command will store the *communication* options in non-volatile memory.

- Notes:**
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).

**US ETX NUL n - [MP] [\*]**

**1F 03 00 n**

**Set Diagnostic Mode in NVM**

**Synopsis:** Set diagnostic mode in Non-Volatile Memory.

<b>ASCII</b>	US	ETX	NUL	n
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>00</b>	<b>n</b>
<b>Decimal</b>	31	3	0	n

<b>Operand:</b>	n	= mode selection	
<b>Value Decimal</b>	0	Normal Operation	
	1	Data Scope Mode	= Print all data received in ascii sequence.
	2	Receipt Print Test	= Push Button, print all code Page in Compressed Pitch.
	3	Demo Mode	= Push button, print 4 logo(s) if defined.
	4	No used. Normal Mode	= -.
	5	Com Data Scope Mode	= Same Data Scope Mode, but data transmit on USB.
<b>Default</b>	0		

**Limit:**  
 Dec :  $0 \leq n \leq 5$   
 Hex:  $00 \leq n \leq 05$ ,

**Description:** This command will store the printer diagnostics mode in Non-Volatile Memory.  
 This mode is used to select a test mode

**Note:** This command must be followed by a reset.  
 Exit Data Scope Mode or exit COM Scope Mode send command sequence "1F 03 0000" and stop-start power supply.

**US ETX EOT m - [MP]**

**1F 03 04 m**

**Set Maximum Power Consumption in NVM**

**Synopsis:** Set maximum power consumption in Non-Volatile Memory.

<b>ASCII</b>	US	ETX	EOT	m
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>04</b>	<b>m</b>
<b>Decimal</b>	31	3	4	m

<b>Operand:</b>	m	= Power in Watt
<b>Default Dec :</b>	18	Watt
<b>Hex:</b>	12	

**Limit:**  
 Dec:  $15 \leq m \leq 255$   
 Hex:  $12 \leq m \leq FF$

**Description:** This command will store the *power consumption* in non-volatile memory.

**Note:** This command must be followed by a reset.

**Example:** Dec. Hex. Value

15	0E	15 Watt
30	1E	30 Watt
55	37	55 Watt

**US ETX VT m - [MP]**

**1F 03 0F m**

**Set Default Font in NVM**

**Synopsis:** Set default resident or user font option in Non-Volatile Memory.

<b>ASCII</b>	US	ETX	VT	m
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>0F</b>	<b>m</b>
<b>Decimal</b>	31	3	15	m

**Operand:** m = Mode selection

<b>Value Decimal:</b>	0	Resident font n°0 (12x24 = Pica).
	1	User font.
	2	Resident font n°1 (16x24 = Elite).
	3	Resident font n°2. Same (*).
	48	Easy font n°0.
	49	Easy font n°1.
	50	Easy font n°2.
	51	Easy font n°3.

**Default:** 2 (16x24 Elite) (\*)

**Limit:** Dec:  $0 \leq m \leq 3$  and  $48 \leq m \leq 52$

Hex:  $00 \leq m \leq 03$  and  $30 \leq m \leq 34$

**Description:** This command will store the default font option in non-volatile memory.

**Notes:** The default font selects which font will be initially used by the printer.

If user or easy font is selected and no present in memory, the default font n°2 is used.

This command must be followed by a reset.

**US ETX Ç m - [MP]**

**1F 03 80 m**

**Set Default Code Page in NVM**

**Synopsis:** Set default code page option in Non-Volatile Memory.

<b>ASCII</b>	US	ETX	Ç	m
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>80</b>	<b>m</b>
<b>Decimal</b>	31	3	128	m

**Operand:** m = Mode Code Page

<b>Value Decimal:</b>	0	437	: US
	1	850	: Multilingual
	2	852	: Latin 2, Slavic
	3	860	: Portuguese
	4	863	: Canadian French
	5	865	: Nordic
	6	858	: Multilingual Latin 1 + Euro
	7	866	: Cyrillic, Russian
	8	1252	: Windows, Latin 1
	9	862	: Hebrew
	10	-	: KATAKANA
	11	1253	: Windows, Greek
	12	737	: Greek

**Default:** 0 (437)

**Limit:**  
Dec:  $0 \leq m \leq 12$   
Hex:  $00 \leq m \leq 0B$

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

**Notes:** 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.

**US ETX ě m - [MP]**

**1F 03 89 m**

**Set Cover sensor option in NVM**

**Synopsis:** Set cover sensor option in Non-Volatile Memory.

**ASCII** US ETX ě m

**Hexadecimal** 1F 03 89 m

**Decimal** 31 3 143 m

**Operand:** m = Select Cover option

**Value Decimal:** 0 Disable

1 Present

**Default:** 0 (Disable)

**Limit:** Dec:  $0 \leq m \leq 1$

Hex:  $00 \leq m \leq 01$

**Description:** This command will store the *Cover Sensor* option in non-volatile memory.  
When disable, cover condition is never checked.

**Note:** This command must be followed by a reset.

**US ETX É m - [MP]**

**1F 03 90 m**

**Set Fault Recovery Mode in NVM**

**Synopsis:** Select fault recovery mode in Non-Volatile Memory..

**ASCII** US ETX É m

**Hexadecimal** 1F 03 90 m

**Decimal** 31 3 144 m

**Operand:** m = Mode selection

**Value Decimal:** 0 Automatic Restart

1 Host Controlled

**Default:** 0 (automatic restart)

**Limit:** Dec:  $0 \leq m \leq 1$

Hex:  $00 \leq m \leq 01$

**Description:** This command will store the *fault recovery* mode option in non-volatile memory.

**Notes:** This mode is used to select the printer behaviour after all fault conditions are cleared : The printer can either automatically restart from where it stops, or wait until it receives a specific real time command "Real Time Recovery From Fault"

This command must be followed by a reset.

**US ETX æ m - [MP]**
**1F 03 91 m**
**Set Low Voltage Detection Mode in NVM**

**Synopsis:** Select low voltage detection mode in Non-Volatile Memory.

<b>ASCII</b>	US	ETX	æ	m
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>91</b>	<b>m</b>
<b>Decimal</b>	31	3	145	m

**Operand:** m = Mode selection

**Value Decimal:**  
 0 Disabled  
 1 Enabled

**Default:** 1 (Enabled)

**Limit:**  
 Dec:  $0 \leq m \leq 1$   
 Hex:  $00 \leq m \leq 01$

**Description:** This command will store the *low voltage detection* mode option in non-volatile memory.

**Notes:** When enabled, the low voltage error condition arises if the voltage drops below 4.2V and cleared to 4.7V. When disabled, low voltage condition is never checked. This command must be followed by a reset.

**US ETX ô m - [MP]**
**1F 03 93 m**
**Set Carriage Return Usage in NVM**

**Synopsis:** Select carriage return usage option in Non-Volatile Memory.

<b>ASCII</b>	US	ETX	ô	m
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>93</b>	<b>m</b>
<b>Decimal</b>	31	3	147	m

**Operand:** m = Select mode

**Value Decimal:**  
 0 Used as Print Command  
 1 Ignored

**Default:** 1 (Ignored)

**Limit:**  
 Dec:  $0 \leq m \leq 1$   
 Hex:  $00 \leq m \leq 01$

**Description:** This command will store the carriage return usage option in non-volatile memory.

**Notes:** This option determines how carriage return command is processed. This command must be followed by a reset.

**US ETX ö m - [MP]**

**1F 03 94 m**

**Set Lines per Inch Default Setting in NVM**

**Synopsis:** Select lines per inch setting in Non-Volatile Memory..

<b>ASCII</b>	US	ETX	ö	M
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>94</b>	<b>M</b>
<b>Decimal</b>	31	3	148	M

**Operand:** m = Select LPI mode

**Value Decimal:**

0	= 6
1	= 7.52
2	= 8.13

**Default:** 2 (8.13 Line Per Inch)

**Limit:**

Dec:	$0 \leq m \leq 2$
Hex:	$00 \leq m \leq 02$

**Description:** This command will store the lines per Inch default setting option in non-volatile memory.

**Notes:** This option determines the LPI used after reset.  
This command must be followed by a reset.

**US ETX Ø m - [MP]**

**1F 03 9D m**

**Set USM Count Trigger Mode in NVM**

**Synopsis:** Set USM count trigger mode in Non-Volatile Memory.

<b>ASCII</b>	US	ETX	Ø	m
<b>Hexadecimal</b>	<b>1F</b>	<b>03</b>	<b>9D</b>	<b>m</b>
<b>Decimal</b>	31	3	157	m

**Operand:**

m	= Select Mode
0	Normal (4 bytes without count)
1	Extended (5 bytes)

**Default:** 0 (Normal 4 bytes)

**Limit:**

Dec:	$0 \leq m \leq 1$
Hex:	$00 \leq m \leq 01$

**Description:** This command will store the USM count trigger mode option in non-volatile memory.

**Notes:** This option determines whether position count change can originate USM messages :

- In normal mode, position count change doesn't generate USM message.
- In extended mode, position count change does generate USM message.

This command must be followed by a reset.  
See also command Enable/disable Auto Status Back (1D 61 n).

**US ETX Ø m - [MP] [\*]**

**1F 03 A5 s dL dH**

**Set Multi-Heat Mode in NVM**

**Synopsis:** Set and save Multi-Heat mode configuration in Non Volatile Memory.

**ASCII** US ETX Ø s dL dH

**Hexadecimal** 1F 03 A5 s dL dH

**Decimal** 31 3 165 s dL dH

**Operand:** s = Select Multi-heat Mode.  
0 Mode Off  
1 Mode On.

**Default:** 0 (Multi-heat Mode Off).

**Limit:** Dec:  $0 \leq s \leq 1$   
Hex:  $00 \leq s \leq 01$

**Operands** dL = Lsb number dots (1 byte).  
dH = Msb number dots (1 byte).  
**Number dots** = (dL + (dH \* 256))

**Limit:** Dec:  $32 \leq \text{Number dots} \leq 384$   
Hex:  $20 \leq \text{Number dots} \leq 0180$

**Description:** This command will store the Multi-Heat mode option and to configure the peak current with the number of dots on in same time in non-volatile memory.

**Notes:** This command must be followed by a reset.  
See also command (1D 25 n dL dH).

**Formulas:** Current Head (A) = ((Vch/Rhdot)\*Number dots)  
- Vch = Head Power Supply [4.5V;8.0V]  
- Rdot nominal = 176Ohm nominal.  
- Number Dots = [32; 384].  
- Other Power Board = ~4W (with current paper feed motor) **TBC!**

**Example:** Rdot = 176 Ohm ; Vch = 8.0V ; Number dots = 50 → Peak current Head = 2.27A

**US ETX Ę n - [MP]**

**1F 03 D3 n**

**Select or Cancel Driver Easy Mode in NVM**

**Synopsis:** Select or cancel and save Driver Easy Mode in Non Volatile Memory.

**ASCII** US ETX Ę n

**Hexadecimal** 1F 03 D3 n

**Decimal** 31 3 211 n

**Operand:** n = Select Driver Easy Mode.

0 Mode disabled.

1 Mode Enabled.

**Default:** 0 (Driver Easy Mode disabled).

**Limit** Dec:  $0 \leq s \leq 1$

Hex:  $00 \leq s \leq 01$

**Description:** Driver Easy Mode Enabled :

The real time commands are available on the Bulk Out (Received data printer) End Point.

And real time commands replies are available on the Bulk IN (transmit data to host) End Point.

**Note:** All data (Graphics data, text data ...) received on the Bulk Out are interpreted and tested in real time commands!

See also USM Command; automatic reply on the Bulk In (transmit data to host), Code (1D 61 n).

**US ETX Ĩ n - [MP]**

**1F 03 D8 n**

**Select flash User Data storage Byte Mode NVM**

**Synopsis:** Select User data storage Byte Mode in Non Volatile Memory.

**ASCII** US ETX Ĩ n

**Hexadecimal** 1F 03 D8 n

**Decimal** 31 3 216 n

**Operand:** n

0 2 bytes Mode.

1 1 Byte Mode.

**Default:** 1 (1 byte Mode).

**Limit** Dec:  $0 \leq s \leq 1$

Hex:  $00 \leq s \leq 01$

**Description:** Select byte organization for User flash data storage.

**Note:** In one byte Mode 1 Sector is 32Kb.

In two bytes mode 1 sector is 64Kb.

**US ENQ n - [MP]**

**1F 05 n**

**Select Superscript or Subscript Modes**

**Synopsis:** Select superscript or subscript mode (on/off).

**ASCII** US ENQ *n*

**Hexadecimal** 1F 05 **n**

**Decimal** 31 5 *n*

**Operand:**

- n* = Select Size Mode
- 0 Normal character size.
- 1 Select subscript size.
- 2 Select superscript size.

**Default:** 0 (Normal size)

**Limit:**

- Dec:  $0 \leq n \leq 2$
- Hex:  $00 \leq n \leq 02$

**Description:** Turns superscript or subscript modes on or off. This attribute may be combined with other characters size settings commands (12, 13, 1B 21 n, 1D 21 n, ...)

**Note:** This command is ignored if *n* is out of the specified range.

**US BEL n - [MP]**

**1F 07 n**

**Read Configuration Setting (NVM)**

**Synopsis:** Read configuration setting in Non-Volatile Memory.

**ASCII** US BEL n

**Hexadecimal** 1F 07 n

**Decimal** 31 5 n

**Operand:** n = Header byte

**Limit:** See table below.

**Reply bytes**

- (1) Header byte = n
- (2) Configuration Setting made of one or more bytes, and using the same values as in the command used to set those parameters.

**Description:** Reply configuration setting (see table below).

**Note:** This command is ignored if n is out of the specified range.

**Example:** Command (1F 07 80) returns the default code page.

If the current paper type setting is "CP437", the returned string would be 80 00 80 as header byte for command 1F 07 80, 00 as seen in parameter table for command 1F 03 80

n (HEX)	Read Setting	See Command
00	Read Set Diagnostics mode	1F 03 00
04	Read Max Power	1F 03 04
0F	Read Set Default Font	1F 03 0F
10	Read Communication	1F 02
1A	Read Power Supply Coefficient	1F 0A 10 ...
46	Read Max Print Speed	1F 0C 53 50 46
4A	Read Print Density	1F 0B 4E 52 4A
73	<sup>(1)</sup> Read Sensor Threshold	1D 73 ...
77	Read Set Watchdog Mode	1F 0A 77
80	Read Set default code page	1F 03 80
89	Read Set Cover sensor option	1F 03 89
8B	Read Mechanism Type (0x18)	-
90	Read Fault Recovery	1F 03 90
91	Read Low votage detection	1F 03 91
93	Read Carriage Return Usage	1F 03 93
94	Read Default LPI	1F 03 94
9D	Read USM Count Mode	1F 03 9D
A5	Read Multi-heat Mode	1F 03 A5
D3	Read Driver Easy Mode	1F 03 D3
D8	Read Used storage Byte Mode	1F 03 D8

<sup>(1)</sup> An additional parameter is required for sensor selection.

**US BS n - [BP]**

**1F 08 n**

**Set Boot Size**

**Synopsis:** Set Boot size.  
**ASCII** US BS *n*  
**Hexadecimal** **1F 08 n**  
**Decimal** 31 8 *n*

**Operand:** n = New Size Boot

**Formulas:** Size = n\*1024 bytes

**Default:** 36 (Current size)

**Limit:**  
 Dec:  $0 \leq n \leq 255$   
 Hex:  $00 \leq n \leq FF$

**Description:** Set new boot loader size.  
 Select Boot sector erase.

**Note:** Available only in download mode.

**US HT d1...dn - [BP]**

**1F 09 d1...dn**

**Erase Boot Sector + Download new Boot code with Reply Information**

**Synopsis:** Erase boot sector and download new boot code with reply information.

**ASCII** US HT *d1...dn*  
**Hexadecimal** **1F 09 d1...dn**  
**Decimal** 31 9 *d1...dn*

**Value and range**  
 n = 36864 (Actual Boot Loader size 36Ko)  
 n = 6144 (Actual Boot Strap size 6Ko)

**Reply byte:**

(1)	Received data	→ Reply byte = 1
(2)	Check received data	→ Reply byte = ACK or NAK
(3)	Erase + Downloaded data	→ Reply byte = 2
(4)	Check download data	→ Reply byte = ACK or NAK

ASCII:	ACK	: OK
	NACK	: NOK
Hex:	06	: OK
	15	: Fault

**Description:** Wait for new boot code to be downloaded, then check CRC on this new boot code, and if valid, boot code sector is erased and reprogrammed with new code. Printer automatically reboots after program sequence is complete (Boot = Boot Strap + Boot Loader).

**Note:** Available only in download mode. During erase and download sequence, power supply must be maintained

at all times and no reset sequence should be performed. (See also command 1F 01 ...)

**US LF ENQ n NUL NUL – [MP] [DBG]**

**1F 0A 05 n 00 00**

**Read PWM Current Value**

<b>Synopsis:</b>	Read current PWM Value.					
<b>ASCII</b>	US	VT	ENQ	<i>n</i>	00	00
<b>Hexadecimal</b>	<b>1F</b>	<b>0A</b>	<b>05</b>	<b>n</b>	<b>00</b>	<b>00</b>
<b>Decimal</b>	31	10	5	<i>n</i>	0	0

**Operand:**        **n**        = Select PWM.  
                   " A"        0x41 = Paper Feed Motor.

**Reply:**                « r=xx ; p=yyyy ACK »  
                   **r**        = Rapport cyclic (1 byte).  
                   **p**        = Period in µS (2 bytes).  
                   **ACK**    = 0x06

**Description:**        Returns the value of PWM.

**US LF ENQ s n m - [MP] [DBG]**

**1F 0A 05 s n m**

**Write PWM Current Value**

<b>Synopsis:</b>	Write current PWM Value.					
<b>ASCII</b>	US	VT	ENQ	<i>s</i>	<i>n</i>	<i>m</i>
<b>Hexadecimal</b>	<b>1F</b>	<b>0A</b>	<b>05</b>	<b>s</b>	<b>n</b>	<b>m</b>
<b>Decimal</b>	31	10	5	<i>s</i>	<i>n</i>	<i>m</i>

**Operand:**        **s**        = Select PWM.  
                   " A"        0x41 = Paper Feed Motor.

**Operand:**        **n**        = Rapport Cyclic.

**Default**            12

**Limit:**            Dec: 00 ≤ *n* ≤ m+1

Hex: 00 ≤ *n* ≤ m+1

**Operand:**        **m**        = period (in µs).

**Default**            33

**Limit:**            Dec: 00 ≤ *n* ≤ 255

Hex: 00 ≤ *n* ≤ FF

**Description:**        Set register PWM TOF or Motor values.

**Note :**              Period default 120 µS.

After reset this parameters values is lost. Restore default value of NVM.

**US LF n - [MP] [DBG]**

**1F 0A 10 n**

**Set Power Supply coefficient in NVM**

**Synopsis:** Power supply coefficient.

**ASCII** US LF \_ n

**Hexadecimal** 1F 0A 10 n

**Decimal** 31 10 16 n

**Operand :** Hexadecimal Decimal

**Value of n:**  $01 \leq n \leq FF$   $1 \leq n \leq 255$

**Default :** 28 40%

**Description:** Percentage of parameters for power supply.

**Note:** This command must be followed by a reset.

**US LF MS - [MP] [DBG]**

**1F 0A 4D 53**

**Set Mass-Storage Demo Mode**

**Synopsis:** Go to Mass storage Mode.

**ASCII** US LF M S

**Hexadecimal** 1F 0A 4D 53

**Decimal** 31 10 77 83

**Description:** (Ok reply 0x300x31).After cold reset, enter in demo mass storage mode.

For quite mass storage mode. Disconnet cable of power supply and wait during 10 secondes.

**Note:** This command must be followed by a reset.

**US LF R = n - [BP]**

**1F 0A 52 3D n**

**Set Rx Buffer Size in NVM**

**Synopsis:** Change size value of RX Buffer and store value in Non-Volatile Memory.

<b>ASCII</b>	US	LF	R	=	n
<b>Hexadecimal</b>	<b>1F</b>	<b>0A</b>	<b>52</b>	<b>3D</b>	<b>n</b>
<b>Decimal</b>	31	10	82	61	n

<b>Operand :</b>	<b>Hexadecimal</b>	<b>Decimal</b>	
<b>Value of n:</b>	01 ≤ n ≤ 04	1 ≤ n ≤ 4	Value n in Kbytes.
<b>Default :</b>	02	2	(2 Kbytes = 2048 bytes).
<b>Formulas :</b>	(n Kbytes * 1024) = Number Bytes.		

**Description:** Set Rx Buffer Size in Kbytes and store value (increase or decrease SRAM memory User).

Rx buffer is the Bulk Out end point USB interfaces.

- Note:**
- (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).

**US LF I = n1 n2 - [BP][MP]**

**1F 0A 6C 3D n1 n2**

**Read Layers Information**

**Synopsis:** Read layers information (CRC and version).

<b>ASCII</b>	US	LF	I	=	n1	n2
<b>Hexadecimal</b>	<b>1F</b>	<b>0A</b>	<b>6C</b>	<b>3D</b>	<b>n1</b>	<b>n2</b>
<b>Decimal</b>	31	10	108	61	n1	n2

- (n1 n2) ↔ parameters = Select layer (2 bytes)

<b>Operand</b>	<b>ASCII</b>	<b>Hexadecimal</b>	<b>Description</b>
<b>Values of Op:</b>	BS	<b>42 53</b>	- Read information Boot Strap layer.
	BL	<b>42 4C</b>	- Read information Boot Loader layer.
	CL	<b>43 4C</b>	- Read information Client or main application layer.

**Description:** Reply layer CRC (CCCC) and version number (v.vv) and terminated character ACK (= 06)  
 Reply format : BS = CCCC ; v.vv ACK or BL = CCCC ; v.vv ACK or CL = CCCC ; v.vv ACK  
 If command error return NAK = 0x15.

**Note:** If main application, Client is absent reply format : CL = DEAD ; x.xx ACK

**US LF I = n - [MP] [DBG]**

**1F 0A 74 3D n**

**Read Com Port specific Information**

**Synopsis:** Read Com port specific information.

<b>ASCII</b>	US	LF	t	=	n
<b>Hexadecimal</b>	1F	0A	74	3D	n
<b>Decimal</b>	31	10	116	61	n

<b>Operand :</b>	<b>ASCII</b>	<b>Hexadecimal</b>	<b>Description</b>
<b>Value of n:</b>	D	44	- Read Diagnostic Form.
	E	45	- Read Heating table.
	V	56	- Get current ticket speed.

**Description:** Read Com port (= USB) information.

**US LF w = n - [BP] [DBG]**

**1F 0A 77 3D n**

**Set or Reset Watchdog in NVM**

**Synopsis:** Turn on/off watchdog.

<b>ASCII</b>	US	LF	w	=	n
<b>Hexadecimal</b>	1F	0A	77	3D	n
<b>Decimal</b>	31	10	119	61	n

<b>Operand :</b>	<b>ASCII</b>	<b>Hexadecimal</b>	<b>Description</b>
<b>Value of n:</b>	N	4E	Watchdog Off.
	Y	59	Watchdog On (Default).

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

- Notes:**
1. This command is processed only in boot mode. If the printer is running in normal mode, send first command "switch to BootMode" (1B 5B 7D).
  2. This command must be followed by "Printer Reset" command (1D FF).

**US LF n - [MP]**  
**1F 0A n (= 84, 85)**  
**Voltage and Temperature Monitoring**

**Synopsis:** Voltage and temperature monitoring.

**ASCII** US LF n  
**Hexadecimal** 1F 0A n  
**Decimal** 31 10 n

**Operand :** n = select reply type

**Limits:** Dec:  $132 \leq n \leq 133$

Hexa:  $84 \leq n \leq 85$

**Return :** Always returns 7 Bytes (see tables below)  
 Command ID + zero terminated ASCII string.

**Description:** Returns the results of latest voltage and temperature measurements.  
 See comands below.

<b>RETURNED STATUS DEFINITION</b>		
<b>n = 0x84: Read Voltage (in Volt)</b>		
<b>Byte</b>	<b>Function</b>	<b>Value</b>
0	Command Id	0x84
1-5	ASCII string	...
6	End of String	0x00

<b>RETURNED STATUS DEFINITION</b>		
<b>n = 0x85: Read Print head Temperature (in °C)</b>		
<b>Byte</b>	<b>Function</b>	<b>Value</b>
0	Command Id	0x85
1-5	ASCII string	...
6	End of String	0x00

**US LF è - [MP] [DBG]**  
**1F 0A 8A**  
**Print Heating Time Table**

**Synopsis:** Print heating time table.

**ASCII** US LF è  
**Hexadecimal** 1F 0A 8A  
**Decimal** 31 10 138

**Description:** Print heating time table.

**US LF ï - [MP] [DBG]**

**1F 0A 8B n**

**Set GFX Print Area Width**

**Synopsis:** Set GFX print area width.

**ASCII** US LF ï n

**Hexadecimal** 1F 0A 8B n

**Decimal** 31 10 139 n

**Operand :** n = select width

**Default Dec:** 48

**Limits:** Dec:  $1 \leq n \leq 48$

Hexa:  $01 \leq n \leq 30$

**Description:** Set graphic print area width. See graphics code (11).

**US LF Ü 1 m - [MP] [DBG]**

**1F 0A 9A 1 m**

**Save Current (mA) Paper Feed Motor in NVM**

**Synopsis:** Set current paper feed motor value in NVM.

**ASCII** US LF Ü 1 m

**Hexadecimal** 1F 0A 9A 1 m

**Decimal** 31 10 154 1 m

**Operands:** 1 = LSB value of c.

m = MSB value of c.

**Formulas:**  $c = ((m \times 256) + 1)$  Current c in mA.

**Limits:** Dec:  $251 \leq c \leq 750$

Hexa:  $0FB \leq c \leq 2EE$

**Description:** This command will store the Motor current value in non-volatile memory.

**Note:** This command must be followed by a reset.

**US LF ø - [MP] [DBG]**

**1F 0A 9B**

**Read Current Paper Feed Motor in NVM**

**Synopsis:** Read current paper feed motor value.

<b>ASCII</b>	US	LF	ø
<b>Hexadecimal</b>	<b>1F</b>	<b>0A</b>	<b>9B</b>
<b>Decimal</b>	31	10	155

**Reply:** 2 bytes = b0 b1 (LSB MSB)

**Formulas:**  $(b0+b1 \times 256) = \text{Current mA}$

**Description:** Read Current (mA) paper feed motor.

**Example:** Hexadecimal value byte0 = F4 and byte1 = 01 → Decimal value Current = 500 mA.

**US VT NR J n - [MP] [\*]**

**1F 0B 4E 52 4A n**

**Set Print Density in NVM**

**Synopsis:** Set print density (NVM).

<b>ASCII</b>	US	VT	N	R	J	n
<b>Hexadecimal</b>	<b>1F</b>	<b>0B</b>	<b>4E</b>	<b>52</b>	<b>4A</b>	<b>n</b>
<b>Decimal</b>	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 *print density* value in non-volatile memory.

**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.

**US FF S P F n - [MP]**

**1F 0C 53 50 46 nL nH**

**Set Max Speed in NVM**

**Synopsis:** Set maximum speed (NVM).

<b>ASCII</b>	US	FF	S	P	F	nL	nH
<b>Hexadecimal</b>	<b>1F</b>	<b>0C</b>	<b>53</b>	<b>50</b>	<b>46</b>	<b>nL</b>	<b>nH</b>
<b>Decimal</b>	31	12	83	83	65	nL	nH

**Oper and:** n = (nL+256xnH) = Select speed ( mm/s)

**Default Dec:** 150

**Limit:** Dec:  $30 \leq n \leq 80$

Hex:  $001E \leq n \leq 0050$

**Description:** Set maximum speed.

This command will store the Max speed value in non-volatile memory.

**Notes:** Under 6.00V (power supply voltage) and if multi-heat mode On this code is no valid. Maximum speed is fixed.

This command must be followed by a reset.

**US FF S A F n - [BP]**

**1F 0C 53 41 46 n**

**Boot Safety Mode**

**Synopsis:** Set/Reset Boot safety mode.

<b>ASCII</b>	US	FF	S	A	F	n
<b>Hexadecimal</b>	<b>1F</b>	<b>0C</b>	<b>53</b>	<b>41</b>	<b>46</b>	<b>n</b>
<b>Decimal</b>	31	12	83	65	70	n

**Oper and:** n = 00 Disabled safety mode

= 01 Enabled safety mode

**Limit:** Dec:  $0 \leq n \leq 1$

Hex:  $00 \leq n \leq 01$

**Default:** n = 01 Enabled

**Description:** Disable or enable safety mode for Boot download.

**US CR C L E n - [BP]**

**1F 0D 43 4C 45 n**

**Reset Non-Volatile-Memory parameters**

**Synopsis:** Reset NVM parameters.

<b>ASCII</b>	US	CR	C	L	E	n
<b>Hexadecimal</b>	<b>1F</b>	<b>0D</b>	<b>43</b>	<b>4C</b>	<b>45</b>	<b>n</b>
<b>Decimal</b>	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 main program mode, send first command "switch to Boot Mode" (1B 5B 7D).

**US CR D U M - [MP] [DBG]**

**1F 0D 44 55 4D**

**Dump Non-Volatile-Memory parameters**

**Synopsis:** Dump NVM parameters.

<b>ASCII</b>	US	CR	D	U	M
<b>Hexadecimal</b>	<b>1F</b>	<b>0D</b>	<b>44</b>	<b>55</b>	<b>4D</b>
<b>Decimal</b>	31	13	68	85	77

**Limit**  
Dec:  $0 \leq Identify \leq 255$   
Hex:  $00 \leq Identify \leq FF$

**Description:** This command is a dump of non-volatile-memory.  
If parameter defined: Syntax = *Separator* (hexadecimal value = FF), *Identify*, *size (byte number)*, *Value*.  
If parameter no defined: Syntax = *Separator* (hexadecimal value = FF), *Identify*.

**Example:** FF 00 04 BA AA 00 00 FF 01 FF 02 ...  
→ FF = separator, Identify = 00, Size = 04 Bytes, Value = BA AA 00 00,  
→ FF = separator, Identify = 01, (no defined)  
→ FF = separator, ...

**US & H cn cm ln [dnk] ... lm [dmk] - [MP]**

**1F 26 H cn cm ln [dnk] ... lm [dmk]**

**Define User-Defined Character Set with Variables Height**

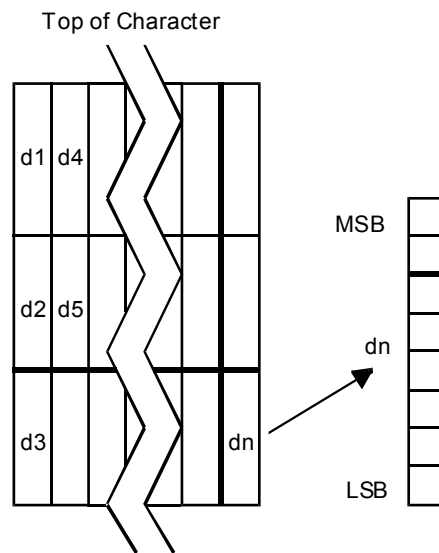
**Synopsis:** Define User-Defined character set with variables height.

<b>ASCII</b>	US	&	H	cn	cm	ln	[dn1 ... dnk]	...	Lm	[dm1 ... dmk]
<b>Hexadecimal</b>	1F	26	H	cn	cm	ln	[dn1 ... dnk]	...	lm	[dm1 ... dmk]
<b>Decimal</b>	31	38	H	cn	cm	ln	[dn1 ... dnk]	...	lm	[dm1 ... dmk]

**Value of range:** H Parameter H indicates character height in number of dots, and does not have to be dividable by 8.  
 From 1 to 8 dots high => 1 data byte per  
 From 9 to 16 dots high => 2 data bytes per column  
 From 17 to 24 dots high => 3 data bytes per column  
 Etc...

**Description:** Command format is similar to existing command (1B 26). The only difference resides in the height encoding H indicates the height in number of dots instead of number of bytes (1B 26) to provide better resolution. Data are still encoded vertically.

**Note :** max dimensions : H max = 64, W max = 48  
 See (1D 22 n) "Select memory type" to save User Defined characters.  
 See chapter "Memory allocation" for information about potential limitations.



**US « BMP File » - [MP]**

**1F 42 4D ...**

**Print BMP Graphics (normal)**

**Synopsis:** Print bitmap monochrome file.

**ASCII** US "BMP file"

**Hexadecimal** 1F "BMP file"

**Decimal** 31 "BMP file"

**Description:** The printer decodes the BMP file header and will save the image data after checking important parameters, such as: Width, Height, and Number of colors (only monochrome images are accepted). Header definition see below.

**Notes:** BMP file images that are not monochrome are ignored

HEADER FILE n1...nX = 10 Data bytes

**Value of n:**

This block of bytes is at the start of the file and is used to identify the file. A typical application reads this block first to ensure that the file is actually a BMP file and that it is not damaged. The first two bytes of the BMP file format are the character 'B' then the character 'M' in 1-byte ascii encoding. All of the integer values are stored in little-endian format (i.e. least-significant byte first).

Offset #	Size	Purpose
0000h	2 bytes	The magic number used to identify the BMP file: 0x42 0x4D (Hex code points for B and M). The following entries are possible: BM - Windows 3.1x, 95, NT, ... etc
0002h	4 bytes	The size of the BMP file in bytes.
0006h	2 bytes	Reserved; actual value depends on the application that creates the image ( 0x00, 0x00)
0008h	2 bytes	Reserved; actual value depends on the application that creates the image (not considered by axiohm) ( 0x00, 0x00)
000Ah	4 bytes	The offset, i.e. starting address, of the byte where the bitmap data can be found.

DIB HEADER n1...nX = 40 Data bytes

**Value of n:**

Only common format is the V3 header will be supported

Offset #	Size	Purpose
40	Windows V3	BITMAPINFOHEADER all Windows versions since Windows 3.0
Eh	4	The size of this header (40 bytes) ( 0x28, 0x00, 0x00, 0x00)
12h	4	The bitmap width in pixels (signed integer).
16h	4	The bitmap height in pixels (signed integer).
1Ah	2	The number of color planes being used. (0x01, 0x00) not used
1Ch	2	The number of bits per pixel, which is the color depth of the image. (Values 4, 8, 16, 24 and 32 not supported). (0x01, 0x00), Pixel white is fixed by a bit to 0, and a pixel black is fixed by a bit at 1
1Eh	4	No compression method implemented ( 0x00, 0x00, 0x00, 0x00)
22h	4	The image size. This is the size of the raw bitmap data (see below), and should not be confused with the file size.
26h	4	The horizontal resolution of the image. (pixel per meter, signed integer)
2Ah	4	The vertical resolution of the image. (pixel per meter, signed integer)
2Eh	4	The number of colors in the color palette, or 0 to default to 2n. ( 0x02, 0x00, 0x00, 0x00)
32h	4	The number of important colors used or 0 when every color is important; generally ignored. ( 0x00, 0x00, 0x00, 0x00)
36h	.....	Start of Bitmap Data (warning Set the sens of image in the printable sens, ( first line received = first line printed )

**US F n - [MP]**  
**1F 46 n**  
**Select Font User**

**Synopsis:** Select font type.

<b>ASCII</b>	US	F	<i>n</i>
<b>Hexadecimal</b>	<b>1F</b>	<b>46</b>	<b>n</b>
<b>Decimal</b>	31	70	<i>n</i>

**Operand:**

<i>n</i>	= font Selection
0	16 x 24 Font A (standard pitch)
1	12 x 24 Font B (compressed pitch)
2	16 x 24 Font C (large pitch = standard pitch)

**Default:** 0

**Limit**

Dec:	$0 \leq n \leq 2$
Hex:	$00 \leq n \leq 02$

**Description:**

**Note :** This command will overwrite the previous font selection made by the (ESC!) command.

**US V – [BP][MP] [\*]**  
**1F 56**  
**Send Printer Software Version**

**Synopsis:** Send printer software version.

<b>ASCII</b>	US	V
<b>Hexadecimal</b>	<b>1F</b>	<b>56</b>
<b>Decimal</b>	31	86

**Return :** 8 bytes ASCII

**Description:** The printer returns 8 bytes containing the boot and Client or Main program version.  
The first 4 bytes returned are an ASCII string for the boot loader version.  
The second 4 bytes are an ASCII string for the main program version.

**Example:** The printer returns 3.84226  
This means the boot loader version is 3.84 and the main program version is 2.26

**US a n – [MP]**  
**1F 61 n**  
**Process Ticket Number**

**Synopsis:** Process ticket number.

**ASCII** US a n

**Hexadecimal** 1F 61 n

**Decimal** 31 97 n

**Value of:**  
n = Select process  
01 Clear Ticket Counter.  
02 Increment Ticket Counter.

**Description:** The ticket counter is a 16-bit counter in memory that gets incremented or cleared by sending a corresponding command to the printer.

**Note:** Note that this command may be used to monitor actual transaction completion, as it is synchronised with cut commands.

This means that if this command is sent immediately after a cut command, it won't be processed until the cut cycle is complete.

**US b – [MP]**  
**1F 62**  
**Request Ticket Number**

**Synopsis:** Request ticket number.

**ASCII** US b

**Hexadecimal** 1F 62

**Decimal** 31 98

**Return 3 bytes:** Command ID followed by the contents of Ticket Counter.

Byte 1 = 62h

Byte 2 = Ticket Counter (LSB).

Byte 3 = Ticket Counter (MSB).

**Range :** Dec: 0 ≤ Ticket Counter ≤ 65535

Hex: 0000 ≤ Ticket Counter ≤ FFFF

**Description:** Returns the contents of 16-bit Ticket Counter. See counter Code (1F 61 ...)

**US e n - [MP]**

**1F 65 n**

**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:  $0 \leq n \leq 255$

Hex:  $0 \leq n \leq FF$

**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.

**Example:** Checksum = - (0x1D + 0x2A + ...) For the "Define Downloaded Bit Image" command.

**US i n - [MP]**

**1F 69 n**

**Select Active User Defined Character**

**Synopsis:** Select active user defined character

**ASCII** US i n

**Hexadecimal** 1F 69 n

**Decimal** 31 105 n

**Operand n:** n = Select active User-font

**Default:** 0

**Limits:** Dec:  $0 \leq n \leq 255$

Hex:  $0 \leq n \leq FF$

**Description:** Selects the active user defined font used by commands 1B 26, 1F 26, 1B 25, 1B 3A, 1B 3F, 1F 6B.

**Note :** Setting remains unchanged until printer reboots, or command 1B 40 resets active user defined font to default.

**US j - [MP]**

**1F 6A**

**Upload Logo**

**Synopsis:** Upload logo in Microsoft BMP format.

**ASCII** US j

**Hexadecimal** 1F 6A

**Decimal** 31 106

**Description:** Upload current Logo in BMP format.

If current logo doesn't exist, the printer returns 3 byte string 6A 00 00

If current logo exists, the printer returns the byte 6A, followed by the logo description in Microsoft BMP format.

**Note :** Microsoft BMP bitmap file format.

See Also command "Select Current Logo" (1D 23) to change logo selection.

**US k - [MP]**

**1F 6B**

**Upload Font**

**Synopsis:** Upload font.

**ASCII** US k

**Hexadecimal** 1F 6B

**Decimal** 31 107

**Description:** Upload current Font/codepage in Easy-Font DAT format.

All printer fonts are accessible: Resident, user-defined, Easy font.

**Note :** Double byte fonts are not supported, for now at least.

**US t - [MP] [\*]**

**1F 74**

**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.

See also command (1F 0A 74 3D 44 reply on Com port).

**US v n - [MP]**

**1F 76 n**

**Buffered Status Transmission**

**Synopsis:** Buffered status transmission.

**ASCII** US v n

**Hexadecimal** 1F 76 n

**Decimal** 31 118 n

**Operand:** n = Reply status select

1 = Printer Status.

2 = Error Status.

3 = Sensor Status.

4 = Sensor Status n°2.

**Limit** Dec:  $0 \leq n \leq 4$

Hex:  $00 \leq n \leq 04$

**Return :** n Byte(s) See Table below.

**Description:** Returns the selected status when this command is processed as normal printer data.

<b>“US v” RETURNED STATUS DEFINITION</b>			
<b>n = 1: PRINTER STATUS</b>			
<b>Bit<sup>(1)</sup></b>	<b>Function</b>	<b>Value</b>	
		<b>0</b>	<b>1</b>
0	Reserved	-	-
1	Reserved	-	-
2	Reserved	-	-
3	Printer paper detector paper status	Present	Out
4	Fixed	Always 0	-
5	Reserved	-	-
6	Printer reset	Reported	Reset
7	Fixed	Always 0	-

<sup>(1)</sup> Unused, reserved or undefined bit(s) set to 0

<b>“US v” RETURNED STATUS DEFINITION</b>			
<b>n = 2: ERROR STATUS</b>			
<b>Bit<sup>(1)</sup></b>	<b>Function</b>	<b>Value</b>	
		<b>0</b>	<b>1</b>
0	Printer error status	Ok	Failure <sup>(2)</sup>
1	Reserved	-	-
2	Reserved	-	-
3	Printer door Status	Closed	Open
4	Fixed	Always 0	-
5	Reserved	-	-
6	Reserved	-	-
7	Fixed	Always 0	-

<sup>(1)</sup> Unused, reserved or undefined bit(s) set to 0

<sup>(2)</sup> Failure = All printer errors, except allocation error (warning Interpretation).

“US v” RETURNED STATUS DEFINITION n = 3: SENSOR STATUS			
Bit <sup>(1)</sup>	Function	Value	
		0	1
0	Printer door switch	Closed/Low	Open/High
1	Reserved	-	-
2	Reserved	-	-
3	undefined	-	-
4	Fixed	Always 0	-
5	Reserved	-	-
6	Printer paper sensor	Paper/Low	High
7	Fixed	Always 0	-

<sup>(1)</sup> Unused, reserved or undefined bit(s) set to 0.

“US v” RETURNED STATUS DEFINITION n = 4: SENSOR STATUS			
Bit <sup>(1)</sup>	Function	Value	
		0	1
0	Reserved	-	-
1	Reserved	-	-
2	Reserved	-	-
3	Reserved	-	-
4	Fixed	Always 0	-
5	undefined		
6	undefined		
7	Fixed	Always 0	-

<sup>(1)</sup> Unused, reserved or undefined bit(s) set to 0.

<b>US w n - [MP]</b>
<b>1F 77 n</b>
<b>Return Memory Allocation status</b>

**Synopsis:** Reply SRAM or flash memory allocation in user section.

**ASCII** US v n

**Hexadecimal** 1F 77 n

**Decimal** 31 119 n

**Operand:** n = Status select

**Return**

- 0 Reply the amount of SRAM memory available in for “user” section.
- 1 Reply the amount of Flash memory available in user download Logo/Font section.
- 2 Reply the amount of Flash memory available in user download Easy Font section.
- 3 Reply the amount of Flash memory available in user data section.

**Limit** Dec:  $0 \leq n \leq 3$

Hex:  $00 \leq n \leq 03$

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

**Note:** Returns the number of bytes available as a zero terminated ASCII string.

Each digit is coded in decimal.

For n=0, the returned value corresponds to the size of the biggest chunk of memory available, not the total amount of memory available.

**US y n - [MP]**

**1F 79 n**

**Set low Resolution Raster Graphics Status**

**Synopsis:** Select or cancel low resolution raster graphics status.

**ASCII** US y n

**Hexadecimal** 1F 79 n

**Decimal** 31 121 n

**Operand:**  
 n = Select resolution mode.  
 0 = Disabled. 8 dot/mm mode.  
 1 = Enabled. 4 dot/mm emulation mode.

**Default:** 0 (Disabled)

**Limit**  
 Dec:  $0 \leq n \leq 1$   
 Hex:  $00 \leq n \leq 01$

**Description:** Returns the selected status when this command is processed as normal printer data.

**Note:** Used in combination with command "Print Raster Graphics" (11 n1...dn).  
 When this mode is enabled, the number of data bytes of command "Print Raster Graphics" is divided by two. Each pixel is doubled in horizontal direction, and the raster is printed twice.  
 This mode can be used to emulate 4 dots/mm graphics.

**US z n - [MP]**

**1F 7A n**

**Return User Font Status**

**Synopsis:** Return user font status.

**ASCII** US z n

**Hexadecimal** 1F 7A n

**Decimal** 31 122 n

**Operand:** n = Select font status.

**Limit**  
 Dec:  $0 \leq n \leq 255$   
 Hex:  $00 \leq n \leq FF$

**Reply :** Always returns 2 Bytes : Command ID + Status of font n.

Id = Command 7A (hex)  
 Status = 0 if no character in this font is defined.  
 = 1 if at least one character in font n is defined.

**Description:** Returns the status of selected user font.

## 9. SRAM MEMORY ALLOCATION

A pool of SRAM memory is shared by different functions, and is allocated dynamically. The size of this pool depends on the SRAM chip fitted on the board.

With a 64kbytes SRAM chip (32KWords), the pool buffer size is 25 to 29 Kbytes (see command 1F 0A 52 3D n).

To avoid memory allocation errors and unexpected behaviour as a consequence, it is important to understand the allocation process.

The following functions use dynamically allocated memory in SRAM:

### **Right Side Character Spacing**

A 2560 bytes buffer for right side character spacing processing is allocated if right side spacing is not equal to 0.

### **Character Scaling**

A 7680 bytes buffer for character scaling processing is allocated if character width or height ratio defined with command (1D 21) is greater than 2.

### **Upside Down Printing**

A buffer is allocated to process upside down printing. Its size is variable and depends on character scaling height ratio, and font height.

If this ratio equals 1 and font height equals 24, the buffer size is 3840 bytes, but it can take up to 31040 bytes in worst case.

### **Logo download**

As soon as at least one logo is downloaded to either SRAM or FLASH memory, a 4096 bytes buffer is allocated to store information structures.

This buffer is freed:

- When processing command (1B 40), unless there is at least one logo stored in Flash memory.
- When processing command (1D 40 31) to erase user font / logos flash storage area, unless there is at least one logo stored in SRAM.

For each logo, a data buffer is allocated in SRAM. Its size corresponds to the logo bitmap size. If the logo is stored in FLASH, this buffer is freed after transfer to FLASH.

If the logo is SRAM, this buffer is freed when processing command (1B 40).

### **User fonts download**

As soon as at least one user font is downloaded to either SRAM or FLASH memory, a 1024 bytes buffer is allocated to store information structures.

This buffer is freed:

- When processing command (1B 40), unless there is at least one user defined character stored in Flash memory
- When processing command (1D 40 31) to erase user font / logos flash storage area, unless there is at least one user defined character stored in SRAM.

For each user font (collection of multiple characters) downloaded in either SRAM or FLASH memory, a 3584 bytes buffer is allocated to store information structures.

This buffer is freed:

- When processing command (1B 40), unless there is at least one user defined character stored in FLASH memory
- When processing command (1D 40 31) to erase user font / logos flash storage area, unless there is at least one user defined character stored in SRAM.

For each character stored in SRAM, a data buffer is allocated in SRAM.

Its size corresponds to the character bitmap size.

If the user character is stored in FLASH, this buffer is freed after transfer to FLASH.

If the user character is stored in SRAM, this buffer is freed when processing (1B 40) or (1B 3F) commands.

### **Page mode**

The page mode print data rendering is done in a buffer stored in SRAM.

Its size is: total page width x total page height

The buffer is allocated when entering page mode. Its size may be readjusted if necessary if the total height or width is increased by command “Set print area in page mode”.

The buffer is freed when leaving page mode

### **Barcode printing**

The barcode rendering is done in a buffer stored in SRAM. The buffer is freed once the barcode is printed. The buffer size corresponds to the barcode bitmap size, including HRI

### **Macro Definition**

The macro is stored in a 2048 bytes buffer. It is allocated when starting macro definition. It is freed if a macro definition is empty, or if an “execute macro command” is sent while recording the macro.

## Easyfont download

### Single byte fonts

A 3584 bytes buffer is allocated to store information structures.

This buffer is freed when processing command (1D 40 33) to erase Easy font storage area.

In addition, a temporary buffer is allocated when processing (1C 4C) command. It is freed at the end of the processing of this command

Its size is: 2 x character width in bytes x character height

## Summary

Function Name	Persistent storage	Temporary storage
Right side spacing	2560	-
Character scaling	7680	-
Upside down printing	-	Typically 3840, up to 31040
Flash Logo download	4096	2 x LogoWidthInWords x LogoHeight
SRam Logo download	4096 + 2 x LogoWidthInWords x LogoHeight	-
Flash User char download	1024 + 3584 per font	2 x NbChars x CharWidthInWords x CharHeight
SRam User char download	1024 + 3584 per font + 2 x NbChars x CharWidthInWords x CharHeight	-
Page mode	2 x PageWidthInWords x PageHeight	-
Barcode printing	-	2 x CodeWidthInWords x CodeHeight
Macro definition	2048	-
Easyfont single	3584 per font	2 x CharWidthInWords x CharHeight

(All sizes in bytes)

## 10. ERROR HANDLING

The printer has different behaviour when an error condition occurs, depending on how Fault recovery mode is configured.

### 10.1. Automatic Fault Recovery Mode

Condition	Internal status	Restart condition
Paper out	Error	Refill paper, open/close cover
Cover open	Error	Close cover
Temperature error	Error	Wait until temperature is in valid range
Voltage error	Error	Wait until voltage is in valid range
SRAM alloc error	Warning	Clear allocation error, send real time Command 10 19 09.
FLASH alloc error	Warning	Clear allocation error, send real time Command 10 19 09.

When an error is detected, following actions take place:

- \* On USB interface all datas received on BULK OUT will continue to be stored in receive buffer until it is full. From then on, all subsequent datas will be lost.  
To avoid this situation make sure to monitor status either with real time commands or USM automatic status.
- \* Status reported by status commands is updated within a few milliseconds.

Once all errors conditions are cleared, following actions take place:

- \* On USB interface all new datas received on BULK OUT are stored normally in receive buffer.
- \* Batch commands processing restarts from where it stopped in the receive buffer, although 1 or 2 lines of text that were leftover in print buffer may be lost.
- \* Status reported by status commands is updated within a few milliseconds

## 10.2. Host Controlled Fault Recovery Mode

Condition	Internal status	Restart condition
Paper out	Error	Refill paper, open/close cover and send real time command (10 05 02)
Paper low	Warning	N/A
Cover open	Error	Close cover and send real time command (10 05 02)
Temperature error	Error	Wait until temperature is in valid range
Voltage error	Error	Wait until voltage is in valid range
Knife error	Error	N/A
Ejector error	Error	N/A
TOF error	Error	N/A
SRAM alloc error	Warning	Clear allocation error; send real time command 10 19 09. And send real time command (10 05 02).
FLASH alloc error	Warning	Clear allocation error; send real time command 10 19 09. And send real time command (10 05 02).

When an error is detected, following actions take place:

- \* On USB interface all datas received on BULK OUT will continue to be stored in receive buffer until it is full. From then on, all subsequent datas will be lost.
- To avoid this situation make sure to monitor status either with real time commands or USM automatic status
- \* Batch commands processing is blocked immediately. Real time commands processing remains active
- \* Status reported by status commands is updated within a few milliseconds

Once all errors conditions are cleared, following actions take place:

- \* On USB interface all new datas received on BULK OUT are stored normally in receive buffer.
- \* After processing real time command (10 05 02), receive and print buffers are cleared
- \* Batch commands processing restarts.
- \* Status reported by status commands is updated within a few milliseconds

## 11. 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 a service representative.

### 11.1.LED

Problem	Possible Causes	What to Do
LED, slow continuous flashing.	- Paper out.	Put in a new paper roll.
	- Cover off	Put the cover on.
	- Printhead too hot	Wait until temperature is in valid range
	- Voltages out of range	Wait until Voltage is in valid range
	- Memory allocation error	Clear error with real time command (10 19 09).
Flashes LED in various combinations.	These all indicate serious problems.	Contact your authorized service representative.
Double LED Flash	- SRAM Test Failure	Contact your authorized service representative.
Triple LED Flash	- EEPROM Test Failure	Contact your authorized service representative.
Continuous flashing of LED	- Main Program CRC Test Failure	Contact your authorized service representative. (Indicating Boot Mode)

## **11.2. Printing Problems**

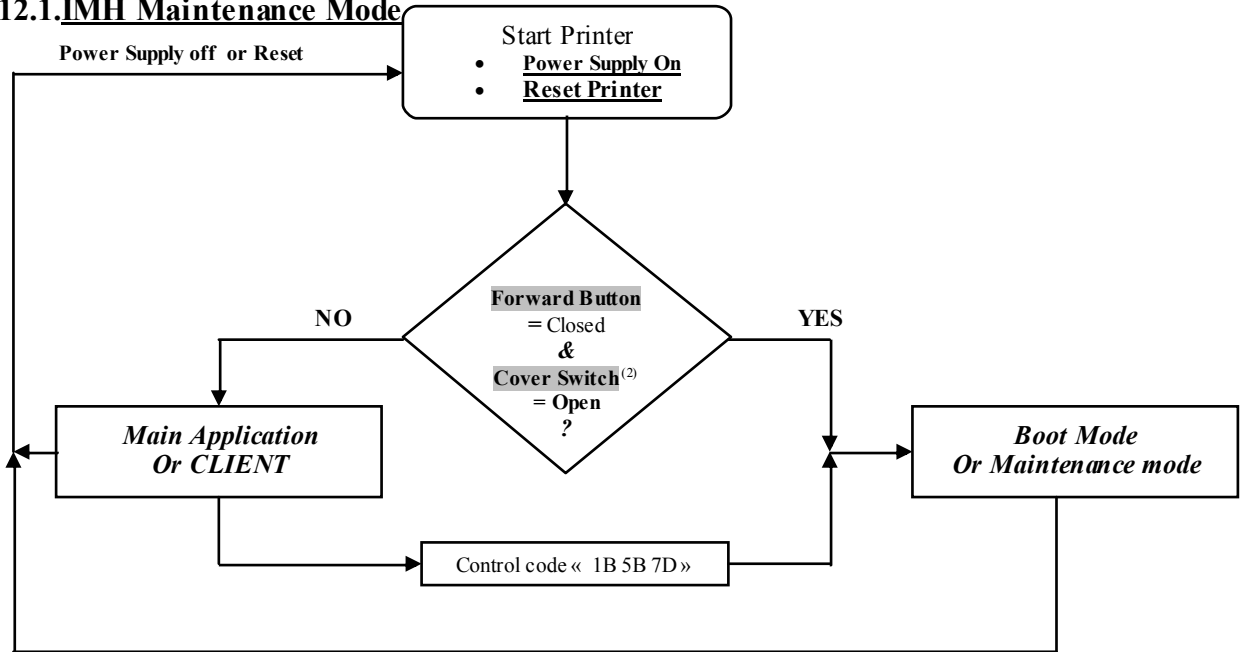
<b>Problem</b>	<b>Possible Causes</b>	<b>What to Do</b>
Colored stripe on the receipt.	Paper is low.	Change the paper.
Receipt does not come out all the way.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.
Printer starts to print, but stops while the receipt is being printed.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.
Receipt is not cut.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.
	The printer is not configured for a knife.	Contact your authorized service representative.
Print is light or spotty.	Test with another font.	Test same ticket in bold print.
	Paper roll loaded incorrectly.	Check that the paper is loaded properly.
	Thermal printhead is dirty.	Use recommended thermal receipt paper.
	Variations in paper.	Increase print density in “Set Hardware 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.	Contact your authorized service representative.

## **11.3. Printer Does Not Function**

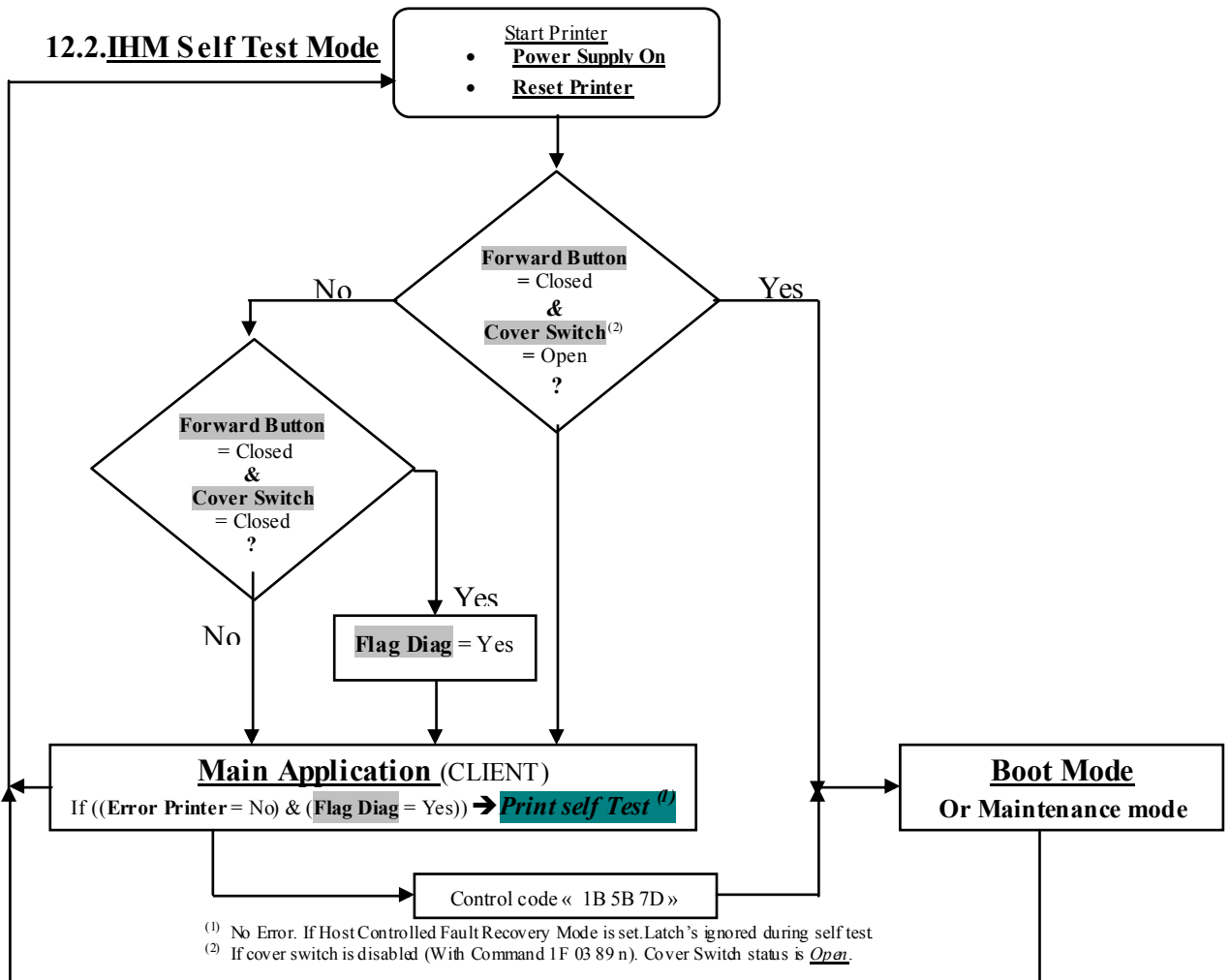
<b>Problem</b>	<b>Possible Causes</b>	<b>What to Do</b>
Printer does not function when turned on.	Printer not plugged in.	Check that printer cables are properly connected on both ends.
		Check that the host or power supply is getting power.
	Receipt cover not fully closed.	Close and latch the receipt cover.

## 12. SPECIFIC FIRMWARE DEFINITIONS

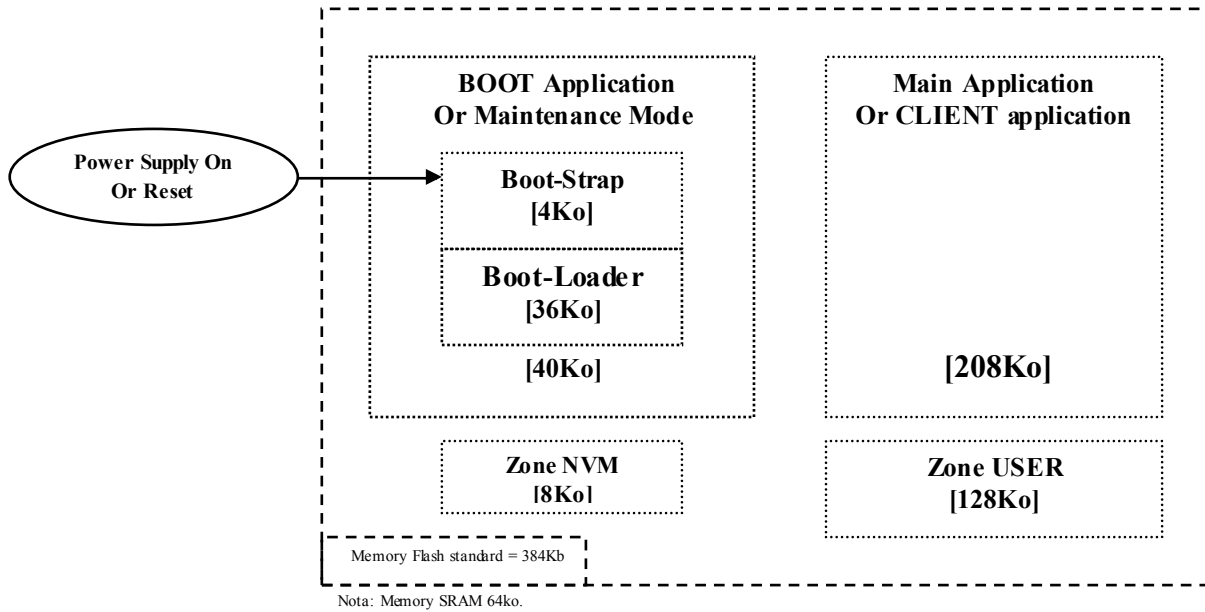
### 12.1. IHM Maintenance Mode



### 12.2. IHM Self Test Mode



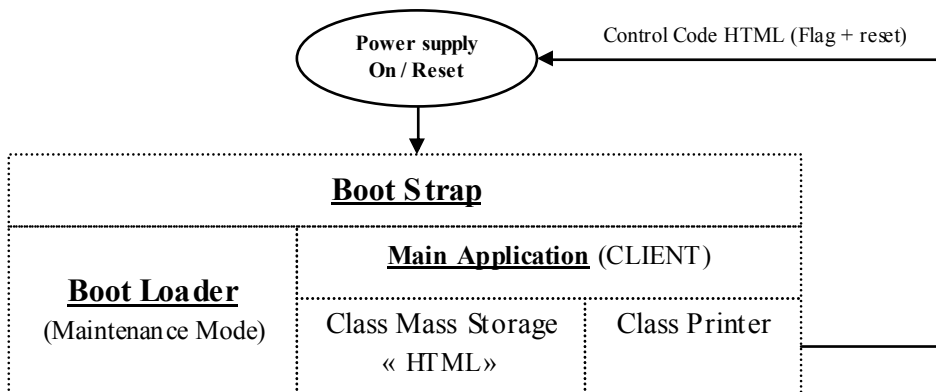
### 12.3. Firmware Description



<b>Boot-Strap</b>	Check integrity of <i>Main Application</i> program and <i>Boot-Loader</i> program. Branch to the <i>Main Application</i> program if OK else branch to the <i>Boot Loader</i> program. If <i>Main Application</i> and <i>Boot Loader</i> program NOK, enter in <i>Security Download Mode</i> . <i>Security Download Mode</i> available also with a jumper on electronics-Board.
<b>Boot-Loader</b>	Update version (flash Erase, flash download) for <i>Main application</i> (*.bin file), <i>Boot-Loader</i> (*.pbt file) and <i>Boot Strap</i> (*.pbt file) programs.
<b>Zone NVM</b>	No volatile memory. Flash memory to emulate the Eeprom.
<b>Main Application</b>	Printer application.
<b>Zone USER</b>	Fonts/logos, data storage users, Easy Fonts simple.

### 12.4. HTML Mode (Option “Demonstration Mode”)

- Default DEVICE Mode : <USB PRINTER>
- <USB PRINTER> → <USB Mass Storage HTML>: Using control Code.
- <USB Mass Storage HTML> → <USB PRINTER>: **PC Disconnected Device or Switch sequence or Power Off TBD**



## 13. GLOSSARY – ABBREVIATION

- NVM: Non-Volatile Memorie (EPROM).
- TBC: To Be Confirmed.
- TBD: To Be Defined.
- ASB: Automatic Status Back.
- USM: Unsolicited Status Mode.
- BP: Boot Program.
- MP: Main Program.
- DBG: Debug Command.
- LSB: Least significant Bit.
- MSB: Most Significant Bit.
- N/A Not Applicable.
- A/D Analog to Digital.