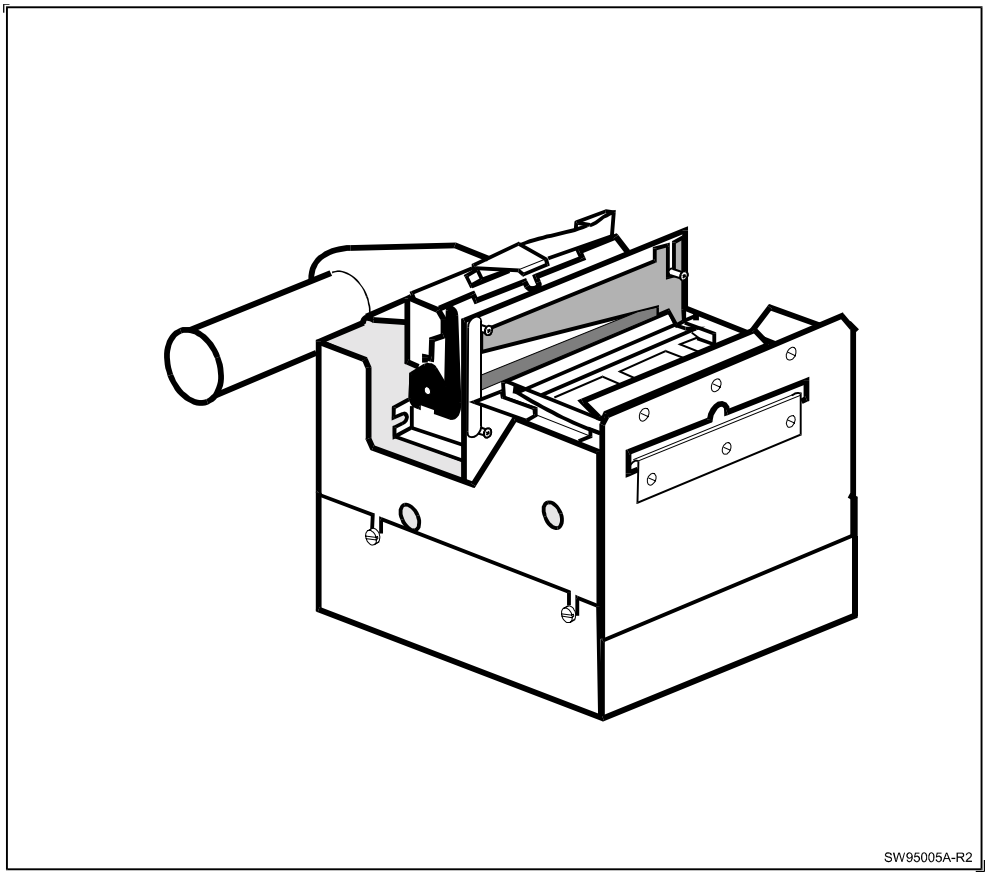
TTP 5200/5250 Kiosk Printer Sub-system

Installation Manual



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Related manuals

- ***TTP 5000 Series Kiosk Printer Sub-system, Service Manual*** *– Part. No. 00803-000*
- ***TTP 5100/5200/5250 Kiosk Printer Sub-system, Operating Instructions*** *– Part. No. 01434-000*
- ***TTP 5200/5250 Evaluation Kit — Getting Started*** *– Part. No. 01451-000*
- ***TTP 5200/5250 Installation Manual*** *– Part. No. 01436-000*
- ***TTP 5200/5250 Kiosk Printer Sub-system, Technical Specification*** *– Part No. 01441-000*

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REVISION HISTORY

Edition A, major changes

- Command ESC C n1 n2 (Set page length, portrait mode) Illustration corrected.
- Command ESC a n1 n2 (Set page width, landscape mode): Illustration corrected.

Edition B, major changes

- Command ESC a n1 n2 (Set page width, landscape mode): Example added.
- Command ESC C n1 n2 (Set page length, portrait mode): Parameter value corrected.
- Statu request commands ESC ENQ 1 — ESC ENQ 8: Information added regarding communications interface required for used of each command, etc.
- Command ESC W (Windows mode ON/OFF): Description added.
- Command ESC M n1 n2 (Top of form definition): Descripton changed.
- Section 5.2, *Description of default parameters* rewritten. List of default parameters changed.
- Section 5.4, *Firmware loading* rewritten.
- Chapter 13, *Basic character set*: Non printable characters added.
- Chapter 15, *Firmware history* added.

Edition C, major changes

- New address to Swecoin AB.

Edition D, major changes

- Section 9, New order No. for serial interface adapter with pins 4 and 7 interconnected
- Corrected description of command ESC & 4

1 INTRODUCTION

1.1 About this manual

This manual contains the information required for installation and operation of the TTP 5200 and 5250 printers from a host computer such as a PC.

***NOTE**! — The manual also applies to the TTP 5100 printer with the exception of information regarding on-line downloading of firmware, default parameters, character font sets, and logotypes. Software commands that cannot be used with the TTP 5100 are marked ~~TTP 5100~~ in the list in Chapter **3,** page 7 .*

1.2 Updating

This manual will be updated as, from time to time, printer functions and features may be added or amended. You will always find the latest edition on our web site (http://www.swecoin.se). You can order printed copies of the current manual edition by e-mail, fax or phone.

Registered manual owners will be kept informed about new editions, product changes, etc. through our fax bulletin service. To register as a manual owner, either fill in the form at the end of the manual or fill in the requested information when you visit the Technical Support section on our web site to download a manual.

If you require functions not found in the manual edition at your disposal, you are welcome to consult one of our offices for information.

2 PRODUCT PRESENTATION

2.1 Printer exterior

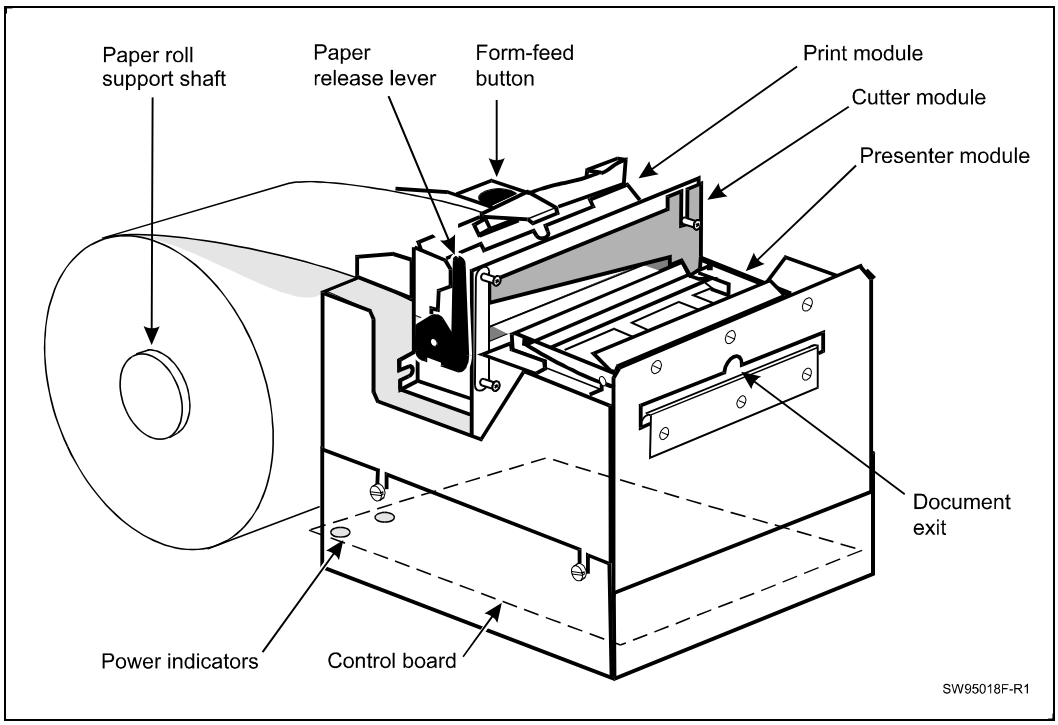


Figure 1. Printer exterior

2.2 Differences between TTP 5200/5250 and TTP 5000/TTP 5100

The main differences between the TTP 52xx and the previous TTP 5000 and TTP 5100 models are

- the type of memory component used for storing the firmware on the control board. The EPROM used in the TTP 5000 and TTP 5100 models is replaced with a flash PROM that permits downloading of firmware, default parameters, up to 8 character font sets, and logotypes.
- the page buffer memory that now allows landscape printing up to 210 mm page length (in paper feed direction).

The TTP 52xx models are backward compatible with the TTP 5000 and TTP 5100 with one exception (see command ESC ! n, on page 12).

3 SUMMARY OF CONTROL CODES & ESCAPE SEQUENCES

COMMANDS NOT TO BE USED!

The printer uses the following commands for internal house-keeping purposes.
These commands must not be used for application programming.

ESC 4BH
ESC 57H
ESC ENQ FEH
ESC ECQ FFH

Commands marked ~~TTP 5100~~ cannot be used with the TTP 5100.

3.1 Character and bit-image graphics mode commands

Code	Hex	Decimal*	Function	Page	Remark
HT	09	9	Horizontal tabulation	10	
LF	0A	10	Line feed	10	
CR	0D	13	Carriage return	10	
FF	0C	12	Form feed	11	
RS	1E	30	Cut and eject paper	11	
SI	0F	15	Reset from double-width print mode	11	
SO	0E	14	Set double-width print mode	11	
ENQ	05	5	Clear presenter	12	
CAN	18	24	Cancel	12	
ESC NUL	1B 00	27 0	Load firmware	46	~~TTP 5100~~
ESC ! n	1B 21 n	27 33	Select character set and character parameters	12	Limited function in TTP 5100
ESC & NUL	1B 26 00	27 38 0	Download character set	14	~~TTP 5100~~
ESC & 1	1B 26 01	27 38 1	Download user defined logotype	14	~~TTP 5100~~
ESC & 2 n1...41	1B 26 02 n1...n41	27 38 2 n1...n41	Download temporary default parameters	14	~~TTP 5100~~
ESC & 4	1B 26 04	27 38 4	Store current parameter values in flash PROM	14	~~TTP 5100~~
ESC & 6	1B 26 06	27 38 6	Ducumets printed after paper low sensor signalls before printing stops		**FW 2.60 and above**
ESC & C	1B 26 43	27 38 67	Erase all character sets	15	~~TTP 5100~~
ESC & D	1B 26 44	27 38 68	Erase character sets 4—7	15	~~TTP 5100~~

Code	Hex	Decimal*	Function	Page	Remark
ESC & L	1B 26 4C	27 38 76	Erase all downloaded logotypes	15	~~TTP 5100~~
ESC 3 n	1B 33 n	27 51	Set line spacing	16	
ESC ?	1B 3F	27 63	Reset (full)	16	
ESC @	1B 40	27 64	Reset (partial)	16	
ESC a n1 n2	1B 61 n1 n2	27 97 n1 n2	Set page width, landscape mode	17	
ESC C n1 n2	1B 43 n1n2	27 67 n1 n2	Set page length, portrait mode	18	
ESC c n	1B 63 n	27 99 n	Variable document length ON/OFF	18	
ESC d n	1B 64 n	27 100 n	Execute n line feeds	19	
ESC ENQ 1	1B 05 01	27 5 1	Status enquiry	19	
ESC ENQ 2	1B 05 2	27 5 2	Status enquiry, paper near end	19	
ESC ENQ 3	1B 05 03	27 5 3	Parameter setting data enquiry	20	
ESC ENQ 4	1B 05 04	27 5 4	Character sets and logotype enquiry	20	
ESC ENQ 5	1B 05 05	27 5 5	Paper near end enquiry	20	
ESC ENQ 6	1B 05 06	27 5 6	Status inquiry	20	
ESC ENQ 7	1B 05 07	27 5 7	Program version enquiry	21	
ESC ENQ 8	1B 05 08	27 5 8	Presenter clear enquiry	21	
ESC F n1..nx NUL	1B 46 n1...nx 00	27 70 n...nx 0	Set horizontal tabs	21	
ESC f n	1B 66 n	27 102 n	Presenter function	21	
ESC FF n	1B 0C n	27 12 n	Eject only	22	
ESC g n1 … n5	1B 67	27 103	Print logotype	22	
ESC h n	1B 68 n	27 104 n	Set multiple-height print mode	23	
ESC J n	1B 4A n	27 74 n	Paper advance	23	
ESC j n	1B 6A n	27 106 n	Paper reverse	23	
ESC O n1 n2	1B 4F n1 n2	27 64 n1 n2	Absolute line positioning	24	
ESC q n	1B 71 n	27 113 n	Burn time adjustment	24	
ESC R n	1B 52 n	27 82 n	Select national character set	24	
ESC RS	1B 1E	27 30	Cut paper (no eject)	25	
ESC S n1 n2	1B 53 n1n2	27 83 n1 n2	Select graphics mode	25	
ESC SI	1B 0F	27 15	Reset from double-height print mode	25	
ESC SO	1B 0E	27 14	Set double-height print mode	26	
ESC T n	1B 54 n	27 84 n	Reversed print mode on/off	26	
ESC W	1B 57	27 87	Windows mode on/off	27	

*) Always enter three digits for each decimal number.

Example: 27 38 0 should be entered as **0**27 **0**38 **00**0

3.2 Label and other top-of-form oriented commands

Code	Hex	Decimal	Function	Page
ESC A n1n2n3	1B 41 n1n2n3	27 65 n1n2n3	Set label (block) length	28
ESC BC b1	1B 42 43 b11	27 66 67 b1	Clear bar code field	28
ESC BS b1...b11	1B 42 53 b1...b11	27 66 83 b1...b11	Reserve bar code field	29
ESC BW b1...NUL	1B 42 57 b1...00	27 66 87 b1...0	State bar code data	30
ESC DC d1	1B 44 43 d1	27 68 67 d1	Clear comment field	31
ESC DS d1...d7	1B 48 53 d1...d7	27 68 83 d1...d7	Reserve comment field	31
ESC DW d1...NUL	1B 48 57 d1...00	27 68 87 d1...0	State comment field data	33
ESC E	1B 45	27 69	Clear all label fields	33
ESC GC g1	1B 47 43 g1	27 71 67 g1	Clear graphics field	33
ESC GS g1...g8	1B 47 53 g1...g8	27 71 83 g1...g8	Reserve graphics field	34
ESC GW g1...gn	1B 47 57 g1...gn	27 71 87 g1...gn	State graphics data	35
ESC LC l1	1B 4C 43 l1	27 76 67 l1	Clear ruler line area	35
ESC LS l1...l10	1B 4C 53 l1...l10	27 76 83 l1...l10	Set ruler line data	35
ESC M n1 n2	1B 4D n1n2	27 77 n1 n2	Top-of-form definition	37
ESC P n1	1B 50 n1	27 80 n1	Print label (block)	37
ESC X n1 n2	1B 58 n1 n2	27 88 n1 n2	Sense TOF position	37
ESC x n1 n2	1B 78 n1 n2	27 120 n1 n2	Set internal TOF counter	38
ESC Y n1 n2	1B 59 n1 n2	27 89 n1 n2	Set print start position	38
ESC Z	1B 5A	27 90	Go to next top of form	38

NOTE 1 — *Incomplete commands received by the printer (example ”ESC+&”) will place the printer in a waiting mode. Power OFF/ON is required to reset the printer into operating mode again.*

NOTE 2 — *Invalid commands (1 byte or multiple bytes) sent to the printer will be ignored or printed in ASCII representation. Invalid commands are any commands not listed in Chapter 3 of this document.*

4 SOFTWARE COMMAND SYNTAX

4.1 Character- and bit-image graphics commands

HT	Horizontal Tabulation

(09H), ***(9) decimal***

Shifts the current print position to the next character Tab position.

Refer to the ESC + F +n1....nx command on page 21.

LF	Line Feed

(0AH), ***(10) decimal***

Prints the data in the input buffer in the current character mode (such as double height and double width) and adds a line space as specified by the line spacing setting (see command ESC + 3 n on page 16). Print position is returned to the beginning of the line. This command is ignored if immediately preceded by CR.

CR	Carriage Return

(0DH), ***(13) decimal***

Alternative functions:

- Returns print position to beginning of line without print or line feed.
- Prints the data in the input buffer in the current character mode. Inserts line spaces as specified by the line spacing setting (see command ESC + 3 + n on page 16). Print position is returned to beginning of the line.

Refer to Section 5.3 for selection between the alternative functions.

FF	Form Feed

(0CH), ***(12) decimal***

Prints data from the input buffer and feeds the paper to the top of the next page.

The FF command default value is as defined in the Start-up Parameter setting, n14, n15 and/or n37.

In Landscape mode (ESC+!+n, bit 3 = 1), print is effected by the FF command.

In TOF mode, the printer interprets incoming FF commands as ESC + X + 08 + 00

If Autocut is set = 1 , FF effects Form Feed, Cut and Eject.

Note! *— Use ESC C n1 n2 to define arbitrarily selected page length.*

RS	Cut and eject paper

(1EH), ***(30) decimal***

Effects paper cut-off and default length eject via the presenter module.

If already executed paper feed is shorter than 75 mm, additional paper feed up to the minimum 75 mm is effected before execution of the Cut command.

SI	Reset from double-width print mode

(0FH), ***(15) decimal***

Resets from double-width mode printing, set by SO, to default character mode. Valid in double-width mode only.

SO	Set double-width print mode

(0EH), ***(14) decimal***

Sets double character-width mode. The characters are printed in double width of the selected font set.

Normal-width and double-width characters can be combined on the same print line.

Double-width mode can be combined with double-height mode for printing of "Quadruple" characters.

ENQ	Clear presenter

(05H), ***(5) decimal***

Used to clear the paper path in the presenter module, for example, to fully eject a document that was not removed after previous print, cut, and eject operation. Partly printed documents will be cut and ejected.

Unsuccessful execution of this command (presenter sensor still detects paper in the presenter) results in the printer setting bit 1 of the status response byte 2, to a ”1”.

If the serial printer interface is used, the status response is automatically returned to the host if ACK/NAK handshaking is selected (see Section 5.3). The status is also returned in response to the status enquiry command ESC ENQ 6.

CAN	Cancel

(18H), ***(24) decimal***

Cancels print data on the same line as the CAN command. ESC commands issued on the same line as the CAN command are not cancelled.

ESC + ! + n	Select character set and character parameters

(1BH)+(21H)+n, ***(27)+(33)+n decimal***

This command sets and/or removes a selection of character-related parameters.

Bits 3—7 apply to all character sets. Character set No. 0 is the basic (default) set.

NOTE! *— See next page regarding incompatibility with TTP 5100 printers.*

Bits of n	Value	Function	Bits of n	Value	Function
0, 1, 2	0	Character set 0	4	0	Double height OFF
	1	Character set 1		1	Double height ON
	2	Character set 2	5	0	Reversed print OFF
	3	Character set 3		1	Reversed print ON
	4	Character set 4	6	0	Double width OFF
	5	Character set 5		1	Double width ON
	6	Character set 6	7	0	Underline OFF
	7	Character set 7		1	Underline ON
3	0	Landscape mode OFF			
	1	Landscape mode ON			

Example:
A print line using character set No. 2, printing in landscape mode, and with double

character width, requires the command **ESC + ! + 74**.

Bit No.	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Bit value	128	64	32	16	8	4	2	1
Example	0	**1**	0	0	**1**	0	**1**	0

64 + **8** + **2** = **74**

Lines, too long to be printed in the selected font, are automatically wrapped around.

Different character sets can be used on the same line.

Parameter set by bits 3 and 4 cannot be changed on the current print line but can be changed from line to line.

Selection of an erased, or for other reasons non-existent, character set will set bit 1 of byte 2 in the status enquiry response to ”1” , see Chapter 6.2.

For definition of landscape and portrait page formats, refer to page 17 and 18.

NOTE! *— Printout in landscape mode is effected with the FF command.*

NOTE! *— If more than 240 characters are sent to the printer before an LF, an automatic print-out of the first part of the line buffer contents is effected. This print-out is made with the character parameter status as known to the printer at the time.*

Backward incompatibility between TTP 52xx and TTP 5100.

Command ESC + ! + n has been modified in the TTP 52xx printers to simplify selection of character sets.

The following table lists the differences.

TTP 52x0 from FW version 1.01 and TTP 5100 from version 2.0		**TTP 5100 up to FW version 1.94**	
Bit	**Function**	**Bit**	**Function**
0	Select character set	0	Select character set
1	Select character set	1	Select character set
2	Select character set	2	Landscape mode on/off
3	Landscape mode on/off	3	Double height on/off
4	Double height on/off	4	Reversed print on/off
5	Reversed print on/off	5	Double width on/off
6	Double width on/off	6	Not used
7	Underline on/off	7	Underline on/off

NOTE! *— There are certain limitations when printing in landscape mode (bit 3 = 1). In this mode only text and logotypes can be printed after the ESC ! n command (bit 3=1). For printing graphics in this mode, the *.bmp file has to be rotated before it is sent to the printer. Bar code cannot be printed in landscape mode after the ESC ! command (bit 3=1). However, any page contents (also graphics and bar codes) can be printed in landscape mode under Windows or Windows based programs.*

ESC + & + NUL	Download character set

(1BH)+(26H)+(00H) ..., *(27)+(38)+(0) decimal*

This command is used to download a character set. The character set is placed in the first free address position in the order of download sequence.

A downloadable character set consists of a header containing data describing the set as well as data for each individual character in the set.

For complete specification of user-defined character set, see page 39.

NOTE! *— Within the 64 Kbyte printer buffer capacity available for font download, maximum 8 character sets can be addressed. Exceeding any of these limits will cause this command to fail.*

ESC + & + 1	Download user defined logotype

(1BH)+(26H)+(01H)..., *(27)+(38)+(1) decimal*

Downloads a user-defined logotype. The logotype is printed with the ESC g command, see page 22. Also see page 41 for a complete specification of user-defined logotypes.

ESC+&+2+n1...n41	Download temporary default parameters

(1BH)+(26H)+(02H)+n1...n41, *(27)+(38)+(2)+n1...n41 decimal*

A number of bytes, currently 41, in the flash PROM hold various parameter values called *default parameters*. One or several of them can be overridden temporarily with this command. All 41 bytes have to be sent, even if only some of the parameter values need to be modified. The permanently stored parameters will be used again after a printer reset command or at power ON.

The temporary values can, however, be stored in the flash PROM as permanent values with command ECS + & + 4.

Also see Section 5.3 on page 43.

ESC + & + 4	Store current parameter values in flash PROM

(1BH)+(26H)+(04H), *(27)+(38)+(4) decimal*

Stores all parameter values, currently in use in the printer, as permanent default parameter values in the flash PROM. This takes approximately 15 seconds. The printer then resets automatically and activates the presenter motor temporarily.

For complete specification, see Section 5.3 on page 43.

ESC + & + 6	Ducumets printed after paper low

(1BH)+(26H)+(06H), *(27)+(38)+(6) decimal*

Limits the number of ducumets that can be printed after the paper low sensor signalls. The range is 1 to 255. 0 disables the limitation. This function is used when you want to be abrolutely sure that the paper lasts for a full receipt, or if you want to stop printing when the paer is not as bent as it is at the very end of the roll.[1]

ESC + & + C	Erase all character sets

(1BH)+(26H)+(43H), *(27)+(38)+(67) decimal*

Erases all character sets stored in the flash PROM.

***NOTE!** — This command is only executed if all these conditions are met:*

- *At least one character set has been loaded*
- *Status inquiry response byte 1, bit 6, "Power has been OFF" is set to "1"*
- *No ESC + ENQ + 6 command has been received*

ESC + & + D	Erase character sets (4—7)

(1BH)+(26H+(44H), *(27)+(38)+(68) decimal*

Erases downloaded character sets 4—7. Default character sets 0—3 are not affected by this command.

The operation is complete when the printer resets automatically and activates the presenter motor temporarily. Takes approximately 15 seconds.

For complete specification, see page 39.

ESC + & + L	Erase all downloaded logotypes

(1BH)+(26H)+(4CH) , *(27)+(38)+(76) decimal*

This command erases all downloaded logotypes from the flash PROM.

The operation is complete when the printer resets automatically and activates the presenter motor temporarily. Takes approximately 15 seconds.

Erasing a logotype is a two-step operation: 1. Erase all logotypes. 2. Download the desired logotype(s) again.

For complete specification, see page 41.

[1] Added to firmware version 2.60

ESC + 3 + n	Set line spacing

(1BH)+(33H)+n, ***(27)+(51)+n decimal***

The default line spacing is directly related to the size of the selected font. Examples:

10 cpi	30 pixels = 3.75 mm
12 cpi	24 pixels = 3.0 mm
15 cpi	20 pixels = 2.5 mm
17 cpi	18 pixels = 2.25 mm
25 cpi	12 pixels = 1.5 mm

This command is used to increase the line spacing. The entered value n is the absolute line spacing expressed as a number of pixel lines (0.125 mm increment). To increase the line spacing to 5 mm, for example, enter value n = 40 (*5 / 0.125 = 40*).

The command is ignored if value ”n” is less than the default line spacing of the selected font.

ESC+ ?	Reset, full

(1BH)+(3FH), ***(27)+(63) decimal***

Full reset. Terminates processing and initialises the control board, resetting it to the default values used as at power ON (or as modified before the reset). The operation is complete when the printer resets automatically and activates the presenter motor temporarily.

All data stored in flash PROM such as firmware, parameters, downloaded fonts and logotypes, remain unchanged.

ESC+ @	Reset (partial)

(1BH)+(40H), (27)+(64) ***decimal***

Partial reset. All parameters, downloaded fonts and logotypes are restored to default values. Print line buffer is erased. The communications (FIFO) buffer is not erased.

ESC+a+n1+n2	Set page width (landscape mode)

(1BH)+(61H)+n1+n2, ***(27)+(97)+n1+n2 decimal***

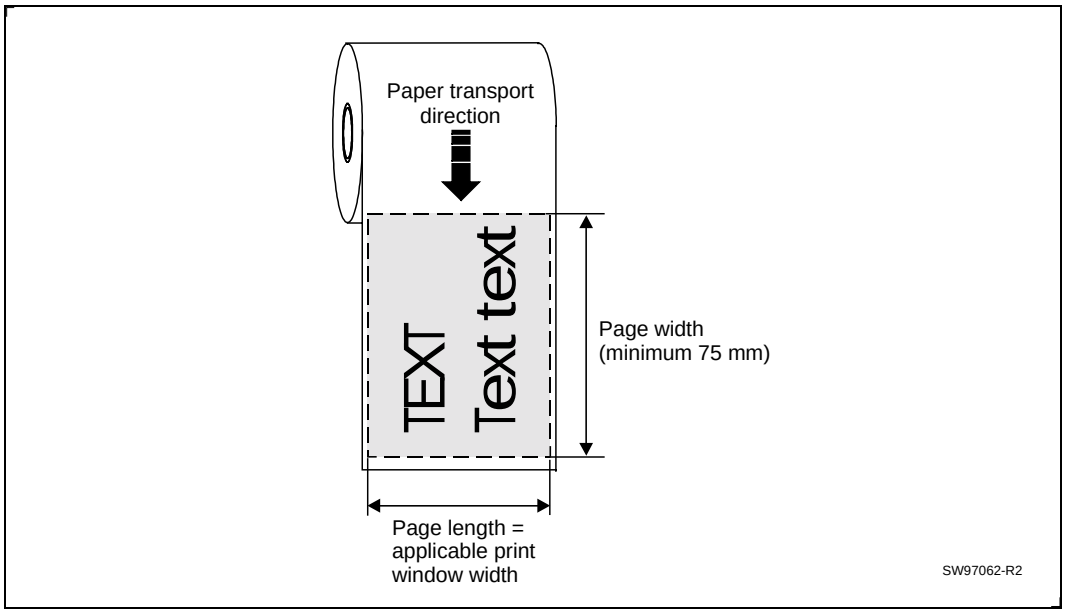


Figure 2. Definition of page length in landscape mode

The command sets the page width, expressed as a number of 0.125 mm pixel line feeds. The command has to be applied in character print mode. Form feed is effected with the FF command.

NOTE! *— Do not use page widths less than 75 mm (n1=2, n2=88). n1 is the higher order and n2 the lower order byte.*

- n1 and n2 must be 1-byte hexadecimal or decimal numbers.
- If the text exceeds the specified page width, an automatic form feed will be performed. For text fields that do not fill the specified page width, an FF command shall precede the Cut command. If the auto-cut function has been selected, however, the FF command automatically generates a Cut command (see page 43 regarding default parameter set-up).
- In landscape print mode, the printer's page buffer limits the page width setting to 220 mm (n1 = 6, n2 = 224). Default setting is n1 = 6, n2 = 144, equal to 210 mm (DIN A4 width). See Section 5.3, page 43, regarding setting of default parameters n40 and n41.

Example:
Desired page width = 90 mm. Value to be entered: 90 / 0.125 = 720. n1 = 2, n2 = 208

	n1		n2							
	512	256	128	64	32	16	8	4	2	1
	2^9	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
	1	0	1	1	0	1	0	0	0	0

ESC+C+n1+n2	Set page length (portrait mode)

(1BH)+(43H)+n1+n2, ***(27)+(67)+n1+n2 decimal***

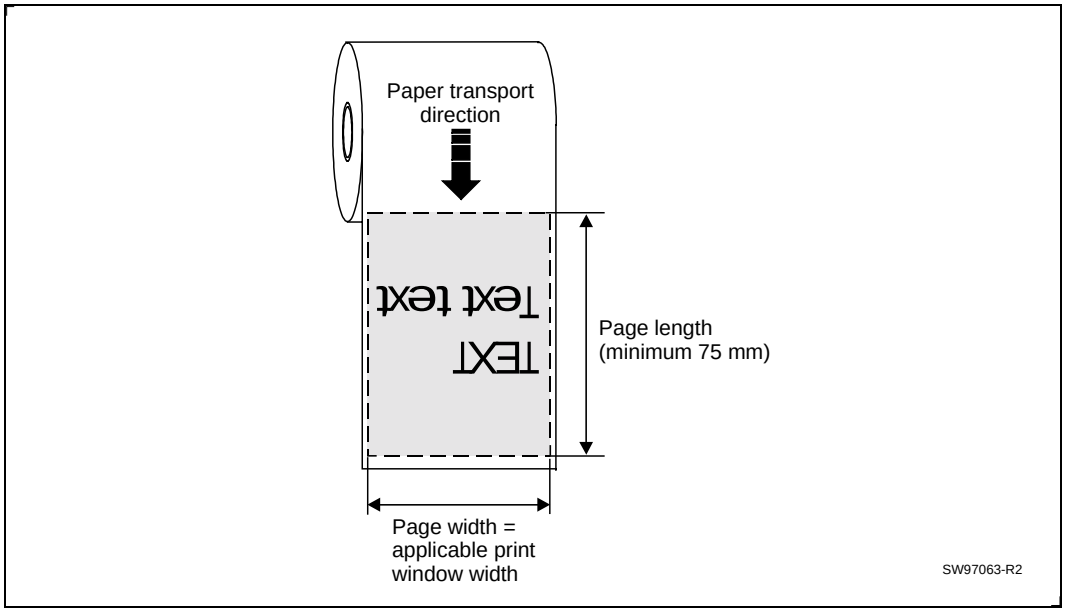


Figure 3. Definition of page length in portrait mode

Sets the page length expressed as a number of 0.125 mm pixel line feeds. The command shall be applied in character print mode. Form feed is effected with the FF command.

NOTE! *— Do not use page lengths less than 75 mm (n1 = 2, n2 = 88)*

- In portrait print mode there is no page length limitation, but the ESC + C + n1 + n2 setting applies unless superseded by command ESC + c + n that enables the variable document length.
- Page length settings, shorter than the minimum page length as defined by default parameter bytes n34 and n35 (see page 43), will automatically be adjusted to the default value.

ESC + c + n	Variable document length ON /OFF

(1BH)+(63H)+n, ***(27)+(99)+n decimal***

n = 0	Automatic form feed if the printed page length exceeds the length set by ESC + C + n1 + n2
n = 3 or higher	Selects continuous print mode (no auto FF). Also refer to Section 5.3, page 43, regarding default parameter n37.

ESC+d+n	Execute n line feeds

(1BH)+(64H)+n, ***(27)+(100)+n decimal***

Executes the number of line feeds as defined by variable n. The length of each line feed is determined by

- the default value for selected character font (see page 16) or
- the line setting effected by command ESC 3 n, (n = ”0” gives no line feed)

The print position is returned to the beginning of the line.

ESC + ENQ + 1	**Status enquiry** (except paper near end)

(1BH)+(05H)+(01H), ***(27)+(5)+(1) decimal***

This command can be used with all TTP 5xxx models if

- connected through the **serial** interface
- ACK/NAK handshaking is selected. See default parameter n9 in Section 5.3, page 43.

The command results in response ACK if no sensor is actuated, that is, if they are all in normal operation state (paper loaded, no paper-end condition, printhead not lifted, no paper under presenter sensor, cutter in home position).

The command results in NAK + code if one or more sensors have changed from normal operation state as defined above. Se page 48 for a list of responses to this command.

For status of the paper-near-end sensor, see command ESC + ENQ + 2 below.

ESC + ENQ + 2	**Status enquiry, paper near end**

(1BH)+(05H)+(02H), ***(27)+(5)+(2) decimal***

This command can be used with all TTP 5xxx models if connected through the **serial** interface.

The command requests a paper-near-end sensor (paper low) status from the printer in a 1-byte format as follows:

Value = (00H) indicates ”No paper”

Value = (01H) indicates ”Paper present” at the sensor position

ESC + ENQ + 3	Parameter setting data enquiry

(1BH)+(05H)+(03H), ***(27)+(5)+(3) decimal***

This command can be used with all TTP 5xxx models connected through the **serial** interface.

Requests 41 bytes of information about the current parameter settings, that is, the default parameters stored in flash PROM (see Section 5.3 on page 43) or any parameter value temporarily set by other ESC commands/.

ESC + ENQ + 4	Character sets and logotype enquiry

(1BH)+(+5H)+(04H), ***(27)+(5)+(4) decimal***

This command can be used with all TTP 5xxx models connected through the **serial** interface.

Requests multiple bytes of information regarding downloaded character sets and logotypes. The response is a list of character sets and logotype names. Each line ends with CR/LF.

ESC + ENQ + 5	Paper near end enquiry

(1BH)+(05H)+(05H), ***(27)+(5)+(5) decimal***

Requests the status of the paper-near-end sensor. In a ”paper-low” situation, this condition is reported (LOW level) for approximately 200 ms on the **parallel interface** (PE line, pin 12 in the 36-pole Amphenol connector).

ESC + ENQ + 6	Status enquiry

(1BH)+(05H)+(06H), ***(27)+(5)+(6) decimal***

This command can only be used with TTP 52xx models and provided they are connected through the **serial** interface.

Results in a 2-byte status response. Refer to Section 6.2 on page 49.

ESC + ENQ + 7	Program version enquiry

(1BH)+(05H)+(06H), ***(27)+(5)+(7) decimal***

This command can be used with all TTP 5xxx models connected through the **serial** interface.

Requests 2-byte information about the installed firmware version.

ESC + ENQ + 8	Presenter clear enquiry

(IBH)+(05H)+(8), ***(27)+(5)+(8) decimal***

Requests status from the presenter sensor. If paper is present in the presenter, this condition is reported (LOW level) for approximately 200 ms on the **parallel** interface (PE line, pin 12 in the 36 pin Amphenol connector).

ESC+F+n1..nx NUL	Set horizontal tabs

(1BH)+(46H)+n1...nx+(00H), ***(27)+(70)+n1...nx+(0) decimal***

This command defines the desired horizontal tab positions. Variables n1...nx represent each tab position. Up to 16 tab positions are allowed. Minimum allowed value is ”1”.

Note that the tab positions are always expressed in number of steps at 10 cpi.

n = 1 Represents the second character position (at 10 cpi) from the left-hand edge of the print window.

Example: n= 25 represents the 26th character position (at 10 cpi) from the left-hand edge of the print window.

NOTE! *— Do not use value n = 0*

ESC + f + n	Presenter function

(1BH)+(66H)+n, ***(27)+(102)+n decimal***

n = 0 Default value. The presenter catches the leading paper edge, loops the paper, and ejects it after completed print and cut-off or as defined by default parameter n37 (see Section 5.3, page 43).

n = 1 Presenter sensor is ignored. The paper is fed straight through the presenter. Can be turned ON/OFF at any time during an operation.

ESC + FF + n	Eject only

(1BH)+(0CH)+n, ***(27)+(12)+n decimal***

To be used following an ESC + RS command. ESC+FF+n effects ejection through the presenter module of a previously cut-off document. Variable n represents the number of eject steps, each of approximately 2 mm length. The maximum number of steps is 255.

The primary use of this command is to eject a document only partially (partly retained in the presenter module). The command can also be used to partially eject a long document, also without preceding cut, during ongoing processing to limit the size of the loop build-up inside the presenter.

ESC + g + n1 .....n5	Print logotype

(1BH)+(67H)+n1....n5, ***(27)+103)+n1.....n5 decimal***

Prints a customised logotype stored in the flash PROM.

n1 One-byte logotype identification No. (0—15)

n2n3 Two-byte definition of desired print position in X-direction (expressed in pixels) measured from left-hand edge of the page (see page 17 regarding definition of ”page”). X-direction is perpendicular to the paper transport direction in portrait mode; parallel with the paper transport direction in landscape mode.

n4n5 In landscape mode, two-byte definition of desired print position in Y-direction (in pixels) measured from the left-hand edge the page. In portrait mode, the Y-position is ignored as logotype print always starts from the current Y-position in this mode.

Logotype transfer time is a function of logotype size. Printing is effected at standard speed.

ESC + h + n	Set multiple-height print mode

(1BH)+(68H)+n, *(27)+(104)+n decimal*

NOTE! — *This command is active only in double height mode set with the ESC + SO command. The ESC + h + n command stays active as long as the printer remains in the "Double Height" mode.*

Applicable n values are 1 — 15 expressed in decimal or hexadecimal form.

n = 1 Gives double standard default character height.

n = 2 Gives three times standard default character height etc.

In combination with double character width (SO), n values in the range 1— 5 or 6 give highly usable characters sizes depending on the font to which the command has been applied.

Only one character height can be selected for any given print line but note that this height command can be applied to any of the available fonts. Different fonts can be intermixed on the same print line.

ESC + J + n	Paper advance

(1BH)+(4AH)+n, *(27)+(74)+n decimal*

The value n represents the number of 0.125 mm pixel lines at which the paper is to be transported forwards. Maximum value for n is 255, equal to approximately 32 mm.

ESC + j + n	Paper reverse

(1BH)+(6AH)+n, *(27)+(106)+n decimal*

This command shall precede a print command. It must not be executed as the last command after cut because the leading paper edge will loose its contact with the cutting mechanism. When the paper advances again, it will follow the platen down and cause paper jam.

The value n represents the number of pixel lines (at 0.125 mm) at which the paper is to be transported in reverse. Maximum 140 pixel lines reverse feed is allowed immediately after a cut operation, or the printer will loose its grip of the paper.

NOTE! *— Only active in portrait mode. Inhibited immediately following power ON.*

NOTE! *— 8 to 16 paper advance steps following a reverse transport is advised in order to absorb any backlash in the transport mechanism.*

NOTE! *— Excessive use of the paper reverse transport may lead to reduction of the useful life of the thermal print mechanism due to mechanical gear backlash.*

ESC + O + n1 + n2	Absolute line positioning

(1BH)+(4FH)+n1+n2, *(27)+(79)+n1+n2 decimal*

Moves the paper forward to the specified pixel line position.

ESC + q + n	Burn time adjustment

(1BH)+(71H)+n, *(27)+(113)+n decimal*

Value n represents the ON time of the thermal head resistors. This command adjusts the burn time to get optimal print contrast for the paper quality in use.

Default value = 5 . Adjustment range is 1—15.

***NOTE!** — Higher values than 5 affects the thermal head negatively.*

ESC + R + n	Select national character set

(1BH)+(52H)+n, *(27)+(82)+n decimal*

Selects one of thirteen national character sets specified by n. Legitimate n values are listed below. Invalid values are ignored. The language used at power ON is determined by default parameter n5 (see Section 5.3, page 43).

This command has no effect on downloaded (user-defined) character sets.

n	Language	n	Language	n	Language
1	USA	5	Spain 1	9	Norway
2	Germany	6	Italy	10	Denmark 2
3	Great Britain	7	Sweden	11	Spain 2
4	France	8	Denmark 1	12	Latin America
				13	Japan

Tables on pages 59 and 60 list all characters in the basic character set and the national substitute character sets.

***NOTE!** — The ESC + R + n command has been included only to create compatibility with the TTP 5000 printer model. The command only applies in 7-bit communications environments. It has no effect in modern 8-bit communication where the IBM II characters set with 256 characters applies.*

ESC + RS	Cut paper

(1BH) + (1EH), ***(27) + (30) decimal***

Effects paper cut-off only. No eject function even when such feature is present.

If the document produced so far is less than 75 mm, the paper will automatically be advanced to 75 mm total length before being cut.

Use command ESC+FF+n to eject the document.

ESC+S+n1+n2	Select graphics mode

(1BH)+(53H)+ n1+n2, ***(27)+(83)+n1+n2 decimal***

Selects bit-image graphics mode.

n1 and n2 High and low order byte respectively specifying the number of pixel lines.

n1 and n2 Must be 1-byte hexadecimal or decimal numbers.

The host must supply the number of data bytes specified by n1+n2 multiplied by the number of bytes per pixel line as follows:

60 mm printer mechanism : 56 bytes per pixel line

80 mm printer mechanism : 72 bytes per pixel line

112 mm printer mechanism : 104 bytes per pixel line

Printout is effected automatically for each received pixel line.

The printer is set in character mode if n1 = n2 = 0

Of commands issued before the ESC+S+n1+n2, only ESC+T+n (set/reset reversed printing) remains valid after execution of the ESC+S+n1+n2 command.

In bit-image graphics mode, all character codes are disabled and processed as bit-image data. Data overflowing the specified print area is treated as characters. If less data than specified is received, the printer may enter a wait state, expecting further data. The printer may handle subsequent character code, or non bit-image data, as bit-image data. The printer is automatically reset if the wait state exeeds approximately 10 seconds.

ESC + SI	Reset from double-height mode

(1BH)+(0FH), ***(27)+(15) decimal***

Resets the printer to normal mode from double height mode (selected with command ESC + SO). The ESC+SI command is valid only in double-height mode.

NOTE! *— If more than 240 characters are sent to the printer before an LF, an automatic print-out of the first part of the line buffer takes place. This print-out will be made with the "double height" status known to the printer at the time.*

ESC + SO	Set double-height print mode

(1BH)+(0EH), ***(27)+(14) decimal***

Places the printer in double-height mode, printing double height characters.

A print line cannot contain both normal-height and double-height characters, but double height can be combined with double width for creating "Quadruple" characters.

Different fonts can be mixed on the same print line.

It is possible to expand the character height beyond the double default character height by adding, in the ESC SO mode, the additional command ESC + h + n. Please refer to that command, page 23.

NOTE! *— If more than 240 characters are sent to the printer before an LF, an automatic print-out of the first part of the line buffer takes place. This print-out will be made with the "double height" status known to the printer at the time.*

ESC + T + n	Reversed print mode on/off

(1BH)+(54H)+n, ***(27)+(84)+n decimal***

Selects normal or reversed print mode.

n = 0 Gives normal print, black on white

n = 1 Gives reversed print, white on black

ESC + W	Windows mode ON/OFF

(1BH)+(57H), (27)+(87) ***decimal***

Sets the printer into Windows mode. At repeat of the command, the printer exits from the Windows mode.

This command is only used by the TTP5X00 Windows drivers and should not be used in other contexts. It will not be further described.

4.2 Label- and other top-of-form oriented commands

A label consists of a block of defined length or height. This block can contain up to 16 fields of each of the following types:

- Bar code data field (No. 0—15)
- Comment data field (No. 0—15)
- Bit image graphics field (No. 0—15)

The label block can also contain vertical and horizontal ruler lines, 16 lines altogether (0—15).

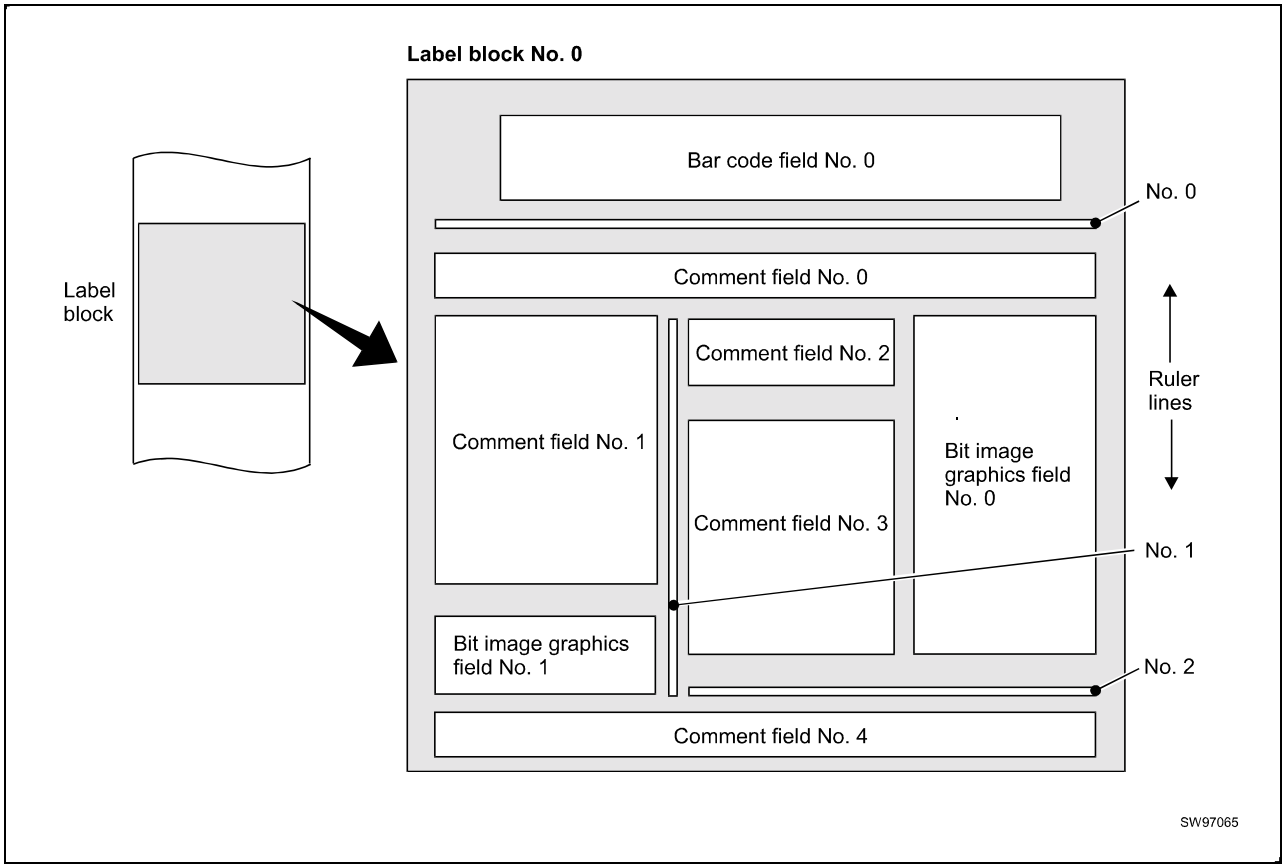


Figure 4. Label configuration

ESC+A+n1+n2+n3	Set label (block) length

(1BH)+(41H)+n1+n2+n3, *(27)+(65)+n1+n2+n3 decimal*

Determines the length of the label block to be printed.

The printer control board has approximately 50 K bytes of page memory available for data storage. With this page memory, the maximum available block length (lmax.) is 600 pixel lines, equal to approximately 75 mm paper length in the 80 mm wide mechanism.

n1 Specifies block No. (0—15).

*We strongly recommend using only one block for the entire document, that is, **n1 = 0**.*

n2n3 Specifies effective label (block) length expressed in dot lines.
n2 = higher order byte, n3 = lower order byte
n2 and n3 are 1-byte hexadecimal or decimal numbers. The value specified by n2 and n3 must not exceed the maximum effective length as specified above.

***NOTE!** — This command should not be used when printing in landscape mode as determined with command ESC ! n.*

ESC + BC + b1	Clear bar code field

(1BH)+(42H)+(43H)+b1, *(27)+(66)+(67)+b1 decimal*

This command clears the bar code field reserved by command ESC + BS.

b1 Specifies the bar code field No. (0—15). The fields may be specified in any order but b1 values other than 0—15 are ignored.

ESC+BS+b1+b2+...+b11	Reserve bar code field

(1BH)+(42H)+(53H)+b1+b2+...+b11, ***(27)+(66)+(83)+b1+b2+...+b11 decimal***

Bar codes can only be printed in portrait mode.

The command reserves an information field as a bar code field. The command also identifies the type, number of digits, and the configuration of bars to be placed in the bar code field.

b1 Specifies the bar code field No. (0—15). Bar code fields may be specified in any order. Any value other than 0—15 is ignored.

b2b3 Specifies the X co-ordinate of the bar code field origin (b2 is the higher-order and b3 the lower-order byte).

b2 and b3 must be 1-byte hexadecimal or decimal numbers. The values must not place the bar code outside the total pixel count that can be handled by the printer, that is, 56, 72 and 104 bytes for the 60 mm, 80 mm and 112 mm mechanisms respectively.

b4b5 Specifies the Y co-ordinate of the bar code field position, (b4 is the higher-order and b5 the lower-order byte).

b4 and b5 must be 1-byte hexadecimal or decimal numbers. The value specified by b4b5 must not the effective length specified with the ESC+ A command.

b6 Specifies the number of bar code digits.

b7b8 Specifies the height of the bars. b7 and b8 must be 1-byte hexadecimal or decimal numbers. The value specified by b7 and b8 must not place the bar code outside the effective length specified in the ESC + A command.

b9 Specifies the type of bar code. The following types are supported.

b9 = 0 EAN 13 and UPC-A

b9 = 1 EAN 8

b9 = 2 2/5 Interleaved (even number of characters must be sent)

b9 = 6 Code 39

NOTE!
For the EAN and UPC codes, the printer calculates the necessary check digit.

For Code 39, the start and stop character "" is generated by the printer.*

For UPC-A, use b9 value = 0 and insert a prefix "0" before the 11 digit data string.

b10 Specifies the thickness of the narrow bar

0 = 1 pixel	1 = 2 pixels	2 = 3 pixels
3 = N/A	4 = 5 pixels	5 = 6 pixels
6 = 7 pixels	7 = 8 pixels	

All other values are invalid.

b11 Specifies the wide-bar-to-narrow-bar ratio.

b11 value	Narrow bar	Wide bar
0	1	1.5
1	1	2
2	1	2.5 (May be difficult to read)
3	1	3
4	1	3.5

The lower three bits of the b11 byte are significant (some ratio values may not be processed properly). The above values serve only as guidance values.

ESC+BW+b1+b2...+NUL	**State bar code data**

(1BH)+(42H)+(57H)+b1+b2..bx + (00H), ***(27)+(66)+(87)+b1+b2...+ (0) decimal***

Fills bar code field reserved by the ESC+BS command with data to be printed.

b1 Specifies the field No. (0—15). Fields can be specified in any order but other values than 0—15 are ignored.

b2 . . . bx Specifies bar code data bytes.

NUL must be placed at the end of the bar code data.

Any invalid bar code character terminates the command.

Print-out is effected by an ESC + P command.

ESC+DC+d1	Clear comment field

(1BH)+(44H)+(43H)+d1, ***(27)+(68)+(67)+d1 decimal***

Clears the comment field reserved by the ESC+DS command.

d1 Specifies the comment field to be cleared (0—15).

Comment fields can be specified in any sequence but other values than 0—15 are ignored.

Of command codes specified before this command, only ESC+T+n, (reversed printing) remains in effect after execution of ESC+DC+d1.

ESC+DS+d1+d2+...+d7	Reserve comment field

NOTE! — *The comment field function does not apply in combination with landscape mode set through the ESC + ! + n command or the default parameter set-up.*

(1BH)+(44H)+(53H)+d1+d2..., ***(27)+(68)+(83)+d1+d2... decimal***

Reserves a comment field within a label block defined by the ESC+A+n1+n2 command. The command also specifies the type, orientation and number of comment columns (character positions) to be placed in the comment field area.

d1 Specifies comment field No. (0—15). Comment fields can be specified in any sequence but other values than 0—15 are ignored.

d2d3 Specifies the X co-ordinate of the comment field origin.

d2 is the higher-order and d3 the lower-order byte. d2 and d3 must be 1-byte hexadecimal or decimal numbers. The value specified by d2d3 must not exceed the total pixel count that the selected printer mechanism can handle, that is, 56, 72 and 104 bytes for the 60 mm, 80 mm and 112 mm mechanisms respectively.

d4d5 Specifies the Y co-ordinate of the comment field origin.

d4 is the higher-order and d5 the lower-order byte. d4 and d5 must be expressed in 1-byte hexadecimal or decimal numbers. The value specified in d4d5 must not exceed the effective label block length specified in the ESC+A command.

d6 Specifies the number of comment columns (character positions).

d7 Character type

Bit	Character type
7	Orientation, 0 = Portrait, 1 = Landscape
6	Not used
5,4,3	Determine height of characters. 8 different heights (0—7) can be selected
2,1,0	Determine width of characters. 8 different widths (0—7) can be selected

No more than one orientation and one type of character can appear in the same comment field.

Use the following formula to calculate the value of d7:

d7 = **R** + (**H** * 8) + **W**

R represents orientation, value **0** (zero) for portrait mode, value **128** for landscape mode.

H represents character height, **numbers 0—7** (multiplied by 8)

W represents character width, **numbers 0—7** (multiplied by 8)

Example:
Assume landscape mode, character height = 6, character width = 4

d7 = 128 + (5 * 8) + 3 **= 171**

This can be written in Basic as:

```
R=128                       REM Select landscape mode
H=5                         REM Character height is 6
W=3                         REM Character width is 4
Print CHR$(R+(H*8)+W)       REM Convert to ASCII char. & print
```

Smallest character size is 12 pixels high and 8 pixels wide. This is represented by H = 0, W = 0.

Largest character size is 96 pixels high, (8*12) and 64 pixels wide, (8*8).

Any combination of H and W are permissible although a number of combinations are impractical as being out of proportion. Resolution in both directions is 8 pixels/mm.

Co-ordinates d2d3 and d4d5, specifying the X and Y location of a comment field, always refer to the top left-hand corner of the first character in the field, both in portrait and in landscape mode.

ESC+DW+d1+d2...+NUL	State comment field data

(1BH)+(44H)+(57H)+d1+d2...+(00H), ***(27)+(68)+(87)+d1+d2...+0 decimal***

Fills comment field reserved by the ESC+DS command with comment data.

d1 Specifies comment field No. (0—15) that may be specified in any sequence. d1 values other than 0—15 are ignored

d2... Specifies comment data byte(s).

NUL Must be placed at the end of the comment data.

Any invalid command character terminates the ESC+DW command.

Of commands specified before ESC+DW, only ESC+T+n (reversed printing) remains in effect after execution of the ESC+DW command.

Print-out is effected by an ESC + P command.

ESC + E	Clear all label fields

(1BH)+(45H), ***(27)+(69) decimal***

Clears all label fields.

Of command codes specified before this command, only ESC+T+n, (reversed printing), remains in effect after execution of ESC+E.

ESC+GC+g1	Clear graphics field

(1BH)+"GC"+g1, ***(27)+"GC"+g1 decimal***

Clears graphics field reserved by ESC+GS command.

g1 Specifies graphics field (0—15) in any sequence. Values other than 0—15 are ignored.

Of command codes specified before this command, only ESC+T, (reversed printing) remains in effect after execution of ESC+GC.

ESC+GS+g1+g2+...+g8	Reserve graphics field

(1BH)+(47H)+(43H)+g1+g2+...+g8, ***(27)+(71)+(67)+g1+g2+...+g8 decimal***

Reserves a graphics field within a label block defined with command ESC+A+n1+n2. The ESC+GS command also defines the size of the graphics field.

g1 Specifies graphics field No. (0—15). Graphics fields may be specified in any order, but values other than 0—15 are ignored.

g2g3 Specifies X co-ordinate of the graphics field origin. g2 is the higher-order and g3 the lower-order byte. g2 and g3 must be 1-byte hexadecimal or decimal numbers and the value specified must not exceed the total pixel count that can be handled by the printer mechanism, that is, 56, 72 or 104 bytes for the 60, 80 and 112 mm mechanisms respectively.

g4g5 Specifies the Y co-ordinate of the graphics field origin.

g4 is the high-order and g5 the lower-order byte and they must be 1-byte hexadecimal or decimal numbers. The value specified by g4g5 must not exceed the effective length specified in the ESC + A command.

g6 Specifies number of bytes in the X-direction.

60 mm mechanism	Max. 56 bytes
80 mm mechanism	Max. 72 bytes
112 mm mechanism	Max. 104 bytes

g7g8 Specifies the number of lines in the Y direction, (g7 is the higher-order and g8 the lower-order byte). g7g8 must be 1-byte hexadecimal or decimal numbers. The value specified by g7g8 must not exceed the effective length specified by ESC+A.

ESC+GW+g1+g2+...+gn	State graphics data

(1BH)+(47H)+(57H)+g1+g2+...+gn, *(27)+(71)+(87)+g1+g2+...+gn decimal*

Fills the graphics field reserved by the ESC+GS with graphics data.

g1 Specifies graphics field No. (0—15) in any order. Other values than 0—15 are ignored.

g2...gn Specifies graphics data bytes.

Number of data bytes g2....gn: (number of bytes in X direction multiplied by number of lines in Y direction)

All character and control codes are invalid. The printer will process any code as bit-image data

Any data overflowing the specified graphics field is ignored.

If less data than specified in this command is received, the printer may either enter into a wait state, waiting for further data, or it may handle subsequent character codes and other non bit-image data as bit-image data.

The host computer must supply as many data bits as the data bit count specified in this command.

Of command codes specified before this command, only ESC+T+n, (reversed printing) remains in effect after execution of the ESC+GW command.

Print-out is effected by an ESC + P command.

ESC + LC + l1	Clear ruler line area

(1BH)+(4CH)+(43H)+l1, *(27)+(76)+(67)+l1 decimal*

Clears ruler line defined with command ESC+LS+l1+l2...+l10

l1 Specifies ruler line number (0—15) in any order. Values other than 0—15 are ignored.

Of command codes specified before this command, only ESC+T+n remains valid after execution of this command.

ESC+LS+l1+l2...+l10	Set ruler line data

(1BH)+(4CH)+(43H)+l1+l2...+l10, *(27)+/76)+(83)+l1+l2+...+l10 decimal*

Draws a horizontal or vertical ruler line in the label block defined by the ESC + A command. The command also defines the thickness of the ruler line.

l1 Specifies ruler line No. (0—15) in any order. Values other than 0—15 are ignored.

l2l3 Specifies X co-ordinate for the ruler line origin (l2 is the higher-order and l3 the lower-order byte). l2 and l3 must be 1-byte hexadecimal or decimal numbers. The value specified by l2 and l3 must not exceed the total pixel count that can be handled by the printer.

l4l5 Specifies Y co-ordinate for the ruler line origin (l4 is the higher-order and l5 the lower-order byte). l4 and l5 must be 1-byte hexadecimal or decimal numbers and the value specified by l4l5 must not exceed the effective length specified in the ESC + A command.

l6l7 Specifies the X co-ordinate of the end of the ruler line. (l6 is the higher and l7 the lower order byte). l6 and l7 must be 1-byte hexadecimal or decimal numbers and the value specified by l6l7 must not exceed the total pixel count that can be handled by the selected printer mechanism, that is, 56, 72 or 104 bytes for the 60, 80 and 112 mm mechanisms respectively.

l8l9 Specifies the Y co-ordinate of the end of the ruler line. (l8 is the higher and l9 the lower order byte). l8 and l9 must be 1-byte hexadecimal or decimal numbers. The value specified by l8l9 must not exceed the effective length specified in the ESC + A command.

l10 Specifies the thickness of the ruler line:

0 = 1 pixel	4 = 5 pixels
1 = 2 pixels	5 = 6 pixels
2 = 3 pixels	6 = 7 pixels
3 = 4 pixels	7 = 8 pixels

Only the lower 3 bits of the l10 byte are significant.

Example:

Bit No.	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Bit value	128	64	32	16	8	4	2	1
Example	0	0	0	0	0	**1**	**1**	**0**

Bit value **4 +** bit value **2** = **6** (= 7 pixels line)

l2l3 must be smaller than l6l7 and l4l5 must be smaller than l8l9.

Any invalid parameter combination is ignored.

The printer cannot draw slanted lines.

Of commands specified before the ESC + LS command, only ESC + T, (reversed printing) remains in effect after execution of ESC + LS.

Print-out is effected by an ESC + P command.

ESC + M+n1+n2	Top-of-form definition

(1BH)+(4DH)+n1+n2, *(27)+(77)+n1+n2 decimal*

This command specifies maximum (n1) and minimum (n2) length of the TOF (Top-of-Form) mark printed reverse side of the paper. The TOF mark identifies the top of the next form (document). The length of the mark is expressed in pixel lines of 0.125 mm height.

Active transition is from ”black” to ”white” (trailing edge of TOF mark)

n1 Maximum valid value is 160 pixel lines (20.0 mm). Default value = 128 pixel lines (16.0 mm)

n2 Minimum valid value is 15 pixel lines (1.9 mm). Default value = 24 pixel lines (3.0 mm)

NOTE ! *— These values do not represent the actual TOF mark length. Differences are due to sensor focus variations.*

ESC + P + n1	Print label (block)

(1BH)+(50H)+n1, *(27)+(80)+n1 decimal*

Prints a label (block)

n1 Specifies the label block No. (0—15) to be printed.
(Usually only block No. 0 is defined and used. See command ESC+A+n1+n2+n3 on page 28).

n1 = <7FH> or <127> decimal specifies that all label blocks are to be printed (approximately 50 Kbytes of page memory). Other n1 values are ignored

NOTE! *— In landscape mode, printing is effected with the FF command.*

ESC + X + n1 + n2	Sense top-of-form position

(1BH)+(58H)+n1+n2, *(27)+(88)+n1+n2 decimal*

Reports if a top-of-form position marker is sensed within the distance (paper transport) specified by n1n2, starting at the current position.

n1n2 Specifies the distance to be searched for TOF marker. n1 is the higher-order and n2 the lower-order byte. n1n2 must be 1-byte hexadecimal or decimal numbers. The distance is to be expressed as a number of 0.125 mm steps.

The printer adds an error code in the status report (error, top of form, byte 1, bit 3) if no TOF position marker is found within the specified distance.

ESC + x + n1 + n2	Set internal TOF counter at 256*n1+n2

(1BH)+(78H)+n1+n2, ***(27)+(120)+n1+n2 decimal***

Presets an internal counter to value 256 x (n1+n2) corresponding to a number of pixel line feeds.

At completed printout, an ESC + Z command effects paper feed until a TOF mark is detected, that is, when black-to-white transition is detected at the trailing edge of the TOF mark. The paper feed then continues while the counter decrements to ”0”, at which point the correct cut position is assumed.

ESC + Y + n1 + n2	Set print start position

(1BH)+(59H)+n1+n2, ***(27)+(89)+n1+n2 decimal***

Defines the number of pixel lines between the top-of-form position sensed by the mechanism’s paper-out/TOF sensor and the position at which the printing is to start. The printer advances the paper by the number of pixel lines specified in this command before printing starts.

n1n2 Specifies the number of pixel lines by which the paper is to be transported forward before printing starts. n1 is the higher-order and n2 the lower-order byte.

n1 and n2 must be 1-byte hexadecimal or decimal numbers.

The printer enters into an error mode if a paper-out condition occurs while feeding the paper as specified by n1n2 in this command.

The paper feed length n1n2 must be greater than, or equal to, the length (in paper transport direction) of the TOF mark. The printer will signal a paper out condition if the paper feed length is less than the length of the TOF mark.

ESC + Z	Go to next top-of-form

(1BH)+(5A), ***(27)+(90) decimal***

Executes the number of pixel line feeds as defined by command ESC+x+n1+n2 **minus** such pixel line feeds that have been effected after detection of TOF mark.

NOTE! — *If the TOF mark has not passed the paper-out/TOF sensor when the ESC + Z is received, additional paper feed (maximum 128 mm) takes place until a TOF mark is detected.*

5 DOWNLOADABLE CHARACTER SETS, LOGOTYPES AND FIRMWARE

5.1 User-defined character set

Refer to software command ESC & NUL and figures on the next page.

New character sets can be downloaded sequentially using the ESC & NUL command. A downloaded character set consists of a header containing data describing the font as well as data for every character in the set. The header has to be downloaded even if the character set consists of a single character only. A number of character sets can have the same visual appearance and belong to the same font, e.g. 10, 12, 15 and 17 cpi. Below is a description of the header required for every character set.

From an estetic point of view, we recommend using the character matrix proportions 2 : 3 (width : hight).

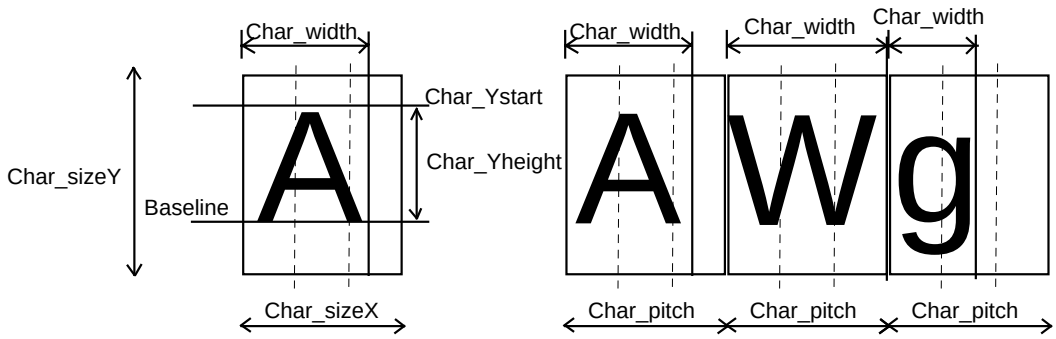
ESC & NUL

1 byte	Font_num	Filler byte
1 byte	Char_set_num	Filler byte
1 byte	Char_sizeX	The number of bytes required for the width of one character, usually 2 or 3.
1 byte	Char_pitch	The maximum width of one character in the set. This value is used for tab position calculation.
1 byte	Char_sizeY	The maximum height of one character matrix measured in pixels. This is also the minimum line spacing for this character set.
27 byte	Char_set_name	String of characters used to identify the character set. This will be printed on status receipts. (e.g. Swiss 10 cpi.)

Char_matrix table: 256 records, each containing 3 bytes.

3 byte Char_width (pixels) + Char_Ystart(pixels) + Char_Yheight(pixels)

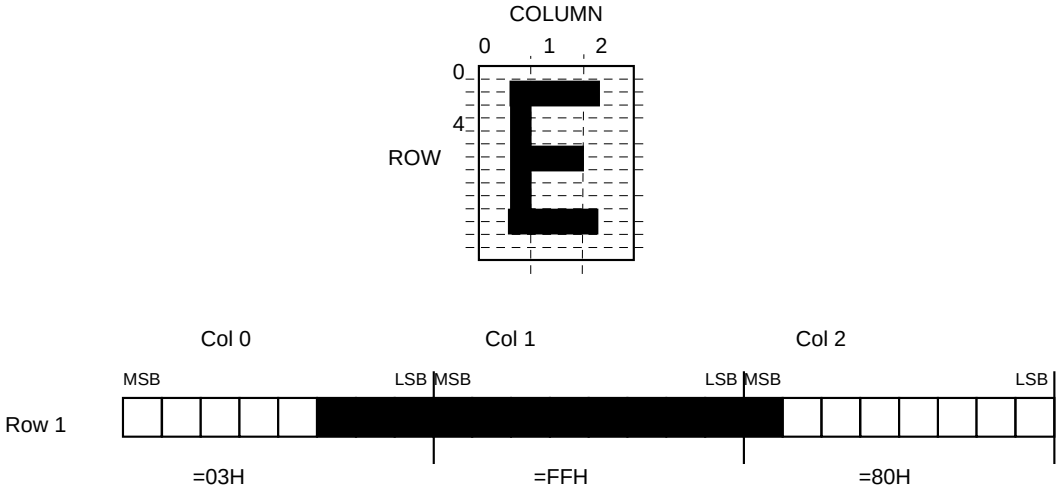
Char_bitmap data: Bitmap data for all characters that are to be defined.



Character bitmap data:

A character is made up of a bitmap the size of which is:

Char_sizeX * Char_Yheight bytes.



The bitmap data consists of bitmap patterns for each character in a character set for which the parameter Char_width in the Char_matrix table is set to a value between 1 and 24. A character that has its Char_width set to zero, is not included in the bitmap data.

The bitmap for one character is then defined according to the following table:

(COL 0, ROW Ystart) , (COL 1, ROW Ystart) , (COL 2, ROW Ystart)

(COL 0, ROW Ystart+1) , (COL 1, ROW Ystart+1) , (COL 2, Ystart+1)

.
.
.

(COL 0, ROW Ystart+Yheight), (COL 1, ROW Ystart+Yheight), (COL 2, ROW Ystart+Yheight)

In this example, each row consists of 3 columns equal to 3 bytes.

In order to minimise the required storage space, only rows between Ystart and Ystart+Yheight are included in the character bitmap.

Time required for printer processing of character download data, excluding transfer time from the PC is typically 15 seconds, maximum 20 seconds, per character set. During this time, any data sent to the printer will be lost.

NOTE ! *— Download is finalized by an internal reset visible by the presenter motor being driven momentarily.*

CAUTION! — *Downloading to the flash PROM will erase the RAM completely since the RAM is used during the downloading process. Any print data residing in RAM will thus be lost.*

5.2 User-defined logotype

Refer to software command ESC & 1...

One or more logotypes can be downloaded sequentially to the printer using the ESC & 1 command sequence. The exact number of logotypes and their sizes is determined by the total amount of memory used for logotypes and downloaded firmware.

The total amount of free memory is printed on the status receipt.

A header containing information about the logotype number, size and logotype name shall define each downloaded logotype. Immediately after the header follows the actual bitmap of the logotype.

ESC + & + 01H + Header + Bitmap

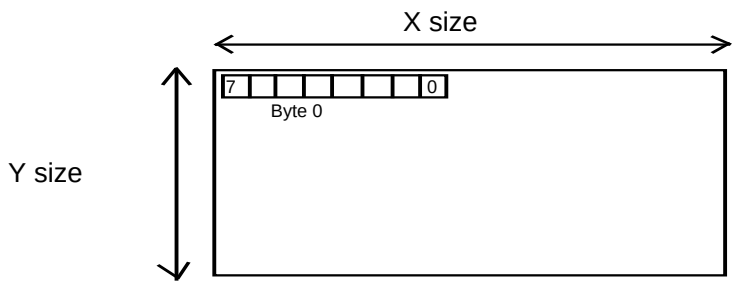
Header contents:

Byte 0	Logotype number used to identify the logotype when printing.
Byte 1	X size measured in bytes.
Byte 2	Y size measured in pixels.
Byte 3—15	Logotype name that will be printed on status receipts.

Bitmap:

The bitmap **must** have exactly (X size * Y size) number of bytes.

Bit No. 7 in byte 0 represents the top left corner of the logotype.



Note that a bitmap is downloaded in portrait mode. The logotype will be rotated 90 degrees when the printer is in landscape mode.

The memory used to store logotypes is not automatically cleared.

All logotypes can be cleared with the ESC & L command.

Logotype printing:

The logotype print command is ESC + g + n1..n5 where n1..n5 determine which logotype to print and its print position.

n1	One byte logotype number, (0—15)
n2n3	Two byte X position measured in pixels from the left hand edge of the print window. Applies both in portrait and landscape mode.
n4n5	Two byte Y position measured in pixels from the top of the print window in landscape mode. The Y position is ignored in portrait mode as logotype printing always starts from the current Y position when the printer is in portrait mode.

Time required for printer processing of logotype download data, excluding transfer time from the PC, is typically 15 seconds, maximum 20 seconds, per logotype. During this time, any data sent to the printer will be lost.

CAUTION! — *Downloading to the flash PROM will erase the RAM completely since the RAM is used during the downloading process. Any print data residing in RAM will thus be lost.*

5.3 Default parameters

Refer to software command **ESC & 2 n1...n41**

A set-up string containing modified default settings for the printer can be loaded and permanently stored using the **ESC & 2 n1...n41** command. Note that, with this command, values for all parameter settings have to be sent even if only some of the parameters should be changed.

Some parameters can be individually set using other ESC commands, for instance n12 can be set by **ESC q n** for burn-time adjustment. The parameters modified this way can be permanently stored by the **ESC + & + 4** command.

The following table lists the individual bytes in the set-up command. A parameter without explicitly stated range of valid entry values could be set to any value between 0 and 255d. All values are expressed in one byte decimal.

Byte	Name	Valid entry
n1	Printer width	60d, 80d or 112d (equal to paper width)
n2	Character parameters	Bits 3—7 as defined in the ESC + ! + n command
n3	Character set	0—7 as defined by bits 0, 1 and 2 in the ESC + ! + n command
n4	Not used	Arbitrary value must be stated.
n5	Language	0—13 as defined in the ESC + R + n command
n6	Baud rate	Baud rate 1200, 2400, 4800, 9600, 19200, 38400 or 57600 (Only underlined digits should be used.)
n7	Data bits	8, fixed
n8	Parity	0 = No parity, 1 = odd parity, 2 = even parity
n9	Handshaking	This parameter is a bit field where the bits control various communication related features of the printer. LSB = bit 0.

Bit 0	0 = Hardware 1 = XON/XOFF
Bit 1	0 = Silent 1 = ACK/NAK
Bit 2	0 = The computer must determine if the paper is removed from the presenter by using repeated status request commands before continuing the print operation. 1 = After receipt of an ENQ command, the printer waits until the paper is removed from the presenter before printing continues.

Examples:

n9 = 1 means: XON/XOFF, silent

n9 = 6 means: Hardware, ACK/NAK, printer waits until the paper is removed from the presenter.

n10	TOF mark maximum	Black mark size as defined by ESC+M+n1+n2
n11	TOF mark minimum	Black mark size as defined by ESC+M+n1+n2
n12	Burn time	1—15 as defined in the ESC + q + n command
n13	CR function (EOL)	0 = CR/LF (Swecoin emulation), 1 = CR (default)
n14	Portrait page length n1	As defined in the ESC + C + n1 + n2 command
n15	Portrait page length n2	As defined in the ESC + C + n1 + n2 command
n16	Line spacing	As defined in the ESC + 3 + n command
n17--n32	Tab stop	16 bytes setting the horizontal tab stop positions as defined in the ESC + F + n1..nx NUL. See page 21. All 16 bytes must be sent.
n33	Windows mode	0 = OFF Each pixel line is printed when received. (Suitable for use with Windows 3.1) 1 = ON Page buffer is filled partly or completely. Printing takes place a) When blank pixel line is received b) When the page buffer is full (1792 pixel lines = 224 mm) c) At the end of printout from Windows. Suitable for high-quality printout under Windows 95.
n34	Min. page length n1	Minimum page length (high order byte)
n35	Min. page length n2	Minimum page length (low order byte)
n36	Auto-cut after FF	0 = Cancels auto-cut 1 = Generates cut after effected form feed
n37	Variable doc. length	At value ”0”, the document length is fixed as defined by command ESC + C + n1 + n2. Other values (minimum = ”3”) define the document length, in increments of 256 pixel lines (= 32 mm), after which the presenter motor starts ejecting the document in slow eject mode to limit the size of the loop formed in the presenter.
n38	TOF marked paper	0 = Disable TOF mark detection 1 = Enable TOF mark detection
n39	Presenter motor ON	As defined in ESC + f + n
n40	Landscape page length n1	As defined in ESC a+n1 command
n41	Landscape page length n2	As defined in ESC a+n2 command

NOTE 1! *— The time required for the printer to process the default parameter data downloaded from the host is, typically, 15 seconds (max. 20 seconds). Any data sent to the printer during this time will be lost. The printer will buzz when the storing process is complete.*

NOTE 2! *— Self-test printout will show the default parameter values stored in flash PROM. Response to ESC ENQ 3 reflects the current parameter values, which can differ from the default values stored in flash PROM.*

NOTE 3! *— In cases where only values ”0” and ”1” apply, any value greater than ”1” is accepted and interpreted as ”1”.*

The following list shows the default parameter setting for a standard printer. However Swecoin delivers printers with customized parameter setups:

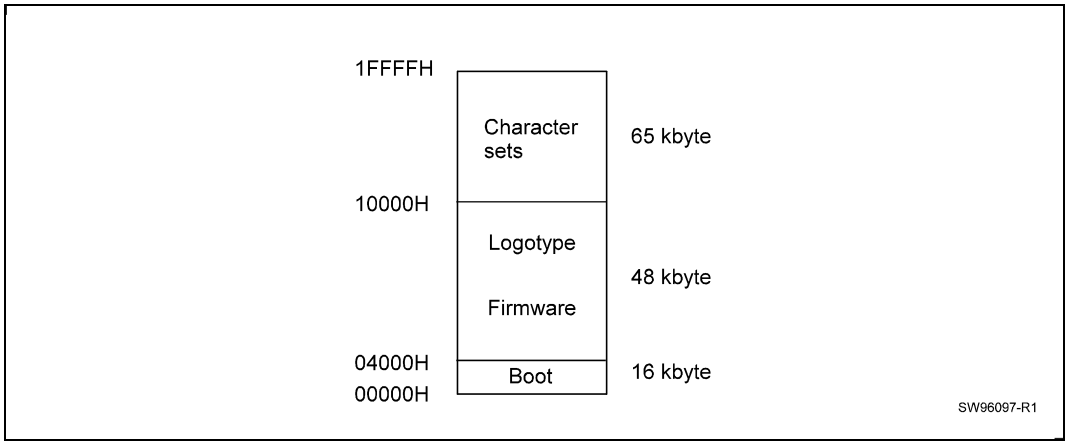
n1	60d, 80d or 112d (equal to paper width)	
n2	0	
n3	0	
n4	0	
n5	0	
n6	96	
n7	8	(fixed)
n8	0	
n9	2	
n10	128	
n11	24	
n12	5	
n13	0	
n14	4	
n15	0	
n16	0	
n17 - n32:	8, 16, 24, 32, 40, 48, 56, 64 **. . .**	
n33	1	
n34	2 **or 6**	
n35	88	
n36	1	
n37	18	
n38	0	
n39	0	
n40	6	
n41	144	

5.4 Firmware loading

5.4.1 Introduction

CAUTION! — *Loading new firmware into the flash PROM will erase the RAM completely since the RAM is used during the loading process. Any print data residing in RAM will be lost.*

The TTP 52xx firmware is stored in a 128 Kbyte flash PROM (AMD 29F010). This device is divided into 8 sectors, each of 16 Kbyte that can be separately erased and reprogrammed. Some firmware program code, called *bootstrap,* must remain in the flash PROM to control the system start-up and firmware loading. All TTP 52XX printers and control boards, and all flash PROMs supplied by Swecoin as spare parts, have the bootstrap code already installed. The bootstrap routine resides in the lower 16 Kbyte of the flash PROM (see memory map below).



Next in the flash PROM follows the actual firmware.

The area reserved for firmware and logotypes is 48 Kbyte. The available logotype area is dependent on the space occupied by the loaded firmware.

The remaining 65 Kbytes are used for character sets.

Firmware checksum calculation is made at power ON and after an ESC ? command. Failure causes program execution to remain in the boot where only the commands ESC ENQ 1 and ESC NUL are active.

The firmware can be loaded by sending the appropriate Intel hex-file to the flash PROM through the parallel (Centronics type) or serial (RS232C/V.24) interface.

NOTE! *— If the serial interface is used, 9600 baud, 8 data bits and even parity must be used.*

The hex file is a self-extractable exe file containing all information to be stored in the flash PROM. The size of the file is approximately 120 Kbyte and loading it into the printer through the parallel interface therefore saves a considerable amount of time.

CAUTION! — *When you load the hex file into the printer, previously downloaded logotypes, and any print data residing in RAM, will be lost and have to be reloaded. Previously installed character sets remain unchanged. Firmware loading also sets* ***ALL*** *parameters to the factory default values. Unless the printer is an 80 mm version, the print width has to be changed. This is easily done with the TTP Editor.*

5.4.2 Loading procedure

Use the TTP Editor program to load the firmware into the printer. The editor program can be fetched from our web site *www.swecoin.se*.

Only loading through the parallel interface is described.

1. If possible, make a test print out to document the default parameters in use.
2. Connect the printer to the parallel port LPT1 (or any serial COM port) and switch ON the printer.
3. Start the TTP Editor.
4. Select *File - New* to open an empty window.
5. Select *Settings - TTP 5200 Adaptation - Load firmware to printer*
6. Select the firmware hex file and press OK. Loading to the printer starts. Wait until the message "Download successful" is shown and the cutter motor operates.
7. Switch OFF the printer.
8. Hold the form feed button depressed while switching ON the printer. The printer enters self-test mode and prints firmware version, parameter settings etc. Verify that the new firmware version is printed.
9. Exit self-test mode by switching the printer OFF and ON.
10. Change default parameters if necessary using the TTP Editor.

Checksum verification is made both at power ON and after an ESC ? command. If the checksum is wrong the program execution will remain in the bootstrap routine that can only interpret the commands ESC ENQ 1 (status enquiry) and ESC NUL (download firmware). Repeat the loading procedure.

If the printer does not start (something can be wrong in the resident firmware) proceed as follows:

1. Switch OFF the printer.
2. Set all sensors in "wrong" state, that is, remove paper roll, remove any paper in the print module, move cutter knife away from home position, and put a piece of paper under the presenter sensor.
3. Hold the paper feed button depressed while you switch ON the printer.
4. Switch OFF the printer. The printer is now ready for firmware loading.
5. Load the firmware as described above.

6 STATUS RESPONSES

6.1 TTP 5000 compatible status response commands

The commands described in this section can be used with all TTP 5XXX models.

Sending an ENQ (05H) *Clear Presenter* or an ESC ENQ 1 (1BH 05H 01H) *Status Enquiry* to the printer, results in the printer sending a status report to the host computer. This status report reflects the status of the available sensors in the printer system and identifies possible error conditions.

The table below shows the various conditions reported following the ENQ and ESC ENQ 1 commands to the printer.

Note: *The printers offer a choice between* ***RTS/CTS*** *and* ***XON/XOFF*** *as well as between* ***Report*** *and* ***Silent*** *modes by means of default parameter setting.*

Printer response	Status
ACK	OK
NAK + 01	Paper in presenter module
NAK + 02	Cutter not in home position
NAK + 03	Printer out of paper
NAK + 04	Print head lifted

The possible error conditions are reported in the above order and the first error condition detected is reported. This means that an ENQ or ESC/ENQ has to be sent until an ACK is received before the host computer can be certain that all error conditions have been cleared.

The ENQ and ESC ENQ functions do not wait for a reported error to be cleared. The operator has to determine and take the correct action, for example, replacing the paper roll.

6.2 Additional status response command for TTP 5200/5250

Refer to software command ESC ENQ 6 (see page 20).

When the above command is received, the printer will respond with 2 bytes reflecting the status of the printer sensors and possible error conditions.

Bit value = 0 (zero) indicates that there is no error
Bit value = 1 (one) indicates an error, such as paper near end or paper end

Byte 1:

Bit 0	Paper level (weekend monitor option)	Status information only	
Bit 1	Paper near end	-"-	
Bit 2	Paper in presenter module	-"-	See Note.
Bit 3	Error Top-of-Form	-"-	
Bit 4	Print head lifted and/or test print in progress	-"-	
Bit 5	Hardware error at power ON		
Bit 6	Power has been OFF		
Bit 7	Firmware download, OK = 0, Error = 1		

Byte 2:

Bit 0	Parity error	
Bit 1	Software error, (trying to select non-existing character font and other errors)	
Bit 2	Buffer overflow	
Bit 3	Lost commands	
Bit 4	Paper end or jammed paper *)	Operator required
Bit 5	Cutter not in home position	Operator required, possibly service
Bit 6	Out-of-memory during logotype download **)	
Bit 7	Out-of-memory during character set download **)	

All error conditions are reset by commands Status Enquiry (ESC ENQ n), with the exception of the conditions requiring operator intervention. Such error conditions are reset after completed, successful test print. All data already in the printer or being sent to the printer in a ”Paper End” situation, with the exception of the ESC ENQ commands, will be lost and Byte 2, Bit 3 is set to ”1”.

*) List of valid commands at Paper end condition:
CAN; all ESC + & commands; ESC + ?; ESC + @; all ESC + ENQ commands.

**) These bits are set to ”1” if the available memory space is too small for the data sent to the printer, or if the printer cannot interpret the data. Reset is effected by ENQ command sequence or by power OFF/ON.

Note *— Byte 1, bit 2. If paper is still present under the presenter sensor after the first 64 mm paper transport after executed Cut, the Status Enquiry Response ”Paper in presenter module” is set to ”1”, thus indicating paper jam or that paper is not removed.*

7 POWER-ON TEST

If a power interruption occurs while printer parameters are being downloaded to the flash PROM, there is minor risk that some parameter might be incorrectly stored. At power-ON, a test will check the parameters for consistency by performing a checksum comparison. If a checksum error is found, bit 7 of the first byte in the Status Enquiry response is set to value 1.

8 TEST PRINTOUTS

8.1 Off-line test printout

When the form-feed button is kept depressed at power on, a printout is produced starting with identity of the boot and firmware versions. Information is also printed about installed fonts and start-up parameter settings as well as downloaded logo-types.

8.2 On-line HEX dump

A printout of all data transferred to the printer can be obtained as follows:

1. Switch the power OFF.
2. Lower the print head lever.
3. Keep the form-feed button depressed while you switch the power ON, wait until the cutter is re-positioned and raise the print head lever to vertical position
4. Release the form-feed button.

The printer is now in a HEX dump mode and all on-line communication is printed in both HEX format and ASCII character format. The printed lines are 8 characters long, each representation printed using character set 0.

If the last line to be printed in HEX mode contains fewer than 8 characters, the line is not automatically printed. A short press on the form-feed button will print the last, incomplete line.

Exit from HEX dump mode by switching the power OFF.

9 SERIAL INTERFACE

The control board is equipped with a 10-pole ribbon cable type connector. The pinout of this connector is designed to mate with a standard D-sub 9-pole male connector through a straight ribbon cable accessory. The pinouts of the 10-pole connector and the 9-pin D-sub connector are shown in the following table:

Pin No.	D-sub	Signal name	Direction	Description
1	1	—	—	Not connected
2	6	—	—	Not connected
3	2	RXD	To printer	Receive data
4	7	RTS	From printer	Request to send
5	3	TXD	From printer	Transmit data
6	8	CTS	To printer	Clear to send
7	4	DTR	From printer	Data terminal ready
8	9	—	—	Not connected
9	5	GND	Ground	
10		—	—	Not connected

The printer indicates that it is powered ON by setting DTR high. When initialised, RTS will be set high to indicate to the computer that it is ready to receive data. RTS and DTR will be set low when the buffer is almost full, thereby telling the computer to stop sending data until RTS and DTR are pulled high.

The following figures and table shows the design of the serial connector cable between the PCB 10-pin connector and the serial interface port.

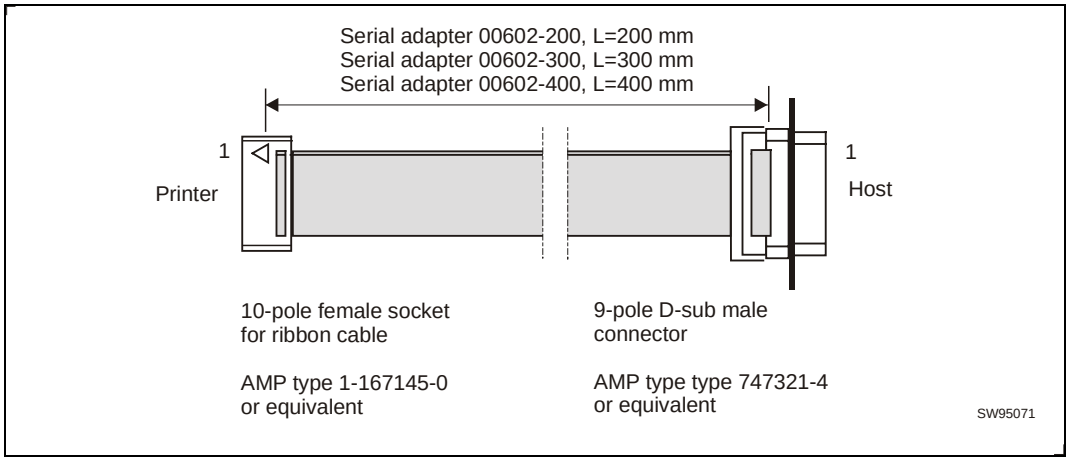


Figure 5. Serial interface adapter cable 00602-200 (accessory)

Printer			**PC**		
10-p.	9-p. D-sub	Signal	Signal	25-p. D-sub	9-p. D-sub
3	2	RXD	TXD	2	3
5	3	TXD	RXD	3	2
4	7	RTS	CTS	5	8
7	4	DTR	DSR	6	6
9	5	GND	GND	7	5

An interface adapter is available that has pins 4 and 7 on the 10-pin connector connected by a jumper. This allows handshaking using either DTR/DSR and/or RTS/CTS signals.

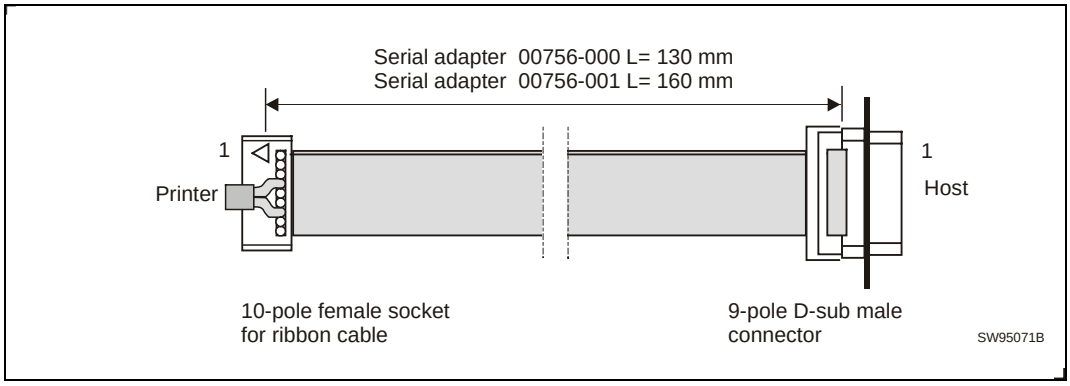


Figure 6. Serial interface adapter cable 00756-000 (accessory)

10 PARALLEL PRINTER INTERFACE

The control board has a 40-pole ribbon cable parallel interface type connector. The printer can be connected to a standard Centronics 36-pole connector using a straight ribbon cable such as the adapter cable 00601-000 (see figure below). The following table shows the pin assignment in the 40-pole connector:

40-pole conn.	Centronics	Signal	Direction	Description
1	1	STROBE	To printer	Strobe signal
3	2	D0	To printer	Data bit 0
5	3	D1	To printer	Data bit 1
7	4	D2	To printer	Data bit 2
9	5	D3	To printer	Data bit 3
11	6	D4	To printer	Data bit 4
13	7	D5	To printer	Data bit 5
15	8	D6	To printer	Data bit 6
17	9	D7	To printer	Data bit 7
19	10	ACK	From printer	Acknowledge signal
21	11	BUSY	From printer	Busy signal
23	12	Paper out	From printer	Paper out signal
25	13	Select	From printer	Selected (on line)
26	31	Init.	To printer	Printer initialisation
27	14	Autofeed	To printer	Not used in this printer
28	32	ERROR	From printer	Error signal
35	18	+5V	From printer	+5V through 47 Kohm
36	36	Select In	To printer	Not used in this printer
2	19	GND		
4	20	GND		
6	21	GND		
8	22	GND		
10	23	GND		
12	24	GND		
14	25	GND		
16	26	GND		
18	27	GND		
20	28	GND		
22	29	GND		
24	30	GND		
30	33	GND		
31	16	GND		
33	17	Frame GND		
29	15			Not connected
32	34			Not connected
34	35			Not connected
37				Not connected
38				Not connected
39				Not connected
40				Not connected

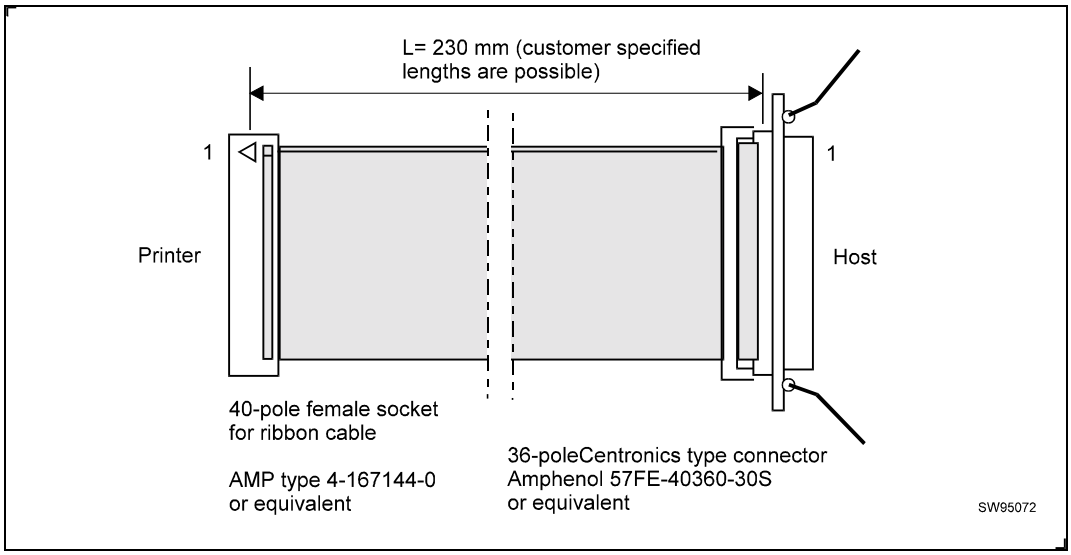


Figure 7. Parallel interface adapter cable 00601-000 (accessory)

11 POWER SUPPLY

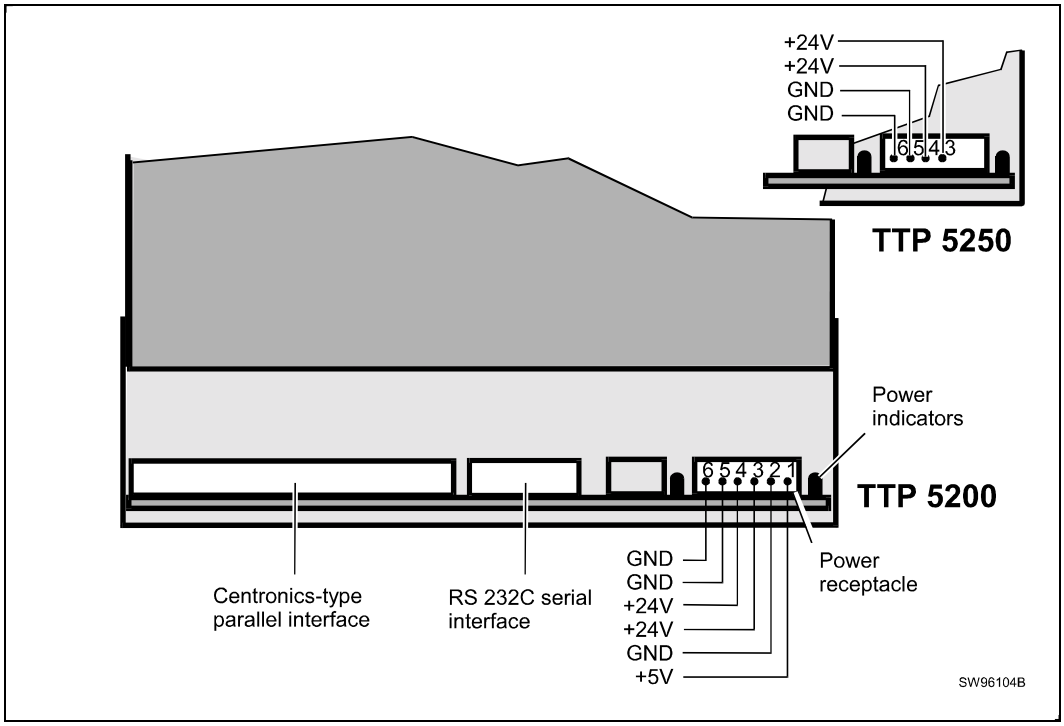


Figure 8. Power supply connector

The TTP 5250 has a built-in 5V regulator supplied with 24 VDC.

Connector type: 6-pole, female, MOLEX KK, 2.54 mm grid

Pole	Function	Pole	Function
1	+5 VDC (TTP 5200 only)	4	+24 VDC
2	GND	5	GND
3	+24 VDC	6	GND

The power requirements are as follows:

Voltage	Print mode	Current
+24 VDC ±5%	Standard text encoding/printing	2A average, 6A peak
	All black printing (35% duty cycle)	60 and 80 mm paper width: 6 A 112 mm: 10 A
+5 VDC ±5% (TTP 5200 only)		300 mA

CAUTION !

The order in which the +5 VDC and +24 VDC are established on the TTP 5200 printer control board is essential. The + 5 VDC must be established before the + 24 VDC drive voltage is brought to the board (and vice versa at power-off). Otherwise, ***there is a risk of damaging both the printer control board and the thermal print head****.*

Power supply units for evaluation purposes are available from Swecoin Promakon AB.

12 PRINTER DIMENSIONS

All measurements are in mm.

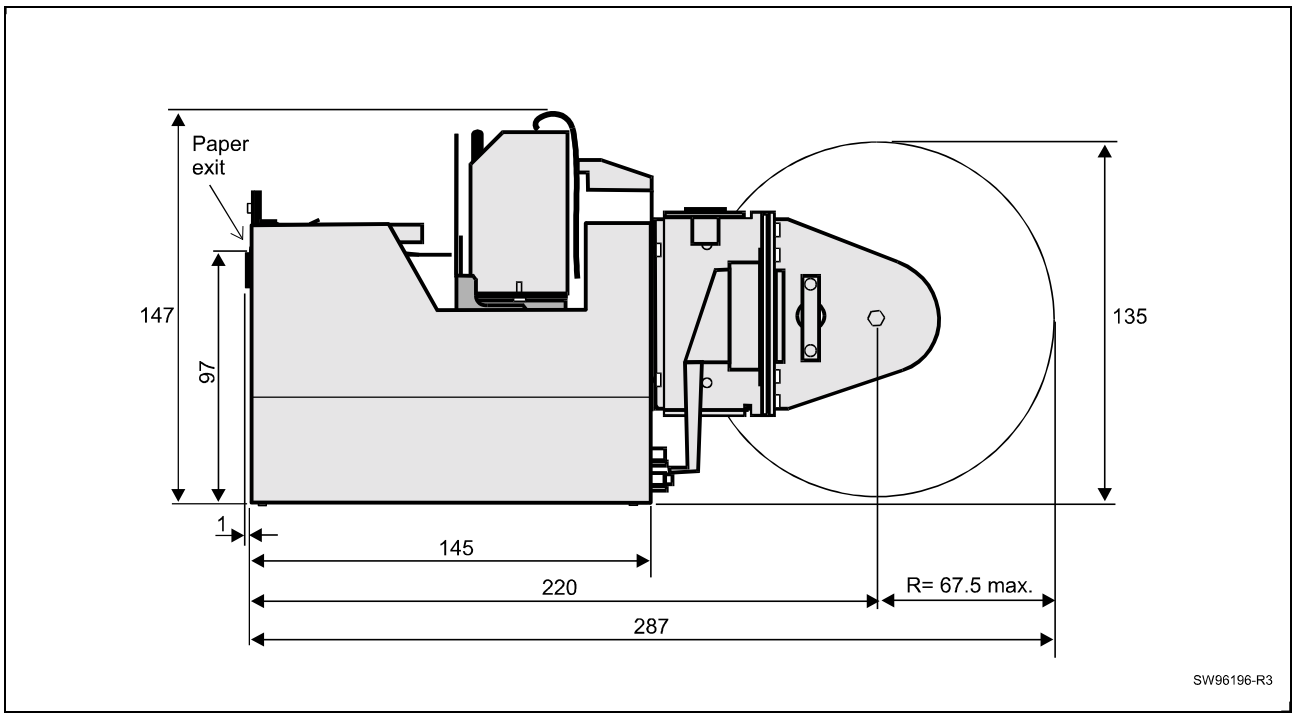
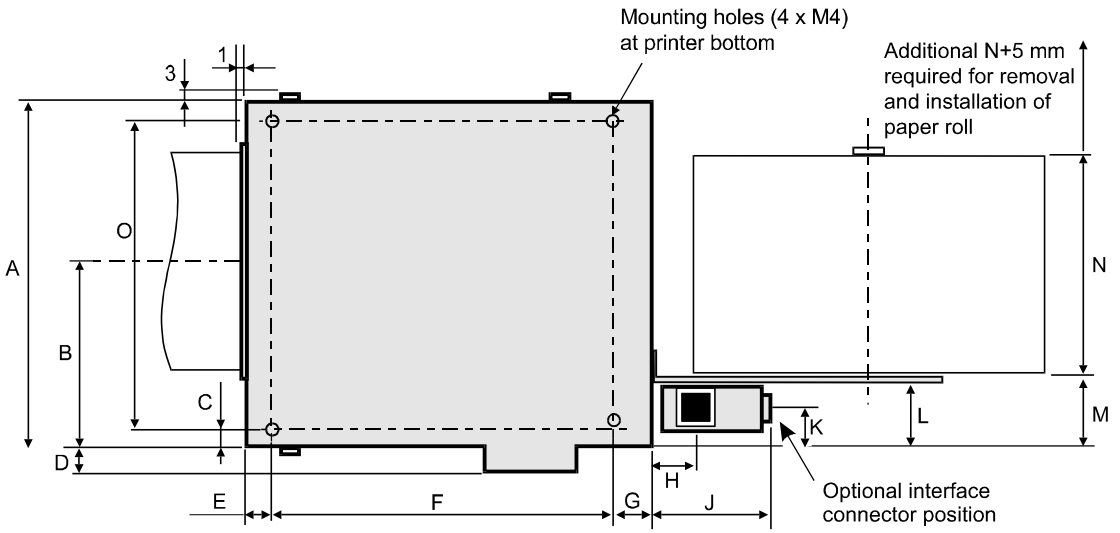


Figure 9. Side view. The dimensions in this drawing apply to all basic TTP 52XX models with up to 135 mm paper roll diameter.

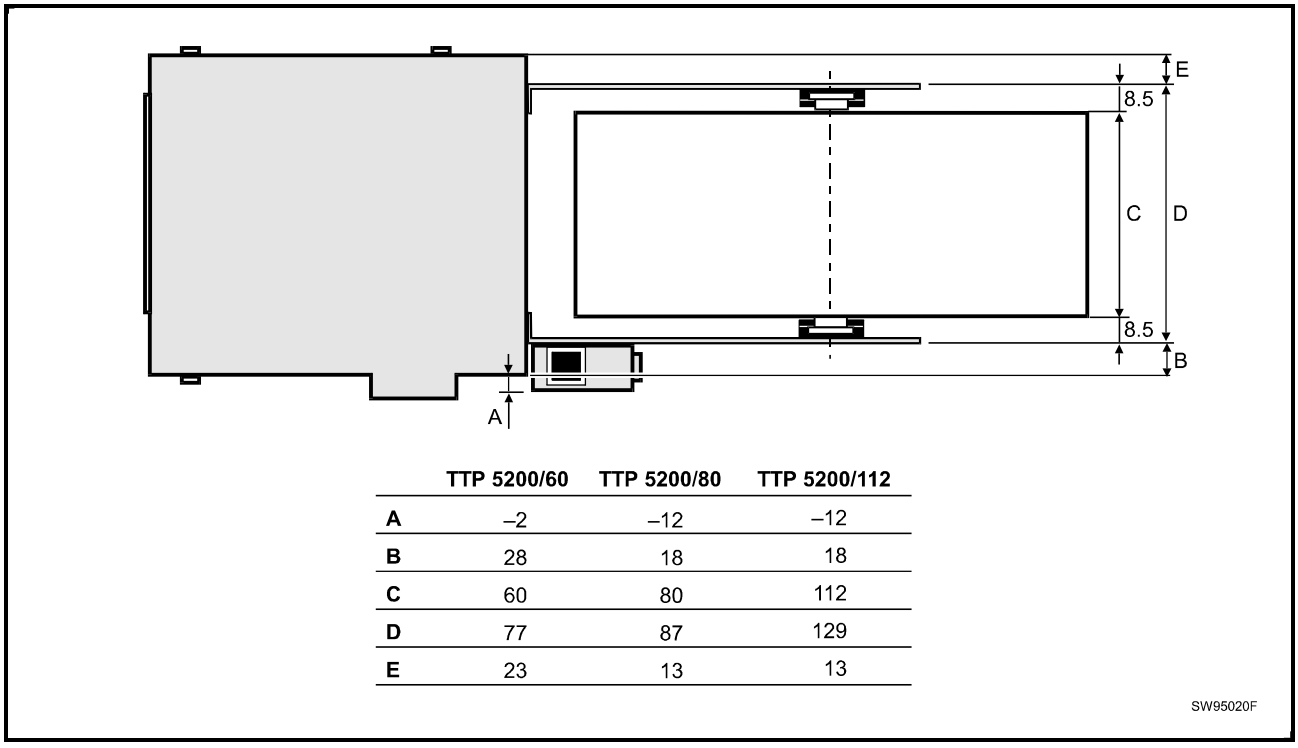


	TTP 5200/60	TTP 5200/80	TTP 5200/112
A	128	128	160
B	67	67	83
C	7	7	16
D	–1	7	7
E	9	9	6
F	120	120	133
G	15	15	6
H	21	21	21
J	58	58	58
K	6	6	6
L	25	25	25
M	37	27	27
N	60	80	112
O	115	115	129

SW96197-R4

Figure 10. Top view. The dimensions in this drawing apply to all basic TTP 52XX models with up to 135 mm paper roll diameter.

The paper roll holder, with attached switch button bracket, can be turned symmetrically 180º so that the roll has to be installed from the right hand side of the printer. This also means that the paper feed button, and the connector support bracket for an optional interface adapter cable, will be positioned on the left hand side of the printer.



	TTP 5200/60	TTP 5200/80	TTP 5200/112
A	–2	–12	–12
B	28	18	18
C	60	80	112
D	77	87	129
E	23	13	13

Figure 11. Top view. TTP 52XX models equipped with the optional paper roll holder for up to 200 mm roll diameter.

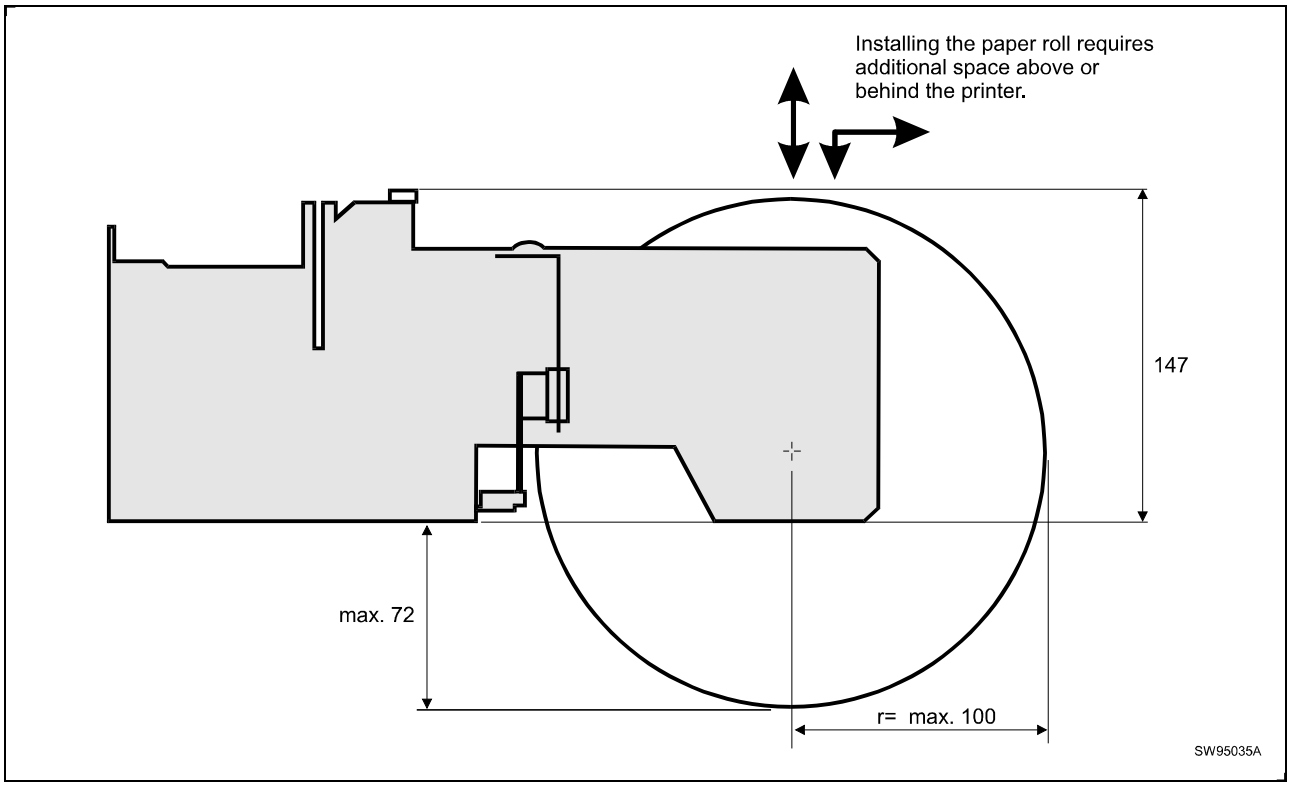


Figure 12. Top view. TTP 52XX models equipped with the optional paper roll holder for up to 200 mm roll diameter.

13 BASIC CHARACTER SET

The table below shows the basic characters stored in PROM on the printer control board. The characters in the shaded positions can be substituted with characters from one of several national character sets. See page 60.

	Hex (1st digit)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. (2nd digit)	Dec. value (horiz. + vert.)	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
0	0	NUL			0	***3***	P	***8***	p	Ç	É	á	▒	└	╨	α	≡
1	1			!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	2			”	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	3	ETX		***1***	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	4			***2***	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	5	ENQ	NAK	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	6	ACK		&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	7			´	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	8		CAN	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	9	HT		)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	·
A	10	LF		*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	11		ESC	+	;	K	***4***	k	***9***	ï	¢	½	╗	╦	█	δ	√
C	12	FF		,	<	L	***5***	l	***10***	î	£	¼	╝	╠	▄	∞	ⁿ
D	13	CR		-	=	M	***6***	m	***11***	ì	¥	¡	╜	═	▌	φ	²
E	14	SO	RS	.	>	N	***7***	n	***12***	Ä	Pt	«	╛	╬	▐	ε	■
F	15	SI		/	?	O	_	o	€	Å	*f*	»	┐	╧	▀	∩	

Character 127 (Δ) was replaced with the Euro character (€) in April 1999. Older TTP 52x0 can be updated with these fonts. The fonts are available for download on www.swecoin.se

14 NATIONAL CHARACTER SETS

This table lists national substitute characters stored in PROM on the printer control board. The position numbers refer to the shaded cells in the table showing the basic character sets. See page 59.

The applicable character set is selected with the ESC+R+n command.

Pos. No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Hex.	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
Dec.	35	36	64	91	92	93	94	96	123	124	125	126
Character set												
1. USA	#	$	@	[	\	]	^	`	{	|	}	~
2. Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3. Great Britain	£	$	@	[	\	]	^	`	{	|	}	~
4. France	#	$	à	°	ç	§	^	`	é	ù	è	¨
5. Spain 1	₧	$	@	¡	Ñ	¿	^	`	"	ñ	}	~
6. Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7. Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
8. Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
9. Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10. Denmark 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11. Spain 2	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
12. Latin America	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
13. Japan	#	$	@	[	¥	]	^	`	{	|	}	~

15 FIRMWARE HISTORY

Functions and features are being added from time to time affecting the firmware in the TTP 52xx printers. The following table lists the changes of general interest.

Notice that the list may not contain the latest firmware versions. Please visit our web site **www.swecoin.se**. for up-to-date information. You can also download the latest firmware version from the Swecoin web site.

Note! *— The TTP 52xx firmware No. 908-xxx is delivered configured for 80 mm paper width. The setup parameter n1 must be changed if other widths are to be used. You may also have to change other parameters to suit your application.* *See page 43.*

FW version	Change
908-200	First released version of the TTP 5200 firmware.
908-210	A build error was made when generating version 908.200 which caused the buffered windows mode fail. Now corrected.
908-220	The presenter feed rolls now feed the paper 2 mm further out after gripping the paper before the front feed rollers stop.
908-230	The extra feed introduced in 220 is removed again. It interferes with the optional shutter.
908-240	The text EXPERIMENTAL VERSION etc on the test receipt was not removed before releasing 230. Fixing this is the only correction in this release.
908-250	Timing problems with baudrate 57600 corrected

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