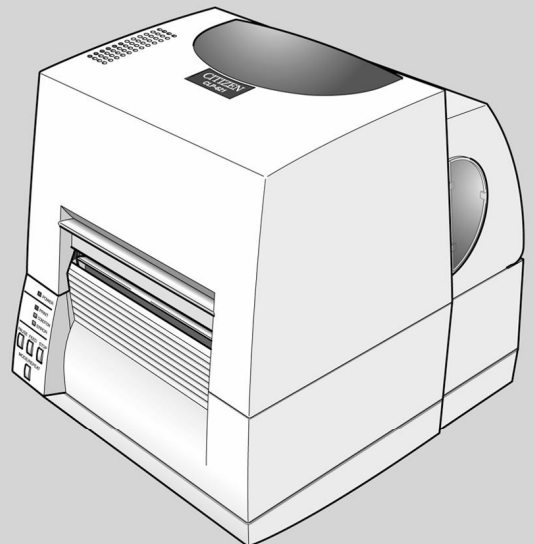


DATECS

PROGRAMMER'S MANUAL

**Detailed Description
of the Commands**

**Direct Thermal
and Thermo Transfer
Barcode & Label Printer
DLP-621**



We wish you a pleasant work
with DLP-621!

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Setting the printing speed		S
Setting the date/hour	*	TS
Setting the date format		TD
Setting the hour format		TT
Disable error and printing reporting	*	UN
Enable error and printing reporting	*	US
Setting the print direction		Z
Setting the paper sensor level (in %)	*	v
Enable/Disable auto calibration	*	a
Paper sensor calibration	*	cal
Setting the printing of condensed text		j
Setting the print method type	*	m
Setting the media type	*	l
Enable/Disable sound		e
Enable/Disable power on head test	*	h
Enable/Disable power on ribbon initialize	*	y
Setting the ribbon end detection time	*	r
Setting the protocol type (for RS-232 interface)	*	p
Setting RS-232 interface speed (bps)	*	s
Setting IP addresses	*	IP
Setting the LAN cable type	*	c
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Factory defaults	*	d

B. Working with counters and variables

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Generating a line of text		A
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Drawing a rectangle in black		LO
Drawing a rectangle in white		LW
Drawing a diagonal line		LS
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Reset printer		^@

H. Print

Printing a label	*	P
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List of Commands by Categories

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I. Information and diagnostics

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Printing out of diagnostic information	*	U
Returning of diagnostic information	*	U@
Info on the occupied memory	*	UM
Returning a list of the loaded forms	*	UF
Returning a list of the loaded graphic files	*	UG
Returning a list of the loaded fonts	*	UE

Note: The commands marked with “*” can not be used when working with a form (command file).

List of Command in Alphabetical Order

Description		Command
Setting values for counters/variables	*	?
Reset printer	*	^@
Generating a line of text		A
Generating a bar code		B
Defining counters		C
Setting the printing density		D
Returning a list of the loaded fonts	*	EI
Deleting a font	*	EK
Loading a font	*	ES
Returning the name of the active form	*	FA
End of a new form	*	FE
Returning a list of the loaded forms	*	FI
Deleting a form	*	FK
Loading a form	*	FR
Start of a new form	*	FS
Drawing out a loaded graphic file		GG
Returning a list of the loaded graphic files	*	GI
Deleting a graphic file	*	GK
Loading a new graphic file	*	GM
Direct printing of graphic data	*	GW
Keeping the counters and variables contents into the Flash memory	*	H
Selecting a code table		I
Setting IP addresses	*	IP
Drawing a rectangle in XOR mode		LE
Drawing a rectangle in black		LO

Drawing a diagonal line		LS
Drawing a rectangle in white		LW
Clearing the flash memory	*	M
De-activating the current form and clearing the graphic buffer	*	N
Printing a label	*	P
Resuming an interrupted printing session	*	PC
Info on an interrupted printing session		PI
Setting the page length		Q
Setting the starting point of the print		R
Setting the printing speed		S
Setting the date/hour	*	TS
Setting the date format		TD
Setting the hour format		TT
Returning the current hour and date		TI
Printing diagnostic information	*	U
Returning of diagnostic information	*	U@
Returning a list of the loaded fonts	*	UE
Returning a list of the loaded forms	*	UF
Returning a list of the loaded graphics	*	UG
Returning data on the engaged and free printer memory	*	UM
Disable error and printing reporting	*	UN
Enable error and printing reporting	*	US
Defining a text variable		V
Deleting the counters and variables content	*	VC
Drawing a frame		X
Setting the print direction		Z
Enable/Disable auto calibration	*	a
Generating a of two-dimension bar code (PDF417)		b
Paper sensor calibration	*	cal
Setting the LAN cable type	*	c
Factory defaults	*	d
Enable/Disable sound		e
Enable/Disable power on head test		h
Setting the printing of condensed text		j
Setting the media type	*	l
Setting the print method type	*	m
Setting the protocol type (for RS-232 interface)	*	p
Setting the page width		q
Setting the ribbon end detection time	*	r

Detailed Description of the Commands

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Setting RS-232 interface speed (bps)	*	s
Setting the paper sensor level (in %)	*	v
Label temporary out		x
Enable/Disable power on ribbon initialize	*	y

Note: The commands marked with '*' can not be used when working with a form (command file).

Detailed Description of the Commands

Category A Setting the functional mode of the printer

(D) Setting the printing density

Description	Offers the option to adjust the printing density depending on the sensitivity of the paper and the character of the printed information.	
Format	Dn	
Parameters	n	Sets the rate of the printing density. Acceptable values are – from 0 to 15. 15 sets the maximum density possible. Setting higher density rates leads to slower printing.
Example	D6 – sets the printing density to 6.	


(I) Selecting a code table

Description	The printer supports 12 tables. The symbols with ASCII codes 0 – 31 there are no images.	
Format	In	
Parameters	n = 0	English (CP437);
	n = 1	Bulgarian (CP856);
	n = 2	Russian (CP866);
	n = 3	Latin2 (CP912);
	n = 4	Baltic (CP775);
	n = 5	Win CE (1250);
	n = 6	Win Cyrillic (1251);
	n = 7	Win Western (1252);

n = 8 Win Baltic (1257);
n = 9 Win Greek (1253);
n = 10 Win Turkish (1254);
n = 11 Win Hebrew (1255).

Example **l1** – selects the Bulgarian set of symbols.

(Q) Setting the page length

Description	<p>When continuous paper rolls are used this command sets the vertical size of the printing area and the automatic space added after it. Both sizes are in dots 8 dots/mm or 203 dot/inch. If there are elements outside of this size when the image is generated they will be cut off.</p> <p>When labels with gaps are used the beginning of the label is determined automatically by printer using movable sensors. Exactly one image can be printed per label. In spite of this the parameters must be within the set limits as quoted below.</p> <p>When labels with black mark on the media backing are used the command sets the label length, the black mark size and the distance between the end of the black mark and beginning of the label.</p>
Format	Qm,[B]n[+p]
Parameters	<p>m The length of the printed area. Possible values – between 80 (10 mm) and 6496 (812 mm);</p> <p>B Non-compulsory parameter – sets the working with a black mark on the back of the label.</p> <p>n The added space after the printout. Possible values – from 0 to 255 (32 mm);</p> <p>p The offset length from the beginning of the label towards the end of the black mark. Integer with sign from -40 to +40. This parameter can be used only for labels with black mark or notches. Otherwise it is ignored by the printer.</p>
Examples	<p>Q240,80 – sets a label length – 30 mm and a distance between the labels – 10 mm.</p> <p>Q240,B40-8 – sets a label length to 30 mm, black mark size – 5 mm and offset length – 1 mm.</p>
	<p> These parameters must be set properly, otherwise the positioning after printing will not be true.</p> <p>If the label size is not set properly the printer may print off the edges of the label and onto the platen roller. Repeated printing off the edges of the label can cause excessive print head wear.</p>

(q) Setting the page width

Description	This command sets the horizontal size of the printing area.	
Format	qm	
Parameters	m	It is the paper width in dots. Possible values – from 80 to 832.
Example	q400 – sets the paper width to 400 dots.	

(R) Setting the starting point of the print

Description	Sets the starting point of the printing area. All graphic object created will have additional offsets on X and Y, depending on the defined offset values. It can be used repeatedly.	
Format	Rm,n	
Parameters	m	It is the horizontal offset. Possible values – from -2047 too +2047.
	n	It is the vertical offset. Possible values – from -2047 to +2047.
Examples	R24,24 – sets an initial offset on X and Y of 3 mm.	

(S) Setting the printing speed

Description	This command is used for selecting the printing speed.	
Format	Sn	
Parameters	n	Sets the desired printing speed. Possible values – from 0 to 4 (approximately 50.0, 62.5, 75.0, 87.5 and 100 mm/sec). At higher density rates the printer may not be able to print at this speed. 0 – 50.0 mm/s; 1 – 62.5 mm/s; 2 – 75.0 mm/s; 3 – 87.5 mm/s; 4 – 100 mm/s.
Example	S4 – the selected printing speed is approximately 100 mm/sec.	

(TS) Setting the date/hour

Description	This command is used to set the real-time clock of the printer.		
Format	TSm,d,y,h,m,s		
Parameters	m	Month	(from 1 to 12);
	d	Day	(from 1 to 31) (validity of the date being checked);
	y	Year – the last two digits	(from 0 to 99);
	h	Hour	(from 0 to 23);
	m	Minutes	(from 0 to 59);
	s	Seconds	(from 0 to 59).
Example	TS12,19,07,11,06,12 – sets clock to 19 December 2007 г. 11:06:12.		

(TD) Setting the date format

Description	This command sets the mode of generating the string for the current day.		
Format	TDxByC		
Parameters	<p>Schematically the date fields are marked with capital letters. A, B and C may have the following values, which may be used not more than once.</p> <p>DD The current day of the month;</p> <p>ME или MN The current month shown in 3 letters or 2 digits;</p> <p>Y2 или Y4 The current year, marked with 2 or 4 digits.</p> <p>The small letters (x, y) mark the spaces between the fields. They are entered together with the symbol which we wish to use. The divisors between the fields are marked in small letters – entered immediately after the symbols we wish to use.</p>		
Examples	<p>TDdd-me-y4 – generates a date of the type 19-DEC-2007</p> <p>TDdd-mn-y2 – generates a date of the type 19-12-07</p> <p>TDdd:me:y4 – generates a date of the type 19:DEC:2007</p>		

(TT) Setting the hour format

Description	This command sets the mode of generating the current hour string.							
Format	TTAxByC							
Parameters	<p>Schematically the date fields are marked with capital letters. A, B and C may have the following values, which may be used not more than once.</p> <table><tr><td>H</td><td>The current hour;</td></tr><tr><td>M</td><td>The current minute;</td></tr><tr><td>S</td><td>The current second.</td></tr></table> <p>The small letters (x, y) mark the spaces between the fields. They are entered together with the symbol which we wish to use. The divisors between the fields are marked in small letters – entered immediately after the symbols we wish to use.</p>		H	The current hour;	M	The current minute;	S	The current second.
H	The current hour;							
M	The current minute;							
S	The current second.							
Examples	<p>TTh:m:s – generates a string of the type 11:06:12</p> <p>TTh-m-s – generates a string of the type 11-06-12.</p>							

(UN) Disable error and printing reporting

Description	This command is used to disable the printer's reporting status when an error was occurred or the label was successfully printed. It is the default printer's status.	
Format	UN	

(US) Enable error and printing reporting

Description	This command is used to enable the printer's reporting status when an error was occurred or the label was successfully printed. It is the default printer's status.	
Format	US[x]	
Parameters	x	<p>A non-compulsory parameter which may have the following values:</p> <p>'0': After successfully completed P or PC command (if no errors occur), the printer will send an ACK (06h) after each label that is successfully printed.</p> <p>If an error occurs, the printer will send a NACK (15h), followed by two bytes of the error number (in decimal code), which may be:</p> <p>01: Syntax Error;</p> <p>02: Duplicate name: Form, Graphic or Soft Font;</p>

03: Name Not Found: Form, Graphic or Soft Font;
04: Insufficient Memory to Store Data;
05: Form Empty;
06: Command Not Allowed;
07: Unknown Error;
08: Paper end;
09: Bad Paper;
10: Ribbon End;
11: Ribbon Feed Error;
12: Head Open;
13: No Calibration;
14: Ribbon Present;
15: RAM Reset;
16: Communication Error;
17: Abnormal motor temperature;
18: Abnormal head temperature;
19: Abnormal head resistance;
'1': After successfully completed **P** or **PC** command (if no errors occur), the printer will send an **ACK (06h)** after each label that is successfully printed.
 If an error occurs, the printer will send a **NACK (15h)**, followed by two bytes of the error number (in decimal code), which value is the same as in parameter '0'.
 If the parameter **x** is absent, the printer accepts **US** command as a command **US0**.

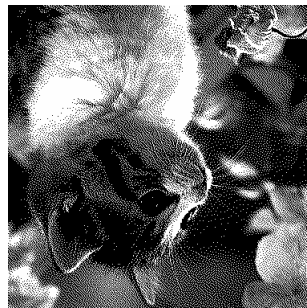
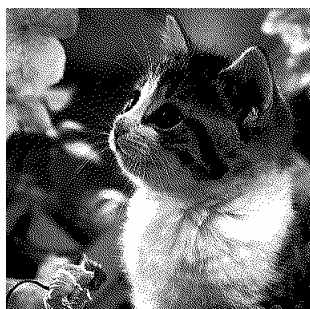
(Z) Setting the print direction

Description Sets the position of the printer during print.

Format **ZT** or **ZB**

ZT Normal image;
ZB Image rotated to 180°.

Example a) Normal image; b) Image rotated to 180°.



(v) Setting the paper sensor level (in %)

Description	This command sets the paper sensor level in %.	
Format	vn	
Parameters	n	Paper sensor level (in %). Possible values are from 0 to 100 . This command can be executed only when the printer auto calibration is disabled.
Example	a- v90 cal	



This command is used only before the printer calibration.
If the printer is not calibrated after changing the paper sensor level, an error **13** will be occurred when a printing command (**P**) is sent.

(a) Enable/Disable auto calibration

Description	The auto calibration means that the printer selects itself the appropriate paper sensor level. If the auto calibration is disabled, in the execution of the calibration command (cal) the printer is trying to do calibration to the current paper sensor level.	
Format	a+ or a-	
	a+	Enable auto calibration;
	a-	Disable auto calibration.

(cal)Paper sensor calibration

Description	<p>The execution of this command leads to the determination of the range in which change the paper sensor indications and the operation threshold, exactly in the middle of this range.</p> <p>Before the execution of this command the right type of paper should be set, because the printer will be calibrated to the paper, which is set.</p> <p>If the auto calibration is enabled, in the execution of the calibration command (cal) an error 13 is occurred. It means that the auto calibration is impossible for this type of paper.</p>	
-------------	--	--

In this case it is necessary to disable the auto calibration (**a-**), to set the paper sensor level, using the command (**v**) and then to execute the calibration command (**cal**) again.

If the auto calibration is disabled and an error **13** is occurred, when the calibration command (**cal**) is executed, it means, that the calibration is impossible for the current paper sensor level. In this case it is necessary to increase the paper sensor level and then to execute the calibration command (**cal**) again.

If a continuous type of paper is set, the printer returns a decimal code - a code of paper, generated by ADC. In other cases it returns two decimal codes, separated by comma. The first of these – noprintable area code and the second – printable area code. Information is transmitted in ASCII format.

Format

cal

After the calibration **is advisable to check** the rightness of working with this type of paper.



Criteria for successful calibration is:

- a)** when pressing the **FEED** button in the presence of paper, the printer moves it properly;
- b)** when pressing the **FEED** button in the absence of paper, an error (**08**) is occurred, that means **no paper**.

If the check failed, it is necessary to make a new calibration.



It is not possible to use the calibration command (**cal**) when working with forms.



The execution of the calibration command (**cal**) leads to write in the printer program memory. Therefore, it should not be used without it being necessary, but only in case of problems.

(j) Setting the printing of condensed text

Description

This command Enables/Disables the printing of condensed text

Format

j0 or **j1**

- j0** Disables the printing of condensed text;
- j1** Enables the printing of condensed text.

(m) Setting the print method type

Description This command sets the print method – direct thermal or thermal transfer.

Format **mR** or **mT**

mR Thermal transfer;
 mT Direct thermal.

(l) Setting the media type

Description This command sets the type of paper used.

Format **IC**, or **IG**, or **IB**, or **IN**

IC Continuous media;
 IG Labels with gaps;
 IB Labels with black mark;
 IN Labels with notches.

(e) Enable/Disable sound

Description This command enables/disables sound.

Format **e+** or **e-**

e+ Enabled sound;
 e- Disabled sound.

(h) Enable/disable power on head test

Description This command is used to check the head temperature and the head resistance on the power on.
 If is an abnormal head temperature, or a bad head resistance the printer signalizes an error (**18** or **19**).

Format **h+** or **h-**

h+ Enabled power on head test;
 h- Disabled power on head test.

(y) Enable/Disable power on ribbon initialize

Description This command is used for initialize ribbon tension, on the power on, when the print method type is thermal transfer.

Format **y+** or **y-**

y+ Enables power on ribbon initialize;

y- Disables power on ribbon initialize.

(r) Setting the ribbon end detection time

Description This command is used for setting the ribbon end detection time.

Format **rQ** or **rN** or **rS**

rQ Quick time error detect;

rN Normal time error detect;

rS Slow time errors detect.

The quick time errors detect is twice less than normal time error detect, and the slow time errors detect is twice higher than normal.

Use this command **(r)** only in one of the following problems:



- a)** when during the printing or feeding the ribbon the printer signalizes an error **11** (ribbon feed error);
- b)** when there is a ribbon, but the printer signalizes an error **10** (ribbon end).

(p) Setting the protocol type (RS232 interface)

Description This command is used to set the protocol type for RS232 interface.

Format **pS** or **pH**
pS Software protocol;
pH Hardware protocol.

(s) Setting RS232 interface speed (in bps)

Description This command is used to set the communication speed (in bps) for RS232 interface

Format **s9600** or
s14400 or
s19200 or
s38400 or
s56000 or
s57600 or
s115200

Example **s115200** – sets communication speed – **115200 bps**.



The printer starts working with the new speed only after restart.

(IP) Setting IP addresses

Description This command is used to set the printer **IP addresses**.

Format **IPPa.b.c.d** Setting printer's **IP** address
IPGa.b.c.d Setting gateway **IP** address
Parameters **a,b,c,d** Numbers **from 0 to 255**, in ASCII format.

Example **IPP192.168.0.50**
IPG192.168.0.2



The printer starts working with the new IP addresses only after restart.

(c) Setting the LAN cable type

Description This command sets the LAN cable type.

Format **cDIRECT** or **cCROSS**
cDIRECT Direct LAN cable is used;
cCROSS Cross LAN cable is used.

(x) Label temporary out

Description This command is used to feed Out the media with 25 mm, after successful execution of the **(P)** command.
This command does easy for access the last printed label.
Before execution the next **(P)** command, the printer process feed IN 2 the media with 25 mm.

Format **x+ or x-**

Parameters **x+** Enable label temporary out;
x- Disable label temporary out.

(d) Factory defaults

Description

This command is used to restore the printer settings to factory defaults:

Printer Speed:	75 mm/s	S2
Printing density:	12	D12
Print Method Type:	Thermal Transfer	mR
Print direction:	Top	ZT
Printing of Condensed Text:	Off	j0
Code Table:	English CP437	l0
Error Reporting:	Off	UN
Media Type:	Labels with gaps	lG
Left Margin:	0	R0,0
Top Margin:	0	R0,0
Label width:	832	q832
Label length:	200	Q200,0
Notch Offset:	0	Qm,n
Black Mark Offset:	0	Qm,n
Continuous Media Gap:	0	Q200,0
Auto calibration:	ON	a+
Power On Check:	ON	h+
Power On Ribbon Init:	OFF	y-
Label Temporary Out:	ON	x+
Buzzer Select:	ON	e+
Ribbon End Detection:	Normal	rN
Date Format:	dd-mn-y2	TDdd-mn-y2
Time Format:	h:m:s	TTh:m:s

Format **d**



This command does not affect the following settings:

RS-232 Baud Rate,
RS-232 Protocol;
IP Addresses;
Cable Connection

The printer is delivered to user with the following factory settings of these:

RS-232 Baud Rate;	9600	s9600
RS-232 Protocol;	Софтуерен	pS
IP addresses;	192.168.0.100	IPP192.168.0.100
	192.168.0.254	IPG192.168.0.254
Cable Connection	Cross cable	cCROSS



If you don't know one of these settings you may enter the **INFO** mode for printing current printer settings (view INFO mode).



The factories settings are stored in battery supplied RAM. On power on the printer checks the content of this RAM. If it is destroyed, the printer automatically executes **d** command and signalizes an error **15**.



The command (**d**) does not affect the calibration data.

Category B Working with counters and variables

(C) Defining counters

Description	This command offers the option to define up to 8 counters, which are whole digit variables, the value of which changes automatically after printing at a previously set rate. Initialization starts with the command '?'. It is used alone or in combination with other variables and counters when generating a text or bar code.
Format	Ca,b,c[d],e,f

Parameters	<p>a Number of the counter – from 0 to 7;</p> <p>b Maximum Length – from 1 to 24;</p> <p>c Alignment. Possible values:</p> <p style="padding-left: 40px;">N – No alignment. The true length is used;</p> <p style="padding-left: 40px;">R – The counter string is right aligned while on the left the maximum length is set joined by the fill-in symbol;</p> <p style="padding-left: 40px;">L – The counter string is left aligned while on the right the maximum length is set joined by the force justify symbol;</p> <p style="padding-left: 40px;">C –The counter string is centered while on the left and right ends to the set length the fill-in symbols are joined;</p> <p>d The additional symbol to the previous argument. If it is not entered a space will be included;</p> <p>e Growth step. This is whole digit with a sign. The counter will automatically change after printing. Possible values – from -100 to +100;</p> <p>f Text prompt. This is a string, closed by inverted commas, not longer than 25 symbols. At the start of the counter the printer will send this text via the serial port.</p>
Example	C0,6,R0,+1,“Counter 1:” defines counter number 0 with a maximum length of 6 bytes, right aligned with zeros, with a step of +1 and a text prompt “Counter 1:” .

(V) Defining a text variable

Description	Offers the option to define up to 32 variables. Initialization starts with ‘?’. It is used alone or in combination with other variables and counters when generating a text or bar code.
Format	Va,b,c[d],e
Parameters	<p>a Number of the variables – from 0 to 31;</p> <p>b Maximum Length – from 1 to 63;</p> <p>c Alignment. Possible values:</p>

Parameters	<p>N – No alignment. The true length is used;</p> <p>R – The string of the variable is right aligned while on the left the maximum length is set joined by the fill-in symbol;</p> <p>L – The string of variable is left aligned while on the right the maximum length is set joined by the force justify symbol;</p> <p>C – The string of variable is centered while on the left and right ends to the set length the fill-in symbols are joined;</p> <p>d The additional symbol to the previous argument. If it is not entered a space will be included;</p> <p>e Text prompt. This is a string, closed by inverted commas, not longer than 25 symbols. At the start of the counter the printer will send this text via the serial port.</p>
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Example **V1,6,L, "Name:"** defines a variable number 1 with a maximum length of 6 bytes, left aligned and with text prompt **"Name:"**.



Text variables are stored in RAM and after switching off the power of the printer (or after executing RESET command) are lost.

(?) Initialization of variables and counters

Description After this command the printer asks for initialization values for the defined counters and variables in the order of their logical numbers. Before each entry the printer sends a text prompt to the computer and it is waiting for a reply about initial counter value. The desired value is entered to the field for sending data and sent to the printer. If a longer string is sent it will cut off from the right end. Empty string will call out the old value of the counter or variable. Initializing a counter with a string, which cannot be interpreted as an integer will be ejected.

Format ?

(VC) Deleting the counters and variables content

Description This command deletes the content of all variables and counters and deactivates them.

Format **VC**

(H) Keeping the counters and variables contents into the Flash Memory

Description This command keeps the variables and counters contents in the **Flash memory**. When **OFF** the printer the contents of **RAM** memory is deleted, including and the contents of variables and counters. To preserve the contents of variables and counters the command **H** should be executed. It causes restoring the state (contents) of variables and counters from **Flash memory** when the printer is **ON**.

Format **H**

Category C Generating of graphic image**(A) Generating a line of text**

Description This command is used for insertion of textual information in the image.

Format **Aa,b,c,d,e,f,g,[*]h**

Parameters

- a** Starting coordinate on X for the upper left angle of the text:
from 0 to 2047;
- b** Starting coordinate on Y for the upper left angle of the text:
from 0 to 7000;
- c** Text orientation: 0=0°, 1=90°, 2=180°, 3=270°. The rotation is clockwise.
- d** Font selection. The following values are possible:
 - 0:** 12x24 dots (bolded)
 - 1:** 8x12 dots
 - 2:** 10x16 dots
 - 3:** 12x20 dots
 - 4:** 14x24 dots
 - 5:** 32x48 dots

d can be a Latin letter.
In this case it is a name of a loadable font.
The size of the symbols are there contained. Around each of the built in fonts there is a white frame 1 dot wide so that the printable size is actually 2 points bigger than the size stated above.
- e** Selecting of a multiplier for X of the font.
Possible values: **from 1 to 8;**
- f** Selecting of a multiplier for Y of the font.
Possible values: **from 1 to 9;**
- g** Printing mode:
 - N** – normal, **R** – inverted, **B** – bolded,
 - W** – inverted bold.

The loadable font can be printed only in a normal mode.

h Text data. The format for generating a text and a bar code is the same and it is described further on.*

Example **A10,10,1,3,2,2,N,“Something”** will create an image of the text “Something” from the coordinate (10,10), rotated to 90° with font 12x20 multiplied times 2 in a horizontal and vertical direction. The text is not inverted.

(B) Generating a bar code

Description This command is used for inserting in bar code in the image.

Format **Ba,b,c,d,e,f,g,h[i],j**

Parameters

- a** Starting coordinate on X for the upper left angle of the bar code: **from 0 to 2047**;
- b** Starting coordinate on Y for the upper left angle of the bar code: **from 0 to 7000**;
- c** Bar code orientation: 0=0°, 1=90°, 2=180°, 3=270°. The rotation is clockwise.
- d** Selecting of the type of bar code for printing: text **from 1 to 3 symbols**. The following values are possible:

String	Bar code Type
3	Code 39
3C	Code 39 with control digit
9	Code 93
0	Code 128 UCC
1	Code 128 – automatic A,B,C mode
K	Codabar
E80	EAN 8
E82	EAN 8 with 2 additional digits
E85	EAN 8 with 5 additional digits
E30	EAN 13
A30	EAN13 with internal control digit
E32	EAN 13 with 2 additional digit
E35	EAN 13 with 5 additional digits
2G	German Postal Code
2	Interleaved 2 of 5 (ITF)
2C	ITF with a control sum for module 10
2D	ITF with a control digit duplicated with text
P	Postnet

1E	UCC / EAN 128
UA0	UPC A
UA2	UPC A with 2 additional digits
UA5	UPC A with 5 additional digits
UE0	UPC E
UE2	UPC E with 2 additional digits
UE5	UPC E with 5 additional digits
2U	UPC interleaved 2 of 5
L	Plessey (MSI-1)

- e** Setting the thickness of the narrow bar in dots.
Possible values: **from 1 to 6**;
- f** Setting the thickness of the wide bar in dots.
Possible values: **from 2 to 10**. The values of this parameter must be bigger than the value of the previous parameter. Some of the bar codes demand additional restrictions.
- g** Height of the bar code in dots.
Possible values: **from 24 to 1000**;
- h** Duplicate info in textual form or not:
N – no, **B** – yes;
- i** A non-compulsory parameter, showing the alignment of the duplicating text in relation to the bar code. It is acceptable only if the previous parameter has a value **B**.
Values: **C** – centered, **R** – right aligned.
By default the text is left aligned;
- j** Data for imaging. The format is similar to the generation of text and bar code and is described further in the text.*
When the bar code functions with a set number of symbols the command will be rejected at an unacceptable symbol. The same is valid in the case of invalid bar code lengths demanding a certain number of symbols.

Example

B0,0,0,E30,2,3,60,B,"1234567890128" will create a bar code image of the EAN13 type with starting coordinate (0,0), not rotated, with bars 2 dots wide, 60 dots high, with a duplicating text with content "1234567890128".



Notice

* Format of the input data for commands A (text) and B (bar code)

Description The input data for the commands A and B is a string, which can be formed by the joining of a free text, the current data and hour as well as some of the defined and initialized counters and variables, in the order and quantity as required by the user. The separate elements are joined together in the order of their description from left to right.

The encoding of the input data is as follows:

Free text: This is entered directly and is closed by inverted commas. If the inverted commas have to find a place in the text it must be preceded by `\'`.

Current data: It is coded with **TD[m]**, where **m** is a non-compulsory whole number from -3600 to 3600 setting the offset size in relation to the current date. Instead of a fixed offset, after this parameter may be the sign "+" and a name of variable. If the variable can be interpreted as a whole number between -3600 and 3600, its value will be used. Otherwise, the current date is printed.

Current hour: Coded with **TT**.

Variable:

Format **Vn[-m/+m][Modifiers]**

Parameters

n	Number of the variable.
m	A non-compulsory whole number from 0 to 10000. If this parameter is available and the appropriate variable can be interpreted as an integer, then its value is added to the value of the variable.
Modifiers	Instructions for separating some of the symbols from the variable. Their number is arbitrary. If they are missing the variables is added as per definition and initialization without additional processing. The printer performs the following modifiers:
<	Cuts off the string all leading symbols which are identical to the symbol following the mark of the modifier. May also be used for cutting off leading zeros or spaces.
>	Cuts off the string end symbols which are identical to the symbol following the mark of the modifier.

Rn	Cuts off the symbols to the left of the n symbol.
Ln	Leaves the last n symbols in the string.
Mm,n	Separates n symbol from the string, starting from the position m .
#	If the string can be interpreted as a whole number cuts off the leading zeros. Puts "0" at the beginning of string, which has a zero length or starting with the symbol ".".
Xmn	Replaces all the symbols in the string that have a value of m with the symbol n .

Counters:

Format	Cn[-m/+m][Modifiers]	
Parameters	n	Logical number of the counter.
	m	A non-compulsory whole number from 0 to 10000. If this parameter is available and the appropriate variable can be interpreted as an integer, then its value is added to the value of the counter.
	Modifiers	Their meaning and functions are the same as with the variables.

The order in which the printer processes the variables and the counters is as follows:

- The present values of the counter/variable is taken as a starting point;
- Its formatting is performed depending on the way it is defined with the command V or C;
- All modifiers are executed from left to right;
- The resulting string is added to the end of the string, resulting from the processing of the previous elements.

Examples **Date: "TD" Time: "TT"** will generate the current date and time.
Date: 02.OCT.2007 Time: 16.30 (for example).

V0><C1L3 will create a string from the variable V0, which is cleared off leading and intervals as well as the left 3 symbols from the counter C1.

V0L1V0M3.2V0R1 will create a string, which will include the first, third, fourth and last symbols of the variable V0.

(LO or LE or LW) Drawing a rectangle

Description	There are three commands designed for this operation: LO draws unconditionally in black, LE inverts the dots, located below the line (in the XOR mode), and LW draws unconditionally in white.
Format	LOa,b,c,d or LEa,b,c,d or LWa,b,c,d
Parameters	a Horizontal start position (X) in dots: from 0 to 2047 ; b Vertical start position (Y) in dots: from 0 to 7000 ; c Size on X: from 1 to 2047 ; d Size on Y: from 1 to 7000 .
Example	LO10,10,100,200 Draws a rectangle with coordinates (10, 10), (110, 10), (110, 210) and (10, 210) in black.

(LS) Drawing a diagonal line

Description	The command is used for drawing a diagonal line with a set line thickness.
Format	LS[m]a,b,c,d,e
Parameters	m Non-compulsory parameter. Values: E –XOR mode, W – drawing in white; a Horizontal start position (X) in dots: from 0 to 2047 ; b Vertical start position (Y) in dots: from 0 to 7000 ; c Line thickness: from 1 to 80 ; d Horizontal end position (X) in dots: from 0 to 2047 ; e Vertical end position (Y) in dots: from 0 to 7000 ;
Example	LSE10,10,8,100,200 – draws a line from coordinate (10,10) to (100,200), 8 dots thick, which inverts the image over which it runs.

(X) Drawing a frame

Description	This command generates a rectangular frame with a set line thickness.
Format	Xa,b,c,d,e
Parameters	a Horizontal start position (X) in dots: from 0 to 2047 ; b Vertical start position (Y) in dots: from 0 to 7000 ; c Frame thickness: from 1 to 80 . Thickness is at expense of the inner area. d Horizontal end position (X) in dots: from 0 to 2047 ; e Vertical end position (Y) in dots: from 0 to 7000 ;
Example	X10,10,3,360,250 – draws a rectangular frame with a size of 350x240 dots and frame thickness of 3 dots.

(b) Generating a two-dimension bar code (PDF417)

Description This command generates a two-dimension bar code. It supports PDF417 only.

Format **bp₁,p₂,p₃,p₄,p₅[,p_i...],“Data”**

Parameters

p₁ X coordinate of the upper left angle:
from 0 to 2047;

p₂ Y coordinate of the upper left angle:
from 0 to 7000;

p₃ Sets the type of the bar code. It must be ‘P’ for PDF417. MacroPDF и ECI (Extended Channel Interpretation) are not supported;

p₄ Maximum print width in dots:
from 0 to 608;


p₅ Maximum print height in dots:
from 0 to 1024.

The following parameters may be omitted.

Default values will automatically be inserted. Each parameter value must be preceded by its associated command prefix character, as follows:

p₆ (s) Sets errors correction level (ECL).
Possible values: **from s0 to s8**.
If level is not specified, it will automatically be assigned as per the following table:

Number of code words (data)	ECL	ECL code word
–	0	2
1 – 31	1	4
32 – 63	2	8
64 – 127	3	16
128 – 255	4	32
256 – 511	5	64
512 – 928	6	128
–	7	256
–	8	512

- p₇ (c)** Selects data compression method.
c0 – automatically (default setting);
c1 – binary mode (byte compaction);
- p₈ (p)** Prints duplicate text (human readable). This parameter is a non-standard implementer of PDF417 and is only recommended for troubleshooting purposes.
Format: **px,y,n**
x – horizontal start position (X): **from 0 to 2047**;
y – vertical start position (Y): **from 0 to 4095**;
n – number of symbols per line: **from 1 to 40**.
- p₉ (f)** Bar code positioning.
f0 – **p₁** and **p₂** coordinates are used;
f1 – the bar code is centered in the rectangle, set by **p₁**, **p₂**, **p₄** and **p₅**.
This is the default value;
- p₁₀ (x)** Maximum module (line/row) width in dots.
Values: **from x2 to x9**.
Default: **x6**.
- p₁₁ (y)** Maximum bar height in dots.
Values: **from y4 to y99**.
Default: **4*p₁₀**;
- p₁₂ (r)** Maximum number of lines (rows). Values: **from r3 to r90**.
Default value: **r90**;
- p₁₃ (l)** Maximum column number. Values: **from l5 to l34**.
Default: **l34**;
- p₁₄ (o)** Bar code orientation:
o0=0°, o1=90°, o2=180°, o3=270°.
The rotation is clockwise;
- Data** Data for printing. Their format is similar to the generation of text and bar code (described above in the text.*), but additionally may be entered control symbols, (which ASCII code is less than 32) by syntax '**\dd**', where **dd** is ASCII code of the symbol in decimal.
-  If the line (row) width and line height are set so, that the bar code can not fit into the rectangle, set by **p₁**, **p₂**, **p₄** and **p₅**, the printer automatically reduces the sizes **p₁₀** and **p₁₁** so, that it may be printed. The number of rows and columns are automatically calculated so that the proportions of the bar are as close as possible to **p₄:p₅** and the line width/height ratio is optimal for reading it. If after reducing the sizes the bar code can not be fit into the rectangle it will not be printed.

Example **b0,0,P,320,100,f0, "DATECS Ltd.\10www.datecs.bg\10"**
 will print a bar code PDF417, containing data:
DATECS Ltd.<LF>www.datecs.bg<LF>

The coordinates of the upper left angle of the bar code are (0,0). The printer starts from the default line width (6), then it reduces the size until it becomes enough to print. As a result the bar code has 9 columns and 5 lines in a line width of 2 dots. The error correction level is automatically set to 1 (4 – ECL code word). Working in automatic data compression mode.

Category D Working with form

(FS) Start of a new form

Description	This command starts the entry of a new form in the user's memory of the printer. All valid commands which are sent to the printer between this command and the command FE will be saved in this form. If any of the commands is rejected due to syntax error or because it has not been accepted in a form, it will not be saved. If there is a previous form with this name it must be deleted FK command , otherwise the command will be rejected.
Format	FS"Name"
Parameters	Name Form name, up to 8 symbols . All symbols with ASCII codes between 32 and 127 (including) are acceptable, without the symbol '*'. Small and capital letters are not distinguished so that "Test" and "TEST" are one and the same form.
Example	FS"Test"

(FE) End of a new form

Description	The command puts an end to the saving of the form it is registered in the list of forms and is ready for loading and execution. If before executing the command FE the printer is switched OFF the information from the form entered so far is lost and the memory space it has covered is set free. If no saving of a form is started the command will be rejected.
Format	FE

(FR) Loading a form

Description	The command announces the information entered earlier as active. From this point the form will be executed automatically at each command for printing. If other commands have also been dispatched to the printer the printed label will be the joint result of the execution of all commands related to the form. The closing of the activity of the form comes when a new form is loaded or with the commands M or N . Of course, the result will be the same when the form is deleted.
Format	FR"Name"
Parameters	Name Name of the form. A form with this name must be loaded into the memory.
Example	FR"Test"

(FK) Deleting a form

Description	The command deletes existing form or all forms. The engaged memory after this is freed.
Format	FK"Name"
Parameters	Name Name of the form. A form with this name must be saved in the memory. If "" is entered as a name all forms will be deleted.

(FA) Returning the name of the active form

Description	Returns the name of the active form.
Format	FA

(FI) Returning a list of the loaded form

Description	This command returns a list of all loaded forms or the content of one of them.
Format	FI – returns a list of all loaded forms; FI"Name" – returns the content of the form with specified in the command name.
Parameters	Name Name of the form. A form with this name should exist.

Category E Working with graphic files (monochrome PCX format)
(GM) Saving a new graphic file

Description Saves a new graphic file in the memory of the printer. The rules concerning names are the same as with the forms. The command will be rejected if there is already a graphic file with that name or requested file size is greater than the free user memory. The file must be in The file should be in monochrome bitmap PCX format. Otherwise it will not be loaded. Файлът трябва да бъде монохромен bitmap PCX формат. It may be produced by various programs under Windows, such as **Adobe Photoshop** (for example).

Format **GM“Name”,n**

Parameters **Name** The name under which the graphic file will be saved in the printer memory.
n File length – no more than 32768 bytes.



After the command the set quantity of bytes must be sent to the printer.

Example **GM“Logo1”,3530** – saves a graphic file under the name “LOGO1”, with a length of 3530 bytes.

(GG) Drawing out a loaded graphic file

Description This command starts printing of a graphic file that has been previously stored in the printer buffer.

Format **GGa,b,“Name”**

Parameters **a** X coordinate of the upper left corner of the graphic image:
from 0 to 2047;
b Y coordinate of the upper left corner of the graphic image:
from 0 to 7000;
Name Graphic file name.

Example **GG20,150,“Logo1”** – draws out into the graphic buffer a graphic file with starting coordinates (20, 150) and loaded under the name “Logo1”.

(GW) Direct printing of graphic data

Description This command is used to load binary graphic data directly into the image buffer for immediate printing. The printer does not store graphic data sent directly to the image buffer.

Format **GW**

(GK) Deleting a graphic file

Description	The command deletes an existing graphic file or all graphic files. After deletion the engaged memory is freed.
Format	GK "Name"
Parameters	Name Graphic file name. A file with this name must be saved into the memory. If "*" is entered as a name all graphic files will be deleted.

(GI) Returning a list of the loaded graphic files

Description	Returns a list of the loaded graphic file.
Format	GI

Category F Working with loadable fonts

(ES) Loading a font

Description	The command is used for loading additional fonts in the printer. The loadable fonts may contain from 1 to 256 symbols, not necessary arranged in a fixed order. You can create own fonts using the syntax of the command, described further on or you may use ready programs for this purpose – for example, Soft Font Downloader Utility.
Format	ES "Name" p₁p₂p₃a₁b₁c₁D₁a₂b₂c₂D₂ ... a_nb_nc_nD_n
Parameters	<p>Name Font name – a Latin letter.</p> <p>p₁ One byte – The number of symbols of the font. Possible value: from 0 to 255, this corresponds to 1–256 symbols.</p> <p>p₂ One byte – Rotation of the font. Only a value 00h is possible (not rotated);</p> <p>p₃ One byte – the height of the font in dots. From 1 to 255;</p> <p>a_j One byte – ASCII code of the <i>j</i> loaded symbol. From 0 to 255.</p> <p>b_j One byte – distance to the next symbol in dots. From 0 to 255.</p> <p>c_j One byte – width of the <i>j</i> loaded symbol in unit of 8 dots each. From 0 to 255.</p> <p>D_j Data for the <i>j</i> symbol. (p₃ * c_j) bytes arranged in the order line by line from left to right where each byte corresponds to a dot. "1" is black dots.</p>

(EK) Deleting a font

Description	The command deletes an existing loadable font or all fonts. The engaged memory is freed.
Format	EK “Name”
Parameters	Name Font name. A string which consists of only one letter, which must be found in the memory of the printer. If as a name “*” is entered all loadable fonts will be deleted.



If the font that is present in a form has been deleted, it is not printed. When reloading the font should be loaded with the same name.

(EI) Returning a list of the loaded fonts

Description	Returns a list of the loaded fonts.
Format	EI

Category G	Clearing the memory
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(M) Clearing the flash memory

Description	The command leads to the deletion of the whole information loaded into the user's (flash) memory of the printer, including forms, graphics and fonts. All adjustment to the printer, accessible via commands acquires their default values.
Format	M

(N) De-activating the current form and clearing the graphic buffer

Description	The command clears the memory where the image for printing is generated and places the printer in the mode "working without active forms". The command may be used after an error when there are suspicions that the graphic buffer has not been cleared or if we wish to generate an image directly via commands and without using forms.
Format	N

(^@) Reset printer

Description	The command emulates Power Off and then Power On of the printer. Thus reinitializing the printer.
Format	^@

Category H Print

(P) Printing a label

Description	The command causes the printing out of the content of the printer's graphic buffer. After the completion of this action it is not cleared.
Format	P[m,n]
Parameters	<p>m The number of identical labels which will be printed out. The entering of a value greater than 1 as an option when working with a form, which uses counters. After printing a certain number of labels the counters automatically change their values according to the rules set when they were defined and the new group of labels is printed with the new values. Possible value: from 1 to 1000.</p> <p>n The number of absolutely identical labels for print. Брой абсолютно еднакви етикети, които ще бъдат отпечатани. Possible value: from 1 to 1000.</p>



The sum quantity for this command will be **m*n**.

The command with only one parameter is used for printing a label resulting from command, directly sent to the printer. The active form is ignored. The parameter indicates the number of identical label demanded.

Example	P2,3 – the command will print 6 labels, the second 3 of each will have new counter values.
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(PC) Resuming an interrupted printing session

Description	If the last printing command has been completed successfully the command will active no action on the printer. But If the last printing session has been interrupted you may activate it's continuation from the point of interruption in order to get the required number of labels.
Format	PC



This command can be executed when the printer status is ready to print (LED PRINT lights in green).

Category I	Information and diagnostic
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(PI) Info on an interrupted printing session

Description	<p>This command activates the returning via the serial port a line with the following content::</p> <p>a,b,c where:</p> <p>a – this is the number of label groups, which are not printed (the remainder of the first parameter m of the command Pm,n). If this parameter is 0, the last print is completed;</p> <p>b – it is the number of copies of the current group, that have not been printed (the remainder of the second parameter n of the command Pm,n). If this parameter is 0, the last print is completed;</p> <p>c – it is the number of copies in the group for the last print command (n is the second parameter of the command Pm, n).</p> <p>The command allows calculating the number of labels which have not been printed in the last print.</p> <p>The formula is:</p> $N = (a-1)*c + b$ <p>If a is different from zero, the N is the number of labels that should be printed when executing the command PC.</p>
Format	PI

(TI) Returning the current hour and date

Description	This command returns the current hour and date.
Format	TI

Returning date format	dd-mn-y4 h:m:s
Example	TI will generate a string of the type 19-12-2007 11:06:12

(U) Printing out of diagnostic information

Description	<p>This command causes the printing out of data on the status of the printing head, the printer model, available free memory, and the baud rate of the serial interface and the values of the current printer settings.</p>
Format	U

(U@) Returning of diagnostic information

Description	This command causes the returning of data on the status of the printing head, the printer model, available free memory, and the baud rate of the serial interface and the values of the current printer settings.
Format	U@

(UM) Returning data on the engaged and free printer memory

Description	<p>This command activates the returning via the serial port a line with the following content::</p> <p>a,b,c where:</p> <p>a – is the memory, engaged with forms, presented in bytes;</p> <p>b – is the memory, engaged with graphics, presented in bytes;</p> <p>c – is the memory, engaged with fonts, presented in bytes;</p> <p>d – is the free memory in bytes.</p>
Format	UM

(UF or FI“Name”) Returning a list of the loaded forms

Description	<p>The first form of the command returns a list of the loaded forms in the printer memory, which has the following structure:</p> <p>n – is the number of the loaded forms: 3 digits;</p> <p>Form₁ – is the name of the first form: from 1 to 8 symbols;</p> <p>...</p> <p>Form_n – it is the name of the n form.</p> <p>Each element of the above structure ends in <CR><LF>.</p> <p>The second form of the command permits the printer to deliver the content of the form under the entered name. The form must be loaded there in advance. The data is sent line-by-line, being divided by the combination <CR><LF>.</p> <p>After the last line one byte is sent with the ASCII code 00h.</p>
Format	UF or FI“Name”

(UG or GI“Name”) Returning a list of the loaded graphics

Description The first form of the command returns a list of the graphics, loaded in the printer. It has the following structure:

n – it is the overall number of loaded graphics: **3 digits**;

Gr₁ – it is the name of the first graphic: **from 1 to 8 symbols**;

...

Gr_n – it is the name of the **n** graphic image.

Each element of the above structure ends in **<CR><LF>**.

The second form of the command permits the printer to deliver the content of the graphic under the entered name. The graphic must be loaded there in advance.

The data is sent in the following format:

n₁n₂D where:

n₁ – it is the elder ranking part of the total number of bytes in the image;

n₂ – it is the junior ranking part of the bytes,
i.e. **(n₁*256+n₂)**;

D – graphic image data in a binary form.
The number is defined by **n₁** и **n₂**.
The format is monochrome PCX.

Format **UG** or **GI“Name”**

(UE or EI“Name”) Returning a list of the loaded fonts

Description	<p>The first form of the command returns a list of the loaded fonts in the printer memory, which has the following structure:</p> <p>n – it is the total number of the loaded fonts: 3 digits;</p> <p>Font₁ – it is the name of the first font: 1 symbol;</p> <p>...</p> <p>Font_n – it is the name of the n font.</p> <p>Each element of the above structure ends in <CR><LF>.</p> <p>The second form of the command permits to call from the printer a selected font with the given name. The font must be stored there in advance. The data is sent in the following format:</p> <p>n₁n₂p₁p₂p₃a₁b₁c₁...a_nb_nc_n where:</p> <p>n₁ – it is the elder ranking part of the total number of bytes in the font;</p> <p>n₂ – it is the junior ranking part of the total number of bytes, i.e. (n₁*256+n₂);</p> <p>p₁ – one byte – the number of symbols of the font.</p> <p>p₂ – one byte – rotation of the font. Only a value 00h is possible (not rotated);</p> <p>p₃ – one byte – the height of the font in dots.</p> <p>a_j – one byte – ASCII code of the j loaded symbol.</p> <p>b_j – one byte – distance to the next symbol in dots.</p> <p>c_j – one byte – width of the the j loaded symbol in unit of 8 dots each;</p> <p>D_j – Data for the j symbol. (p₃ * c_j) bytes arranged in the order line by line from left to right</p>
Format	UE or EI“Name”

List of ESCAPE commands

ESC B

Description	This command clears the image buffer and positions the cursor in the start position.
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ESC D x or ESC D xx

Description	This command sets the printer density. Possible values: from 0 to 15 .	
Parameter	x	One digit.
	xx	Two digits number.

ESC G xx b₁ ... b_{xx}

Description	This command copies to the graphic buffer the content of one graphic line.	
Parameter	xx	Two digits number (in text format), which shows the amount of the bytes, that will be copied in the graphic buffer.
	b	Graphic data.

After executing of this command the cursor automatically returns to the start position of the next graphic line.

ESC g xxx b₁ ... b_{xxx}

Description	This command copies to the graphic buffer the content of one graphic line.	
Parameter	xxx	Three digits number (in text format), which shows the amount of the bytes, that will be copied in the graphic buffer.
	b	Graphic data.



For DLP-621 maximum length of a graphic line is 104 bytes. If the printer receives a row in length, more than 104 bytes in graphic buffer will be copied only the first 104 of them and the rest will be ignored.

After executing of this command the cursor automatically returns to the start position of the next graphic line.

ESC P xx

Description	This command causes the printing of the content of the graphic buffer.	
Parameters	xx	Two digits number, which corresponds to the number of sets of identical labels, which will be printed by the printer.

List of ESCAPE Commands

DATECS DLP-621

ESC S x

Description	This command sets the printing speed. Possible values – от 0 до 4.
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ESC X

Description	The command causes the label temporary out. This command does easy for access the last printed label.
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