User's Manual

LABEL PRINTER

Model: LP-50

LP-50-2011-08

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IMPORTANT SAFETY INSTRUCTIONS

- Read all of these instructions and save them for future reference.
- Follow all warnings and instructions marked on the product.
- Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
- Do not use this product near water.
- Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.
- Slots and openings on the back or cover these openings. The openings should never be blocked by placing the product on a bed, sofa, rug of other similar surface.
- This product should never be placed near or over a radiator or heater.
- This product should not be placed in an built-in installation unless proper ventilation is provided.
- This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not place this product where the cord will be walked on.
- If an extension cord is used with this product, make sure that the total of the ampere ratings of the products plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

- Except as explained elsewhere in this manual, do not attempt to service this product by yourself. Opening and removing the covers that are marked.
- "Do Not Remove" may expose you to dangerous voltage points or other risks.
- Refer all servicing on those compartments service to service personnel.
- Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  A. When the power cord or plug is damaged or frayed.
  B. If liquid has been spilled into the product.
  C. If the product has been exposed to rain or water.
  D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered be the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
  E. If the product has been dropped or the cabinet has been damaged.
  F. If the product exhibits a distinct change in performance, indicating a need for service.
- Please keep the poly bag which this equipment is packed in away from children or throw it away from children or throw it away to prevent children from putting it on. Putting it on may cause suffocation.

CAUTIONS

- Prior to using the equipment, be sure to read this User's Manual thoroughly. Please keep it handy for reference whenever it may be needed.
- The information contained herein may be changed without prior notice.
- Reproduction of part or all of this User's Manual without permission is strictly prohibited.
- Never service, disassemble, or repair parts that are not mentioned in this User's Manual.
- Note that we will not be responsible for damages attributable to a user's incorrect operation/handling or an improper operating environment .
- Operate the equipment only as described in this User's Manual; otherwise accidents or problems may result.
- Data are basically temporaty; they cannot be stored or saved permanently or for a long time. Please note that we will not be responsible for damages or sses of profit resulting from losses of the data attributable to accidents, repairs, tests, and so on.
- If you have any questions or notice any clerical errors or omissions regarding the information in this manual, please contact our office.
- Please note that, notwithstanding them 8 above, we will not be responsible for any effects resulting from operation of the equipment.

SAFETY PRECAUTIONS – BE SURE TO OBSERVE

In order to prevent hazards to an operator or other persons and damage to property, be sure to observe the following precautions.

- The following describes the degrees of hazards and damages that can occur if the given instructions are neglected or the printer is incorrectly operated.

⚠ WARNING

Negligence of this precaution may result in death or serious injury.

⚠ CAUTION

Negligence of this precaution may result in injury or damage to property.

⚠ This is an illustration mark used to alert your attention.

⚠ This is an illustration mark used to indicate such information as an instruction or the like.

⚠ WARNING

- Never handle the equipment in the following manners, as it may break, become out of order, or overheat causing smoke and resulting in fire or electric shock. If the equip ment is used in an abnormal condition, such as when broken, then problems, smoke emission, abnormal odor/noise, and fire can result. If an abnormal condition exists, be sure to disconnect the power plug from a plug socket, and contact our dealer. Never repair the equipment on your own – it is very dangerous.
- Do not allow the equipment to receive a strong impact or shock, such as kicking, stamping, hitting, dropping, and the like.
- Install the equipment in a well-ventilated place. Do not use it in such a manner that its ventilation port will be blocked.
- Do not install the equipment in a place like a laboratory where chemical reactions are expected, or in a place where salt or gases are contained in the air.
- Do not connect/disconnect a power cord or a data cable, while holding the cable.
- Do not pull, install, use, or carry the equipment in such a manner that force will be applied to the cables.
- Do not drop or insert any foreign substances, such as clips or pins, into the equipment.
- Do not spill any liquid or spray any chemical-containing liquid over the equipment. If any liquid is spilled on it, turn off power, disconnect the power cable and power cord from the plug socket, and contract our dealer.
- Never disassemble or remodel the equipment. Negligence of this may cause fire or electric shock.
- Use the equipment only with the specified commercial power supply and AC adapter. Negligence of this may result in fire, electric shock, or problems.
- If you drop or break the AC adapter, or if water or the like gets inside it, unplug it immediately from the socket and contact your dealer.
- Do not damage, break, process, bend/pull by force, twist, or head an AC adapter cord. Also, do not put a heavy substance on it or heat it. The AC adapter cord could be

broken, resulting in fire, electric shock, or trouble. If the AC adapter cord is damaged, contact our dealer.

- Do not connect/disconnect the AC adapter with wet hands.
- Do not overload a single electrical outlet, using a table tap or a current tap socket.
- An equipment packing bag must be discarded or kept away from children. A child can suffocate if the bag is placed over the head.

⚠ PRECAUTIONS FOR INSTALLATION

- Do not use or store the equipment in a place exposed to fire, moisture, or direct sunshine, or in a place near a heater or thermal device where the prescribed operating temperature and humidity are not met, or in a place exposed to much oil, iron powder, or dust. The equipment may become out of order, emit smoke, or catch fire.
- Do not install or use the equipment in a place like a laboratory where chemical reactions are expected, or in a place where salt or gases are contained in the air. There is a danger of fire or electric shock.
- Install the printer on a flat, stable desk or table that is free from vibration, in a well-ventilated place.
- Do not install the printer at a location where its operation could be hindered.
- Do not place anything on the printer or leave small objects, like a clip or pin, around it. A foreign object could cause trouble if it gets inside.
- Do not use any sharp-pointed object, such as a pen, for example, to touch the operation panel of the printer. It could cause trouble.
- Do not use the equipment near a radio or TV receiver. Do not share the power from a plug socket a radio or TV receiver is connected to. It may cause a reception problem.
- Use the equipment only at the specified power supply, voltage and frequency. Otherwise, it may emit smoke and catch fire or cause other problems.

- Connect only the specified power source. Use of an unspecified power source could cause trouble or smoke/fire.
- Confirm that a plug socket used for connection has sufficient capacity.
- Avoid connecting a power cable to a plug socket shared by other devices or extending the wiring too far. It may result in the cable catching fire or a power outage. Also, do not step on or apply an excessive force (Pull, Load) to the cable, and do not use the printer with such a force applied to it.
- Never connect a grounding cable (Frame ground) to a gas pipe. There is a danger of explosion. When connecting or disconnecting the grounding cable,be sure to disconnect the power cable and the power plug from the plug socket.
- When connecting/disconnecting the cables, be sure to turn off the power first, including the connected side, and then connect/disconnect them, holding a plug and a connector. Pulling the cable itself could cause it to snap or become damaged.
- Connect a power cable or a connector cable securely. If a reverse-polarity connection is a made, internal elements may be broken or a mating device may be ad versely affected.
- Use a shielding wire or twisted pair wire for a signal line, in order to minimize noise effect. Do not route the cable too long or connect it to a noisy device. Connection to a noisy device could cause erroneous printing due to corrupt data, and so on.
- Use the equipment in an environment where there is s plug socket near the main body and you can easily disconnect the power plug from it, to shut off the power.
- When the equipment will not be used for a long period of time, unplug it and remove the paper roll from it.
- When transporting the equipment, remove the paper roll from paper holder.

⚠ PRECAUTIONS FOR HANDLING

- Do not handle the equipment in the following manners, because problems may result.
- Do not use any other power source besides the accessory AC adapter. Also, do not use the AC adapter for other purposes.
- Do not print without paper.
- Do not drop or put any foreign object, such as a clip, pin, or the like, inside the printer.
- Do not spill any liquid or spray any chemical-containing liquid over the equipment.
- Never use a pointed object, such as a pen, to operate the operation panel.
- Do not use Scotch tape to fasten paper together for continuous use. It could damage the printing head.
- Never pull the set paper forcibly. When opening/closing the printer cover, take care that the paper will not be caught. It could cause the paper to jam.
- Be sure to use the specified paper. Use of other paper could deteriorate the print quality or cause a problem with the printing head.

To Prevent and Spreading of Damage

- Never touch the printing head motor, or paper cutting blade. Your finger may be cut.
- During power-on or immediately after printing, do not touch electrical parts or moving parts, such as the mechanism, motor, internal dear, etc. They may be very hot and can burn your hand/finger.
- Be careful to avoid bodily injure or damaging other objects with an edge of sheet metal.
- Should any error occur while operating the equipment, stop it immediately and disconnect the power plug from the plug socket.
- Only a qualified serviceman is allowed to disassemble or repair the printer.

- Should a problem occur, leave solving it to our serviceman. Do not disassemble the equipment on your own.
- When opening/closing the printer cover, and so on, be careful not to catch your hand or finger on the equipment.
- After using the equipment, turn off the power switch and unplug the AC adapter from a plug socket.

⚠ DAILY MAINTENANCE

- At the time of maintenance, be sure to turn off the power switch of the printer and unplug it from the socket.
- Use a dry soft cloth to wipe off stains and dust from the surfaces of the main body case. For severe soiling, dip the cloth in water and wring it, for wiping offthe soil. Never use organic solvents, such as alcohol, thinner, trichlene, benzene, ketone, or chemical dusters.
- If the equipment is contaminated with paper powder, use a soft brush to clean it. Be careful not to damage the printing head.
- Cleaning the Printing Head
  1. Referring to "4.5 Removing Paper Jam", detach the platen roller unit.
  2. Moisten gauze slightly with alcohol, and clean the heating surface of the printing head with it.
  3. Reattach the platen roller unit.

⚠ CAUTION

The printing head and motor are very hot. Be careful not to touch them immediately after printing. Do not touch the heating surface of the head with a bare hand or metal. When detaching or reattaching the platen roller unit, be sure to raise up the printing head, otherwise, they could be damaged. Handle the detached platen roller unit carefully so as not to damage it.

1. OUTLINE

This LP-50 is a compact-sized, label thermal printer is designed for various types of data communication terminals and measuring instrument terminals. Its abundant built-in features allow you to widely use this printer for different applications. Prior to using it, read and understand this manual thoroughly.

1.1 Features

It can be used in variety of applications because:

1. Small, lightweight and installable in a narrow area
2. High speed and low noise, owing to line thermal print
3. Long-life printing head and high reliability, owing to the simple mechanism
4. Easy paper/label-loading, owing to the auto-loading function
5. Built-in input buffer
6. Capable of printing a bar code

1.2 Unpacking

When unpacking the package, confirm that the following parts are provided:

- Printer body ..... 1 unit
- Sample paper/label roll .....1 roll
- AC adapter..... 1 piece
- User's manual .....1 copy
- CD-R .....1 piece

⚠ CAUTION

- Install the printer body on a flat and stable desk or mount it onto the wall, etc., using a hook, etc.
- Do not install the printer near a heater or in a place exposed to the direct sunshine.
- Do not use the printer in a high-temperature, high-humidity, or contaminated environment.

- Do not allow dew condensation to form on the printer. If such condensation should form, do not turn on the power until it has completely gone away.
- Use only the accessory AC adapter. Do not use it for any other purpose.
- If you do not use the printer for a long period, disconnect the power cable from the socket.
- Keep this manual carefully at hand for ready reference.

2. BASIC RULES FOR OPERATING THE LP-50

FOLLOW INSTRUCTIONS CLOSELY
MAY CAUSE DAMAGE TO THE UNIT

- The LP – 50H is operated ONLY with its own DC adapter.
- Attempts to print on other types of paper, stickers, folio not specified as acceptable in this MANUAL may seriously damage your printer.
- When inserting the paper roll be careful not to let any pins, paper clips or other hard objects fall inside the printing mechanism.
- Do not spill liquids of any kind on the device.
- Print only on specified thermal paper-rolls.
- Don't force paper out from the printing mechanism.
- Should the printer behave unusually during operation immediately turn it off!
- Printer repairs are performed only by service technicians. Do not attempt to repair the unit yourself.

⚠ CAUTION

The printer operates with paper rolls with sizes:
- roll with labels: width 58 mm;
- maximum diameter of roll: 83 mm

3. OUTER VIEW--- CONTROL

3.1 General description of the LP-50H

The LP-50H is a thermal printer designed to print small sized labels and graphics on thermo-sensitive paper. It is particularly useful when printing information, arranged in a template form, which has to be partially modified under customer demand.

The memory of the printer contains a command file which stores data for the arrangement and design of the separate graphic elements, easing your work considerably when you have to print a greater number of labels. On the other hand it supports the PCX format and gives you the opportunity to design the graphics of parts of the label with an appropriate program under Windows and store it in the memory of the printer in advance. The built-in 6 matrix fonts with different sizes, as well as the freely selectable option for additional scaling and rotation, gives you greater freedom in designing the inscriptions on your labels. If those fonts do not satisfy your requirements you are free to load additional fonts in the memory of the device.

The device may be used to print information from Windows (Word, Notepad or other programs) after the installation of the necessary driver.

In conclusion, the LP-50H offers fast and flexible printing at a quality which is very similar to that of most contemporary laser printers (printing density - 203 dpi).

3.2 Operating the printer

The functions of the printer are controlled by commands, sent via a serial interface. It is able to maintain 7 baud rates set up by adjusting the configuration keys: 2400, 4800, 9600, 19200, 38400, 57600 and 115200 bps, 8 bits, no parity bit. The printer uses a hardware protocol, which permits its direct control under DOS but can also support Xon/Xoff protocol.

Each printer command consists of one line of text ending with a LF (0Ah). Commands are made up of one or two letters followed by a different number of parameters divided by a comma. Intervals MUST

NOT BE ENTERED in these commands – this will be treated as syntax error.

Capital and small letters are identified. A detailed description of the commands follows but it must be underlined that if a command starts with ";" it will not generate any action on the part of the printer. This command may be used for comments if we register the commands in a text file.

The fastest and easiest way to work with this printer is to use the accompanying program **Label Editor (LPeditWH.EXE)** with the help of which you can arrange the elements of the label and see its final appearance on the computer screen even before loading it into the printer. You can also print it out as a test trial. In order to work with the program successfully you will only need to have a general idea about the functions of the printer.

✓ No special knowledge of the command language will be needed.

It is, of course, possible to prepare the information for printing in advance in a text file and send this over the serial interface. Here is a description of one possible option for preparing a label. It includes the following stages:

✓ When working under DOS, the setup of the PC serial port is done with the MODE COMn command in parallel to the setup of the printer, the format of this command being:

MODE COMn: BaudRate,n,8,1 where "n" is the number of the serial port and "BaudRate" is the set up speed of the printer.

✓ Select a name for the form. In any case it is advisable that the first line of the text file should include the command for deleting a form of the same name (FK) - if such exists, it will be deleted and replaced with the new one. You may then proceed with the loading of a new form (command FS).

✓ The length of the label is defined as well as the distance between the separate labels. When using paper rolls these distances may be arbitrarily selected and set but when working with self-adhesive labels, the length of the label must be set as close to its actual dimensions as possible or the result may be incomplete printouts or empty labels. The command Q, with all demanded parameters, is placed at the beginning of the text file. Other commands may also be located here -

✓ starting point (R), select code table (I), print density (D) and printing speed (S).

✓ Designing the appearance of the label. Setting the elements, which will not be subject to changes - they will need no counters or variables.

✓ Setting and defining the elements subject to changes for each label. When some of them are whole numbers and will change at regular rates a counter may be defined for them. The rest must be variables. Depending on the case in question the information on a given inscription or bar code may be set in several different variables and/or counters.

✓ Defining variables and counters includes an assessment of their maximum possible length, alignment if and when the text is shorter than the maximum length, rate of growth of the counters. The selection of the initiating text is important too if it is not informative operating with the forms later on may be difficult. A line with the command "V" or "C" is added in the text file for each counter or variable.

✓ If we wish to insert graphics in the label, we must select a name and position for this element and add a command for its layout in the text file (GG). The PCX file must be prepared in advance on a PC and loaded into the printer prior to the execution of the form. Before sending it to the printer its length must be verified and noted because the loading command GM will demand this information. One possible way for doing this is by sending the file from a terminal program with the DOS command COPY FileName COMn: /B (sending the file as binary in this case is obligatory) - "n" is the number of the serial port.

✓ Selecting the position, font, size and orientation of the inscriptions on the label. "A" commands are added for this purpose and if necessary, the inclusion of text modifiers for the counters and the variables for receiving the necessary strings for printing.

✓ Selection of the type, position, size and orientation of the bar codes - if there will be such - where modifiers may also have to be used.

✓ If drawing of lines and frames is needed the following commands may be added - LE, LO, LW, X.

✓ At the end of the file the command FE is added - "Form End".

✓ The ready file is then sent to the printer: the form should be loaded into the memory and be printed out in the list with the FI command.

With the FR command the form may become active. Values of the variables and counters are added with the command "?" from a terminal program.

The forms, the graphics and loadable fonts use a common memory of the printer, i.e., if we enter more graphic information there will be less memory left for forms and vice-versa. This memory restriction comes for two reasons: on one hand not more than 512 forms, graphic files and fonts can be stored in the memory, irrespective of how small they happen to be. On the other hand is the restriction related to the volume of the memory itself, which is 506 kB. It must be remembered that the memory intended for storing forms and graphics is distributed in parts of 256 bytes each meaning, that even a form of only 10 bytes will take up 256 bytes of the volume of the memory.

The maximum length of the printed label is defined by the size of the graphic buffer - 4000 dots (500 mm). The maximum width is 384 dots (48 mm) given complete width of the paper roll - 58 mm.

When the printer is used for longer printing sessions the printing head unit may heat considerably and printing is interrupted for cooling off. It is for this reason that when printing labels with larger black areas the printer must be switched off at shorter interval for cool off.

3.3 DIP switches and buttons

3.3.1. Configuration switches

Sw1	Sw2	Sw3	Baud rate (bps)
OFF	OFF	OFF	Local keyboard
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600
OFF	OFF	ON	19200
ON	OFF	ON	38400
OFF	ON	ON	57600
ON	ON	ON	115200

	OFF	ON
Sw4	Hardware protocol	XON / XOFF protocol
Sw6	Paper roll printing	Sticker label
Sw8	Normal operation mode	LP-50 compatible

3.3.2. Operation buttons

The FEED button extracts paper until it is released. In the "sticker type labels" mode positions the printing head over the next label.

⚠ CAUTION

If you keep the button pressed when printer is switched off and switch it on in the meantime it will print out diagnostic information and then will enter the dump mode. After this operation the printer MUST be switched off and on again to return to normal mode!

3.4 Indicators

POWER Lights in green when printer is ON.

ERROR Normally when printer is ON it is not active.
Blinks in red when printer is overheated.

PAPER Off during normal printer status.
Lights in red when paper is over and blinks in red if no label is found.

3.5 List of commands

3.5.1. By categories

- **Setting the functional mode of the printer**

Setting the printing density		D
Selecting the Code table		I
Set / Cancel condensed text mode		j
Setting the page length		Q
Setting the page width		q
Setting the starting point		R
Setting the printing speed		S
Setting date/hour	*	TS
Setting date format		TD
Setting hour format		TT
Setting print direction		Z

- **Working with counters and variables**

Setting values for counters / variables	*	?
Defining counters		C
Defining a text variable		V

- **Generating a graphic image**

Generating a line of text		A
Drawing a bar-code		B
Drawing rectangles in XOR mode		LE
Drawing rectangles in black		LO
Drawing rectangles in white		LW
Drawing diagonal lines		LS
Drawing a frame		X
Drawing out a loaded PCX file		GG
Drawing a 2D bar-code (PDF417)		b

- **Working with forms (command files)**

Start of a new form	*	FS
End of a new form	*	FE
Loading a form	*	FR
Deleting a form	*	FK
Recovering the name of the active form	*	FA
Listing of the leaded forms	*	FI

- **Working with graphic files (monochrome PCX format)**

Saving a new PCX file	*	GM
Deleting a PCX file	*	GK
Direct printing of graphics	*	GW
Listing of loaded PCX files	*	GI

- **Working with loadable fonts**

Saving a new font	*	ES
Deleting a font	*	EK
Listing of the loaded forms	*	EI

- **Clearing the memory**

Clearing the operational memory	*	M
Clearing current forms and graphic buffer	*	N
Entering default settings	*	RESET

- **Print**

Printing a label	*	P
Resuming an interrupted printing session	*	PC

- **Information and diagnostics**

Printing diagnostic information	*	U
Retrieving diagnostic information	*	U@
Info on occupied memory	*	UM
Returning a list of loaded forms	*	UF
Returning a list of loaded graphics	*	UG
Returning a list of loaded fonts	*	UE

3.5.2. In alphabetical order

Setting values for counters/variables	*	?
Direct printing of text	*	=
Select/cancel "print text"	*	@
Generating a line of text		A
Drawing a bar-code		B
Drawing a 2D bar-code (PDF417)		b
Defining counters		C
Listing of the loaded forms	*	EI
Deleting a font	*	EK
Saving a new font	*	ES
Recovering the name of the active form	*	FA
End of a new form	*	FE
Listing of the leaded forms	*	FI
Deleting a form	*	FK
Loading a form	*	FR
Start of a new form	*	FS
Drawing out a loaded PCX file		GG
Listing of loaded PCX files	*	GI
Deleting a PCX file	*	GK
Saving a new PCX file	*	GM
Direct printing of graphic info	*	GW
Selecting the character table		I

Set / Cancel condensed text mode		j
Drawing a rectangle or a line		L
Clearing the operational memory	*	M
Clearing current forms and graphic buffer	*	N
Printing a label	*	P
Resuming an interrupted printing session	*	PC
Setting the page length		Q
Setting the starting point		R
Entering default settings	*	RESET
Setting date/hour	*	TS
Setting date format		TD
Setting hour format		TT
Printing diagnostic information	*	U
Retrieving diagnostic information	*	U@
Returning a list of loaded fonts	*	UE
Returning a list of loaded forms	*	UF
Returning a list of loaded graphics	*	UG
Info on occupied memory	*	UM
Defining a text variable		V
Drawing frames		X
Setting the direction of the print		Z

NOTE:
The commands marked with "*" cannot be included into a form (command file)

4. DETAILED DESCRIPTION OF THE COMMANDS

4.1 Setting the printer's functional mode

Select / Cancel direct text printing mode

The command sets the printer to a mode, in which all lines received are printed and not executed as a command. In the "sticker labels" mode the margin between the labels is skipped.

Format: **@n**

Where n may be 0, 2, 3 or 4; 0 cancels this mode while the other values set the direct text printing mode using the corresponding font number.

Setting the printing density

Offer the option to adjust the printing density depending on the sensitivity of the paper and the character of the printed information.

Format: **Dn**

n may have values from 0 to 15 where 15 sets the maximum density possible. Setting higher density rates leads to slower printing.

Example: **D6**

Set the printing density to 6.

Select / Cancel condensed print mode

When condensed printing is selected, the white frame around every text symbol is not printed. So the width of every symbol becomes two dots smaller and more symbols per line can be printed. The selected mode is memorized after switching the printer off.

Format: **jn**

n=0 Normal print (default)

n=1 Condensed print

Setting the printing speed

Format: **Sn**

Where n may be between 0 and 2 , the value being approximately 25.0, 37.5 and 50 mm/sec. At higher density rates the printer may not be able to print at this speed.

Example: **S2**

Printing speed is set at 50 mm/sec.

Selecting the code table

The printer supports 13 code tables. There are no images for the symbols with ASCII codes 0 - 31.

Format: **In**

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)
n=12: Arabic

Example: **I1**

Select the Bulgarian set of symbols.

Setting the length of the page

Format: **Qm,n[+p]**

m is the length of the printed area. Possible values are between 80 (10) and 4000 (500 mm).

n is the added space after the printout. Possible value - not more than 255 (32 mm).

p is an optional parameter, determining the additional offset of the printable area when using labels with black line.
When paper rolls are used 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 dots/inch. If
there are elements outside of this size when the image is generated they will be cut off.

Example: **Q240,80**
Set the length of the page - 30 mm - and dividing space 10 mm. When sticker-labels are used sets the borders of the label, and prints exactly one image per label. In spite of this the parameters must be within the set limits as quoted above.

Setting the starting point of the print

Set the starting point of the printing area.

Format: **Rm,n**

m is the horizontal offset. Possible value is 0 - 383.

n is the vertical offset. Possible value is between 0 and 3999.

Example: **R24,24**
Sets an initial offset on X and Y of 3 mm.

Setting the print direction

Set the position of the image during print.

Format: **ZT or ZB**

ZT Normal image

ZB Image rotated to 180°

Set date and hour

The command is used to set the real-time clock of the printer.

Format: **TSm,d,y,h,m,s**

m month (1 - 12)

d day (1 - 31, validity of the date being checked)

y year - the last two digits (0 - 99).
h hour (0 - 23)
m minutes (0 - 59)
s seconds (0 - 59)

Example: **TS04,2,04,14,10,10**
Sets clock to 2 April 2004, 14:10:10

Setting date format The command sets the mode in which the string will generate the current date.

Format: **TDAxByC**
With capital letter the fields for the date have been marked. A, B and C may have the following values, which may be used not more than once:

Y2 or **Y4**
The current year, marked with 2 or 4 digits.

ME or **MN**
The current month shown in three letters or two digits.

DD The current day of the month.

The small letters 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.

Example: **TDdd-me-y4**
This would generate a date of the type: **02-APR-2004**

Setting hour format
The command sets the mode in which the current hour will be generated by the string.

Format: **TTAxByC**
Schematically the fields of the hour have been marked with capital letters. A, B and C can have the following values which may be employed not more than once.

H: The current hour.
M: The current minute.
S: The current second.

The small letters are used to designate the spaces between the fields. They are entered immediately after the symbol, which we wish to use.

Example: **TTh:m:s**

This will generate a string of the type: **15:30:20.**

4.2 Working with variables and counters

Defining a counter

Offer the option to define up to 8 counters, which are whole digit variables, the values of which change 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 a bar code.

Format: **Ca,b,c[d],e,f**

- **a** Logical number of the counter (0 - 7)
- **b** Maximum Length (1 - 24)
- **c** Alignment. Possible values:
- **N** No alignment. The true length is used.
- **R** The counter string is right aligned while on the left the maximum length is set joined by the fill-in symbol.
- **L** The counter's string is left aligned while on the right the maximum length is set joined by the force justify symbol.
- **C** The string of the counter is centered while on the left and right ends to the set length the fill-in symbols are joined.
- **d** The additional symbol to the previous argument. If not entered a space will be included.
- **e** Growth rate. This is whole digit with a sign; the counter will automatically change after printing. Possible values: -100 to +100.
- **f** Text prompt. This is string closed by inverted commas not longer than 25 symbols. At the initialization of the counter the printer will send this text via the serial port.

Example: **C0,6,R0,+1,"Counter1:"**

Defines counter number 0 with a maximum length of 6 bytes, right aligned with zeros and a rate of +1.

Defining a text variable

Offer the option to define up to 32 variables. Initialization starts with "?". Used singularly or in combination with other variables and counters for generating texts or bar-codes.

Format: **Va,b,c,d,e**

a The number of the variable (0 - 31)

b Maximum length (1 - 63)

c Alignment - possible values:

N No alignment - actual length is used.

R The string of the variable is right aligned - on the left the set length is filled with the additional symbol.

L The string of the variable is left aligned - on the right the set length is filled with the additional symbol.

C The string of the variable is center aligned while on both sides the maximum length is filled in with the additional symbols.

d This is the additional symbol for the preceding argument. If it is not selected space is used.

e A suggestive text (prompt). This is a string closed by brackets and a max. length of 25 symbols. At initialization of the variable the printer sends this text over the serial port.

Example: **V1,6,L,"Name:"**

Define a variable No.1 with a maximum length of 6 bytes, left aligned with spaces.

Initialization of variables and counters

After this command the printer asks for initialization values for the defined counters and variables in the order of their logical numbers. After each entry the printer sends a text prompt via its serial port. If a longer string is sent it will cut off from the right end. Empty strings will call out the old value of the counter or

variable. Initializing a counter with a string, which cannot be interpreted as a positive number will be rejected.

Format: **?**

Clearing the content of variables and counters

The command clears the contents and deactivates all variables and counters.

Format: **VC**

4.3 Generating a graphic image

Generating a text

The command is used for inserting textual information in the image.

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

a Starting coordinate on X for the upper left angle of the text: 0 - 2047.

b Starting coordinate on Y for the upper left angle of the text: 0 - 4095.

c Text orientation: 0=0o, 1=90o, 2=180o, 3=270o where rotation is clockwise.

d Font selection, where the following values are possible:

- **0:** 12x24 dots
- **1:** 8x12 dots
- **2:** 10x16 dots
- **3:** 12x20 dots
- **4:** 14x24 dots
- **5:** 32x48 dots
- **6:** 24 x 24 dots Hangeul or Chinese font (For Korean or Chinese version only)

d can be a Latin letter in which case it is a name of a loadable font. The size of the symbols is there contained. Around each of the in-built 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 Selection of a multiplier for X of the font. Possible values are 1 - 8.

f Selection of a multiplier for Y of the font. Possible values are 1 - 9.

g Printing mode: **N** - normal, **R** - inverted, **B** - bold, **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 is described further on.
If code table **11** (Hebrew) or **12** (Arabic) is selected, the text is printed from right to the left. You can change the print direction placing the symbol '*' before the text data. If the symbol '*' is placed after the font name, then code table 0 (CP437) is used for this text line independent of the last command 'I' executed.

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 12 x 20 multiplied times 2 in a horizontal and vertical direction. The text is not inverted.

Generating bar-codes

The command is used for inserting a bar code in the image.

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

a Starting coordinate on X for the upper left angle of the text: 0 - 2047.

b Starting coordinate on Y for the upper left angle of the text: 0 – 4095.

c Text orientation: 0=0, 1=90o, 2=180o, 3=270o where rotation is clockwise.

d Selection of the type of bar code for printing - text from 1 to 3 symbols. The possible values are in Table 1.

e Setting the thickness of the narrow bar in dots. Possible values: 1 - 6.

f Setting the thickness of the wide bar in dots. Possible values 2 - 10, where the value must be bigger than the previous parameter. Some of the bar code demand additional restrictions.

g Height of the bar code in dots. Possible values are between 24 and 1000.

h Duplicate information in textual form or not. Possible values:

N no

B yes

i A non-compulsory parameter, showing the alignment of the duplicating text in relation to the bar code. Accepted only if the preceding parameter has a B value. Possible 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,"123456789012"**

Will create a bar code image of the EAN13 type with a starting coordinate (0,0), not rotated, with bars 2 dots wide, 60 dots high with a duplicating text with content: "123456789012".

Table 1:

String	Bar code type
3	Code 39
3C	Code 39 with check digit
9	Code 93
0	Code 128 UCC
1	Code 128 auto A,B,C modes
K	Codabar
E80	EAN8
E82	EAN8 2 digit add-on
E85	EAN8 5 digit add-on
E30	EAN13
A30	EAN13 with internal control digit
E32	EAN13 2 digit add-on
E35	EAN13 5 digit add-on
2G	German Post Code
2	Interleaved 2 of 5 (ITF)
2C	Interleaved 2 of 5 with mod. 10 check digit
2D	Interleaved 2 of 5 with human readable check digit
P	Postnet
1E	UCC / EAN 128
UA0	UPC A
UA2	UPC A 2 digit add-on
UA5	UPC A 5 digit add-on
UE0	UPC E
UE2	UPC E 2 digit add-on
UE5	UPC E 5 digit add-on
2U	UPC interleaved 2 of 5
L	Plessey (MSI-1)

Drawing a rectangle

There are three commands designed for this operation. LO prints in black, LE inverts the dots located below the line (in the XOR mode), while LW prints, unconditionally, in white.

Format: ***LOa,b,c,d or***
LEa,b,c,d or
LWa,b,c,d

a Starting coordinate for X: 0 - 2047
b Starting coordinate for Y: 0 - 4095
c Size for X: 1 - 2047
d Size for YL: 1 - 2047

Example: **LO10, 10, 100, 200**

Draws a rectangle with coordinates (10,10), (110,10), (110,210) and (10, 210) in black.

Drawing a diagonal line

Format: **LS[m]a,b,c,d,e**

m Non-compulsory parameter. Possible values:
E mode XOR
W white
a Starting coordinate for X: 0 - 2047
b Starting coordinate for Y: 0 - 4095
c Line thickness: 1 - 80
d End coordinate for X: 0 - 2047
e End coordinate for Y: 0 - 4095

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.

Drawing frame

The command generates a rectangular frame with a set line thickness.

Format: **Xa,b,c,d,e**

a The X coordinate of the right angle: 0 - 2047
b The Y coordinate of the right angle: 0 - 4095
c Frame thickness: 1 - 80. Thickness is at the expense of the inner area.

d X coordinate of the opposite angle: 0 - 2047

e Y coordinate of the opposite angle: 0 - 4095

Example: **X10, 10, 3, 360, 250**

Draw a rectangle with a size of 250 x 240 and frame thickness of 3 dots.

Generating 2D bar-codes

The command is used for inserting 2D bar-code in the image. Only PDF417 is supported.

Format: **bp1,p2,p3,p4,p5[,pi...],"Data"**

p_1 Starting coordinate on X for the upper left corner of the bar-code: 0 to 2047.

p_2 Starting coordinate on Y for the upper left corner of the bar-code: 0 to 4095.

p_3 Bar-code type. Must be 'P' for PDF417. MacroPDF and Extended Channel Interpretation are not supported.

p_4 Maximum print width in dots. 0 to 384.

p_5 Maximum print height in dots. 0 to 1024.

The following parameters are optional. When not entered, default values are used. Each parameter is identified by a single letter:

p6 (s) Error correction level. Allowed values: s0 – s8. If not specified, the value is calculated using the following table:

User data code words	EC Level	EC code words
-	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

p_7 (c) Data compression method.
- **c0** Auto-encoding (default).
- **c1** Binary mode.

p_8 (p) Print human readable data. Non-standard PDF417 and should be used for troubleshooting purposes only. Internal format: **px,y,n**

x X start coordinate. 0 – 2047.
- **y** Y start coordinate. 0 – 4095.
- **n** Maximum characters per line. 1 – 40.

p_9 (f) Bar-code origin point.
- **f0** Bar-code origin point is defined by parameters **p1** and **p2**.
- **f1** Bar-code is centered in the rectangle, defined by **p1**, **p2**, **p4** and **p5**. This is the default.

p_{10} (x) Set maximum module width (in dots). Allowed values: x2 to x9. Default: x6.

p_{11} (y) Set maximum bar height (in dots). Allowed values: y4 to y99. Default is 4 times module width (4*p10).

p_{12} (r) Set maximum row count. Allowed values: r3 to r90. Default: r90.

p_{13} (l) Set maximum column count. Allowed values: l5 to l34. Default: l34.

p_{14} (o) Rotation. Allowed values: **o0**: 0, **o1**: 90, **o2**: 180, **o3**: 270 degrees. Default **o0**.

Data Contains bar-code data. The format is the same as the data format for text and bar code, but it is possible additionally to encode non printable characters (with ASCII codes below 32) using the syntax '**\dd**', where dd is the decimal representation of the ASCII code.

If the bar-code with the selected module width and height fits not in the area, defined by p1, p2, p4 and p5, the printer automatically starts to lower p10 and p11 until the area of the bar-code becomes small enough to be

printed. Row and column count are calculated so the proportions of the bar-code are as near as possible to p4: p5. If this procedure fails, the bar-code is not printed.

Example: **b0,0,P,320,100,f0,"DATECS Ltd.\10www.datecs.bg\10"**
will print the a PDF417 bar-code containing the data:
Upper left corner of the image will be (0, 0). Starting from module width 6, the printer reduces the size until the bar-code can be printed. The resulting bar-code has 9 columns and 5 rows. Error correction level is automatically set to 1 (4 error correction code words). Auto compression mode is selected, the printer uses text compaction with shift to byte compaction for encoding the <LF> characters.

Direct printing of graphics

The command permits the screening of a graphic image in the memory of the printer, which has not been saved there in advance.

Format: **GWa,b,c,d,e**

- **a** X coordinate of the upper left angle: 0 - 2047.
- **b** Y coordinate of the upper left angle: 0 - 4095.
- **c** Horizontal size in units of 8 dots (bytes) 1 - 127.
- **d** Vertical size in dots: 0 - 2047.
- **e** Graphic lines. There are c*d bytes of information, 8 dots per byte where bit 1 is a black dot. Data is sent in horizontal lines from left to right. CR and LF are added at the end of all data.

Format of the text information for commands A (text) and B (bar code)

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 date 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. Their encoding is as follows:

Free text: This is entered directly and is closed by inverted brackets. If the symbol " has to find a place in the text it must be preceded by '\'.

Current date: It is coded with TD[m], where m is not a compulsory whole number from -3500 to 3500 setting the offset size in relation to the current date.

Current hour: Coded with TT

Variable: Format: Vn[-ml+m] [Modifiers]

n Number of the variable.

m Not obligatory parameter – an integer between 0 and 10000. If present and the variable can be interpreted as an integer number, then this value is addred 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 variable 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 the end symbols which are identical to the symbol following the mark of the modifier.

Rn Cuts off the symbols to the left of n.

Ln Leaves the last n symbols in the string.

Mm.n Separates n symbols from the string starting from the position m.

If the string can be interpreted as a whole number cuts off the leading zeros.

Xmn Substitutes all symbols with value m with the n symbol.

G After this symbol other modifiers must follow. They will act as global modifiers – the whole text until

the current position will be changed, not the last variable or counter.

Counter: **Format: Cn[-ml+m] [Modifiers]**

n Number 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 something like this: Date: 02.APR.2004 Time: 16.30

V0> < C1L3V0> < C1L3

will create a string from the variable V0, which is cleared off leading and end 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 symbol of the variable V0.

4.4 Working with forms

Starting to save a new form

This command starts the entry of a new form in the operational memory of the printer. All valid commands, which are sent to the printer between this command and FE will be saved in this form. If any of the commands is rejected due to syntax error 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 with FK - in the opposite case the command will be rejected.

Format: **FS"Name"**

Name is the name of the file, which have at the most 8 symbols. All symbols with ASCII codes between 32 and 127 including are acceptable excluding the symbol '*'. Small and capital letters are not distinguished so that "Test" and "TEST" are one and the same form.

Example: **FS"Test"**

End of form

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 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**

Loading of a form

The command announces the information entered earlier as active. From this point on the information in question will be executed automatically at each command for printing. 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"**

Name: The name of the form. A form with this name must be loaded into the memory.

Example: **FR"Test"**

eting a form

The command deletes existing form or all forms. The engaged memory after this is freed.

Format: **FK"Name"**

Name: The name of the form - a form of that name must be saved in the memory. If '*' is entered as a name all forms will be deleted.

Information on the loaded forms

The command initiates the printing of all loaded forms or returns via the serial port the content of one of them.

Format: **FI**

Prints a list of all forms.

Format: **FP"Name"**

Prints the contents of the form "Name".

4.5 Working with graphic files

Loading a new graphic

Save 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 a graphic file of that name or the entered size of the file is greater than the size of the free operational memory. The file must be in the PCX format, monochrome - in any other case it will not be loaded. It can be produced in different programs under Windows - for example PhotoShop.

Format: **GM"Name",n**

Name: The name under which the graphic file will be saved in the memory of the printer.

n The length of the file (not more than 32768 bytes). After the command the set quantity of bytes must be sent to the printer.

Example: **GM"Logo1",3530**

The saving of a graphic file under the name "LOGO1" will begin (with a length of 3530 bytes).

Drawing out of a graphic file

The command starts the printing of a graphic file, stored in the buffer of the printer under that name.

Format: **GGa, b, "Name"**

a X coordinate of the upper left corner of the graphic image (0 - 2047)

b Y coordinate of the upper left corner of the graphic image (0 - 4095)

Name: Name of the graphic file

Example: **GG20,150,"Logo1"**

Deleting graphic files

The command deletes an existing graphic file or all graphic files. After deletion the memory is freed.

Format: **GK"Name"**

Name: The name of the file (a file of that name must be found in the memory).

Information on loaded graphic files

Print out a list of all loaded graphic files.

Format: **GI**

4.6 Working with loadable fonts

Loading a font

The command is used for loading additional fonts in the printer. The loadable fonts may contain from 1 to 256 symbols not necessarily arranged in a fixed order. You can create your own fonts using the syntax of the command described further on or you may use ready programs for the purpose - for example Soft Font Downloader Utility.

Format:**ES"Name"p1p2p3a1b1c1D1a2b2c2D2 ... anbncnDn**

Name: The name of the font - one Latin letter.

p_1 One byte - the number of symbols in the font. Possible value is 0 - 225, which corresponds to 1 –256 symbols.

p_2 One byte - rotation of the font. Only a values of 00h is possible (not rotated).

p_3 One byte - the height of the font in dots. From 1 to 255.

a_j One byte - ASCII code of the j-th loaded symbol. From 0 to 255.

b_j One byte - distance to the next symbol in dots. From 0 to 255.

c_j One byte - width of the j-th loaded symbol in units of 8 dots each. From 0 to 255.

D_j Data on the j-th symbol. (p3*cj) bytes arranged in the order line by line from left to

right where each byte corresponds to a dot, "1" are black dots.

Deleting fonts

The command deletes an existing loadable font or all fonts. The engaged memory is freed.

Format: **EK"Name"**

Name of the font. String, which consists of only one letter, which must be found in the memory of the printer. If as '*' is entered all loadable fonts will be deleted.

Information on the loaded fonts

A list of the loaded fonts is printed out.

Format: **EI**

4.7 Clearing the memory

Clearing the operational memory

The command leads to the deletion of the whole information loaded into the printer, including forms, graphics, and fonts. All adjustments to the printer, accessible via commands acquire their default values.

Format: **M**

De-activation of the current form and deletion of the graphic buffer

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 the use of forms.

Format: **N**

Setting the printer to its default settings

The command sets the printer to given parameters:

50mm/c printing speed, print density 8, label length 200 dots, initial offset by X and Y 0, hour format - M:H:S, date format - DD-MN-Y2 and language - English.

Format: **RESET**

4.8 Print

Printing a label

The command initiates the printing out of the contents of the printer's graphic buffer. After the completion of this action it is automatically cleared and ready for generating a new label. After the end of the printing session the last label is pushed out of the printer in away so that it is completely visible and ready for use.

Format: **P[m,]n**

m The number of identical labels which will be printed out. The entering of a value greater than 1 is 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: 1 - 1000.

n The number of absolutely identical labels for print. The sum quantity for this command will be m*n. Possible value: 1 - 1000.

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

Example: **P2,3**

This command will print 6 labels of which the second 3 will have new counter values.

Resuming interrupted printing

If the last printing command has been completed successfully the command will activate no action on the part of the printer.

If, however, the last printing session has been interrupted you may activate its continuation from the point of interruption in order to get the required number of labels.

Format: **PC**

4.9 Diagnostics and returning of data

Printing out of diagnostic data

This command activates the printing of data on the status of the printing head as well as the model of the printer, available free memory the baud rate of the serial port and the values of the cur rent printer settings.

Format: **U**

Returning data on the engaged and free printer memory

The serial port transfers data in one line on: **a**, **b**, **c**, **d** where:

- **a** Is the memory, engaged with forms, presented in bytes
- **b** Is the memory, engaged with graphics, presented in bytes
- **c** Is the memory engaged with fonts, presented in bytes
- **d** Is the free memory in bytes.

Format: **UM**

Returning data on loaded forms

Format: **UF or FI"NAME"**

The first form of the command returns a list of the loaded forms in the memory of the printer, which has the following structure:

nnn The number of the loaded forms. 3 digits.

$Form_1$ mmm The name and the size of first form.

...

$Form_n$ mmm The name and the size of n-th form.

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 form under the entered name. The form must have been loaded there in advance. Data is sent line-by-line, lines being divided by the combination <CR><LF>. After the last line one byte is sent with the ASCII code 00h.

Returning data on loaded graphics

Format: **UG or GI"NAME"**

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

nnn The overall number of loaded graphics. 3 digits.

Gr_1 mmm The name and the size of the first graphic image.

...

Gr_n mmm The name and the size of the n-th graphic image.

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

The second form of the command makes the printer return the contents of the graphic image under the given name. The image must have been loaded in the memory in advance.

The data is sent in the following format:

$n_1 n_2 D_i$ where:

n_1 Most significant byte of total data count.

n_2 Least significant byte of total data count.

D_i Image data. The total bytes count is **n_1*256+n_2**. The format of the data is monochrome PCX.

Returning data on loaded fonts

Format: **UE or EI"Name"**

The first form of the command returns a list of the fonts, loaded in the printer having the following structure:

nnn Overall number of the loaded fonts. 3 digits.

$Font_1$ mmm Name and size of the first font.

...

$Font_n$ mmm Name and size of the n-th font.

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

n_1n_2D where:

n_1 Most significant byte of the total number of bytes in font.

n_2 Least significant byte of the total number of bytes - i.e, (**n_1* 256 +n_2**)

D Font data. The total bytes count is **n_1*256+n_2**.
The format of the data is described in the command for loading fonts (**FS**).

4.10 Direct printing of a text

Format: **=Line**

Print out a text directly, without savings in the graphic buffer. The printing results are always of a size 12 x 20 (No.3). When printing sticker labels the margin between the labels is skipped.

5. WORKING WITH THE LOCAL KEYBOARD EKP - 30

The 1200 bps baud rate is reserved for operating with the local keyboard. The local keyboard may be used to select forms, saved in advance, for printing; to print out a set number of labels; to change the value of the variables V0, V1 and V2 as well as the counters C0 and C1 plus the option to print a list of the loaded forms, graphic images and fonts.

The principle for operating the keyboard is as follows: the required information is entered with the keys - the end is placed via one of the reserved keys, indicated here below. Depending on this last entry, the printer interprets the information as the name of a form, the value of a variable or the number of labels for printing. When entering the information a short audio signal is emitted - after the last key entry it is rather longer, when receiving a command it is monotonous and irregular when establishing an error.

<table>
<tr><td>V0</td><td>V1</td><td>V2</td><td>C0</td></tr>
<tr><td>Esc</td><td>Form</td><td>List</td><td>C1</td></tr>
<tr><td>7</td><td>8</td><td>9</td><td>-</td></tr>
<tr><td>4</td><td>5</td><td>6</td><td>+</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td rowspan="2">Print</td></tr>
<tr><td colspan="2">0</td><td>.</td></tr>
</table>

Description of the keys:

V0, V1, V2, C0, C1:

When pressing anyone of these keys the information entered is saved in the printer as a value of the respective variable or counter.

Esc:

The entered information is canceled.

Form:

A "D" is added at the beginning of the information entered previously and a new form is loaded with the respective name. Depending on the signal from the printer one can identify whether such a form exists or not.

Example: **"1" + "2" + "3" + "Form"**

will load the form "D123" - if it exists.

List:

Depending on the digit entered previously, a list of forms, images or fonts, loaded into the printer will be printed out:

"1" - List of forms
"2" - List of graphic images
"3" - List of fonts

If nothing has been entered a list of forms will be printed out while all other values are errors and cause no reaction from the printer.

Print:

Prints one or more labels from the active form. Possible options:

Prior to pressing <Print> nothing is entered - prints 1 label.

A string of the type **"m.n"** has been entered. **"m"** number of **"n"** labels are printed. Any of these parameters may be skipped and **1** is executed by default. If both are skipped (only **"."** has been entered, finishing a previous print will be executed.

Keys **"0"** to **"9"** **"-"**, **"+"** are used to enter these symbols.

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