



BASIC MANUAL



EBS-1500 SERIES PRINTER WITH ONE ELECTROMAGNETIC PRINT HEAD

VERSION: 20060214#1.0

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1. General Information

The complete information on the printer's accessories, installation, configuration and operation are contained in *The EBS-1500 Printer User's Manual*. This document contains only basic information on how to start and stop the **EBS-1500** series printer, input a text to be printed, print the text, exchange an ink bottle and rinse out nozzles if they are choked up.

2. Printing System Elements

Major components of the printer with a single electromagnetic head are shown in **Fig. 2.1**.

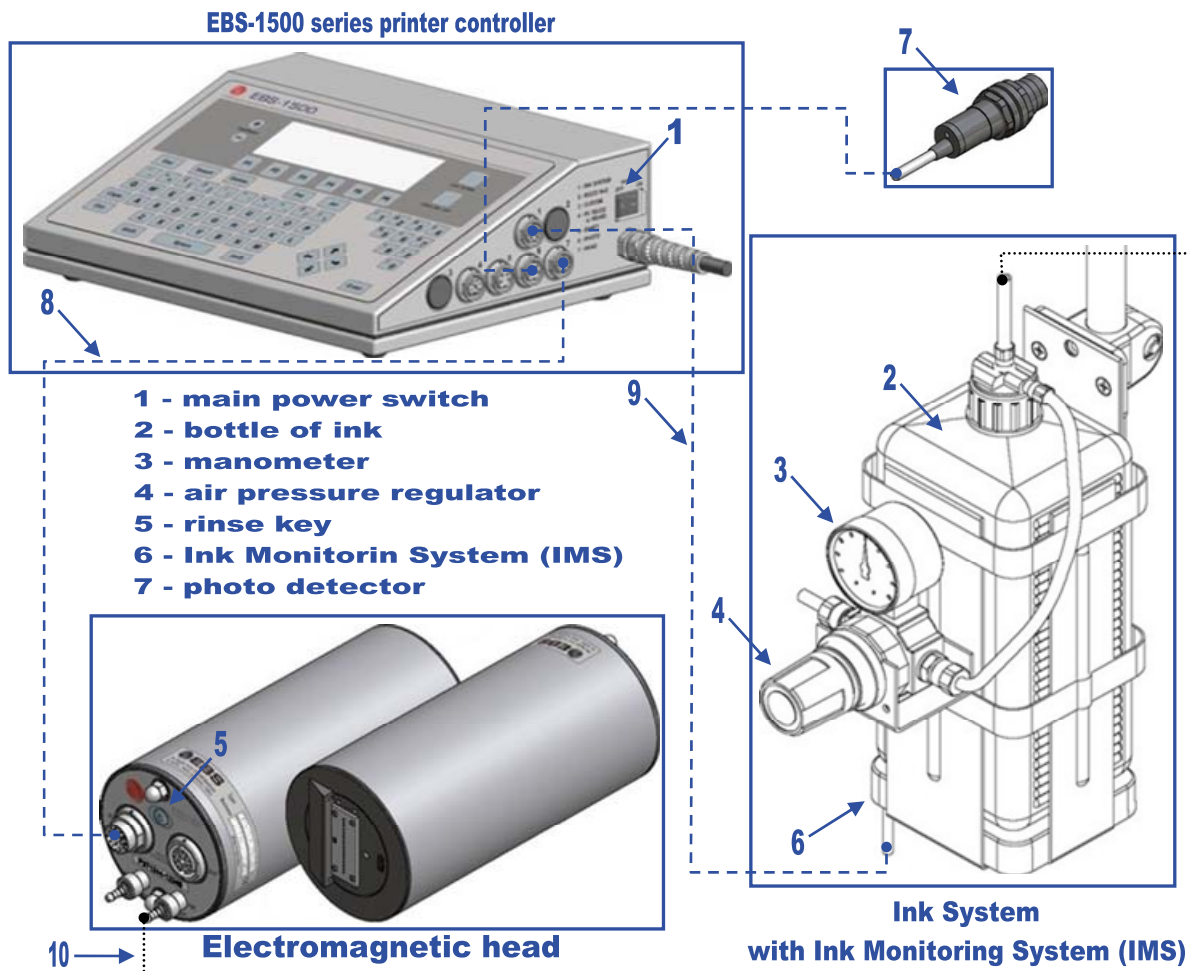


Fig. 2.1

In addition, the printing system may contain many other subassemblies such as a shaft-encoder, assembly jigs and tubes, cables (e.g. a cable to connect the printer controller with the head – see item 8 in **Fig. 2.1**, IMS signal cable – see item 9 in **Fig. 2.1**), ink tubes – e.g. item 10 in **Fig. 2.1**, an additional external signalling device and many others. For more details refer to section *Installation of the Printer* in *The EBS-1500 Printer User's Manual*.

3. Safety Requirements

NOTE:

- The printer should be operated by trained staff.
- Place a fire extinguisher in the vicinity of the printer (to put out electrical equipment or flammable solvents should they be on fire).
- Do not print in rooms which are at risk from explosion.
- Do not print on objects whose temperature exceeds 100°C at the time of printing.
- Do not use open fire or spark generating devices in the area where the printer works.
- Plug in the printer to the socket that is equipped with equipment earth.
- Do not point the head outlet to persons or animals during printing.
- Wear protective clothes while performing operations in the ink system.
- Do not use plastic vessels for washing. Metal vessels are recommended.

- **Do not leave ink, solvent or wash-up in open vessels.**
- Before approaching flammable liquids discharge static electricity by touching an earthed, metal object (e.g. the earthed printer housing).
- Only original agents are approved for use with the printer or otherwise all rights to claim under the guarantee will be lost !!!

In the case of accident...

- ➔ When ink or solvent spills occur, the spilled fluid should be wiped with a piece of absorbent material and then removed in compliance with fire and health and safety at work (HSE) regulations.
- ➔ If the clothing has been splashed, remove it as soon as possible.
- ➔ Should the eyes or skin get irritated:
 - EYES** need to be rinsed with running water for at least 15 minutes, then you should see your oculist,
 - SKIN** needs to be washed with water and soap.

4. Operating the Printer

Before starting the printing system ensure that the appropriate operating conditions are satisfied, paying especial attention to the following:

Power supply: **100-240V/45-440Hz (AC)** or **90-350V (DC)**,

Compressed air:

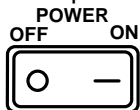
- upstream (inlet) pressure: **0.5 - 10 bar**,
- downstream (outlet) pressure: **0.3 - 0.6 bar** (rated pressure is **0.4 bar**).

The compressed air pressure is adjusted with a regulator (item 4 in **Fig. 2.1**). After preliminary settings of the print parameters have been made (see section **4.5 Setting Print Parameters**) adjust the pressure so that the optimum print quality is ensured (changes in pressure result in changes in the size of ink drops in your print). Ink consumption increases along with pressure increase. If the pressure setting is too high, the print may be distorted (e.g. the print intensity may be too high, ink splashes may occur around the print, neighbouring drops may overlap).

4.1. Switching the Printer On

The **ON/OFF** power switch is situated on the right side wall of the unit next to the feeder cable. It isolates both power leads from the mains (see item 1 in **Fig. 2.1**).

If the printer controller, head and ink system connectors are all connected, it is enough to switch the power switch

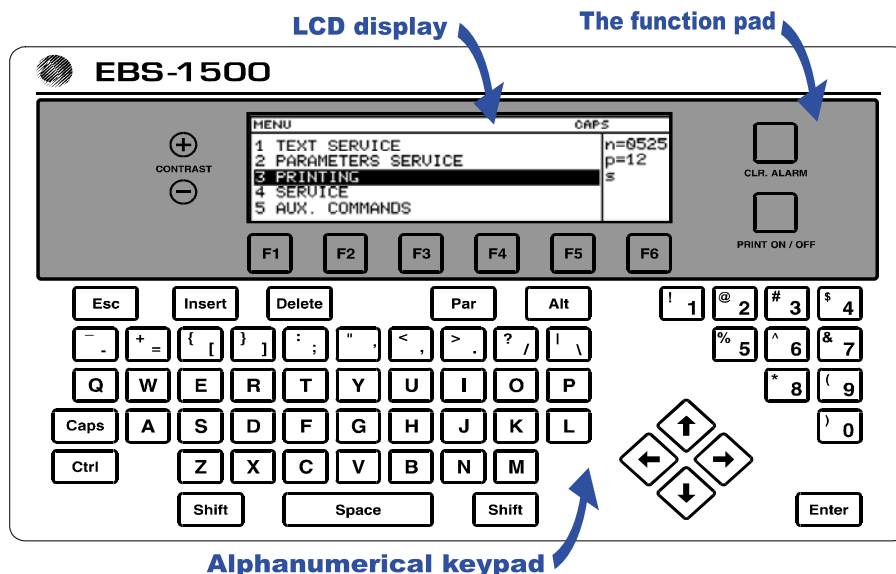


to the **ON** position. Then, the starting procedure is initiated.

If no errors are displayed on the printer controller screen or signalled with a sound alarm during the starting procedure, the printer is ready for printing. A detailed description of errors and alarms is contained in *The **EBS-1500** Printer User's Manual*.

4.2. Operation Panel

The operation panel enables the printer operator to control and monitor the unit's operation, and initiate actions as might be required in given circumstances. It is also used for performing such basic operations as turning the print mode on or off, locating faults, clearing alarms, etc. For more details refer to chapter Operating the Printer in *The EBS-1500 Printer User's Manual*.



4.2.1. LCD display

The display area is divided into separate sections called windows.

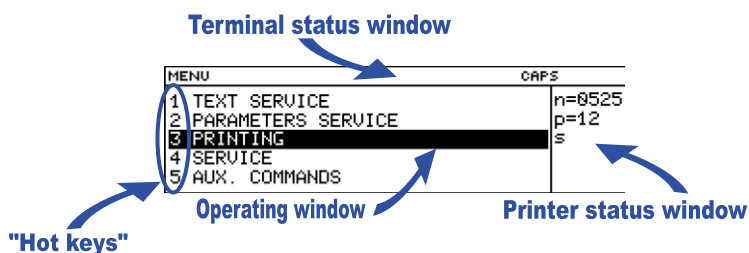


Fig. 4.2.1

The windows are designed for the following:

- The terminal status window – contains information on the current terminal settings, and indicate for example, the graphic cursor co-ordinates (while editing graphics), whether the **Ⓢ** key (to switch between block/small letters) or the **Ⓢ** or **Ⓢ** buttons are pressed or not, which character input mode (**INS**ert or **OveR**write) is used, etc.
- The operating window – it is the main window of the display to show the service **MENU** and various parameters and messages, to edit text files, etc.
- The printer status window – contains information about the head status in the printer's various operating modes (p for print, s for stop, the print height, etc.).

4.3. Control MENU

After the printer has been switched on, the control MENU is shown in the operating window on the terminal display. The MENU has a multilevel tree structure. Commands are executed directly at the lowest level. No action is initiated by moving from one menu branch to the other. Only the execution of a command initiates an action such as starting the printing, moving to the word processor, changing parameters, etc.

The first character (a digit or letter) of every MENU item corresponds to the so called **hot key** (see Fig. 4.2.1). When this key is pressed on the keypad, the cursor bar is positioned on the required item.

The following keys are used to move within the MENU tree:

- ⬆ Moves the cursor one menu item upwards.
- ⬇ Moves the cursor one menu item downwards.
- Ⓢ ⬅ or Ⓢ ⬆ - Move the cursor to the first item.
- Ⓢ ➡ or Ⓢ ⬇ - Move the cursor bar to the last item.
- Ⓢ Moves to a lower level in the MENU (to the next MENU branch) or confirms the selection.

[ESC]

Moves to a higher level in the MENU or cancels the selection. When you press the **[ESC]** key several times, it brings you back to the main MENU.

NOTE:

After a command has been confirmed with the **[ENTER]** key, you may not be able to cancel it. Some commands are executed immediately.

4.4. Opening and Editing a New File

Both simple and more complex texts can be printed with EBS printers. They can contain time markers, date, expiry dates (via the so called variable fields). Also barcodes and graphics (either built-in or created by the user with a graphics processor) can be printed. For more details refer to section *Controlling the Printer* in *The EBS-1500 Printer User's Manual*.

Example of how to input a text containing an expiry date and up-to-date time)

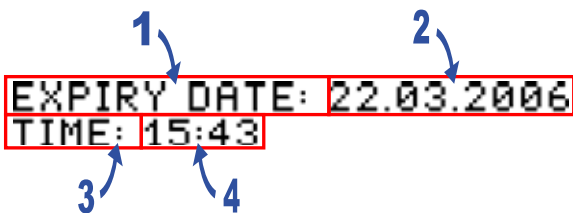
NOTE:

- The expiry date and time, which are shown in the illustrations in the following example depend on the up-to-date settings for date and time in the printer.
- Every aspect of the printer operation procedure is described in the following example.

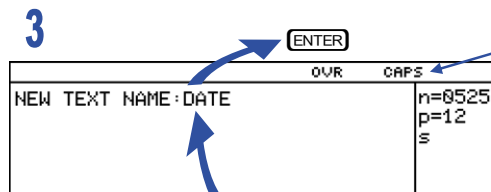
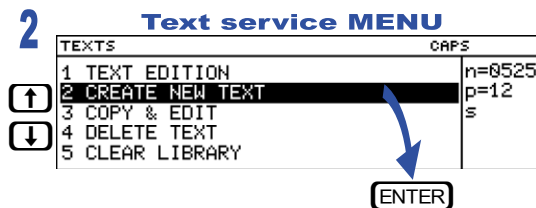
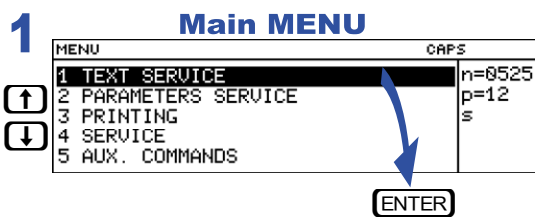
EXPIRY DATE: 22.03.2006
TIME: 15:43

The following text should be printed:

The text file consists of four subfiles:



Two of them (1 and 3 in the figure on the left) are regular **Text** type subfiles, while the other two (2 and 4 in the figure on the left) are also **Text** type subfiles but their contents are updated automatically via variable fields. Subfile 2 contains the expiry date (which is formed by adding a specific offset to the current date – the **Date+offs.** variable field), while subfile 4 contains the current time (the **Time** variable field). The entire text will be printed in Latin 7x5 (every character will be 7 dots high and 5 dots wide).



Block letters are set by default – block/small letters can be switched over with the **[CAPS]** key.

Type in the text name (up to 8 characters – block or small letters, digits and characters excluding / \ : * ? " < > |), e.g. **DATE**.

Word processor - new window (contains 1 space)

4 **CTRL Q** - to switch between two space display modes.

LATIN 7x5 (7x4)	OVR	CAPS
		n=0525
		p=12
		s

(ALT) - national characters
(SHIFT) - characters shown in the top left part of the keys

create subtext 2 on the right of the previous one

5 **(PAR)** - set parameters for subtext 1:

Type : Text, ↔

Char. set : Latin 7x5 ↔

Typeface : Normal

Distance : 2

Rotation : None

Spec.reg. : None

Front dis : 0

Back dist : 0

8 **(PAR)** - set parameters for subtext 2 as for subtext 1 except for:

Spec.reg. : Date+offs.

6

LATIN 7x5 (7x4)	OVR	CAPS
EXPIRY DATE:		n=0525
		p=12
		s

7 **CTRL →**

9

LATIN 7x5 (7x7)	OVR	CAPS
EXPIRY DATE: DA.MO.20YE		n=0525
		p=12
		s

13 **CTRL →**

10 **CTRL ↓**

create subtext 3 below the previous ones

11 **(PAR)** - set parameters for subtext 3; (as for subtext 1).

12

LATIN 7x5 (7x37)	OVR	CAPS
EXPIRY DATE: DA.MO.20YE		n=0525
TIME:		p=12
		s

13 **CTRL →**

14 **(PAR)** - set parameters for subtext 4 as for subtext 2 except for:

Spec.reg. : Time

15

LATIN 7x5 (7x42)	OVR	CAPS
EXPIRY DATE: DA.MO.20YE		n=0525
TIME: 00:00		p=12
		s

NOTE:

If subtexts use variable fields (subtexts 2 and 4), the letters (in the case of date) and digits (in the case of time) will be replaced with values during printing (e.g. DA will be replaced with dozens and units of the month of year, whereas YE with dozens and units of the year).

The above example contains only some of the options that can be used to edit text files. Other useful functions are:

- (SHIFT) ← →** To move the cursor to the first or to the last character in an ASCII subfile.
- (SHIFT) ↑ ↓** To move the entire subfile by one pixel (dot) upwards or downwards.
- (INS)** To switch between two character insertion modes: **INS**ert/**OveR**write.
- (DEL)** To delete a character at the cursor position in a subfile.
- (CTRL) (DEL)** To delete the entire subfile.

4.5. Setting Print Parameters

Before the text prepared in section 4.4 is printed all the required print parameters need to be set. The parameters determine the print rate, the location of the print on objects to be labelled, the direction in which the object moves in front of the print head, the date offset (to set expiry date), etc.

Set the print parameters in the way and to the values presented in the following figures:

1 Main MENU

MENU	CAPS
1 TEXT SERVICE	n=0525
2 PARAMETERS SERVICE	p=12
3 PRINTING	s
4 SERVICE	
5 AUX. COMMANDS	

ENTER

2 Printing MENU

PRINTING	CAPS
2 START PRINT	n=0525
3 QUICK STOP	p=12
4 PRINTING PARAMETERS	s
5 SAVE CURRENT PARAM.	
6 SHIFT COUNTER	

ENTER

The distance from the point where the photo detector has been activated to the point where printing of a text file is start. Printing in the vertical direction. Prints can be made normally or up side down.

The distance between the beginnings of texts (if **Text rpt.** > 1).

Number of printing text repetitions.

The direction (left or right) objects move in front of the print head.

Overprint heigh.

An offset (number of days) from the current date to the expiry date. The parameters are used by variable fields **Date+offs.** and **Date+offs.2.**

Incremental/decremental counter increment/decrement. The parameter is used by the **Up counter** and **Down count.** variable fields.

The number specifying how many times every vertical row will be printed.

Vert. direct.	: UP
Space	: 2,0 mm
Text rpt.	: 1
Rpt.dist.	: 30,0 mm
Direction	: LEFT
Height	: head-specific
Offset	: 100
Offset2	: 1
Counter delta	: 1
Row repetit.	: 1
Intensity	: 70
Generator	: GEN
Resol.dot/dcm	: 60
Cnv spd m/min	: 10,0
Enc const p/m	: 10000
No of Clean Strokes	: 0
Clean. period (sec)	: 300

Ink drops intensity.

The source of timing signals: the internal generator or shaft-encoder.

Character resolution.

The speed at which an object moves in front of the print head if the internal generator is used for timing (**Generator = GEN**).

The number of pulses generated by the shaft-encoder over the distance of 1 metre. Print rate must suit the conveyor travel rate (**Generator = SHAFT**).

The parameters enable the user to print additional complete rows between prints. The objective of such printing is to prevent ink drying in the nozzles if prints are made at long time intervals.

The parameter to be modified is selected with the **↑ ↓** keys. Parameter settings are changed with the **← →** keys or by typing in a setting via the keyboard (this applies to numerical parameters) and confirming with the **ENTER** key. In the example referred to above, the **Offset** parameter needs modifying only. The default settings can be used for the other parameters.

NOTE:

- If the **Generator** parameter is set to **GEN**, the printer will make prints regardless of whether an object moves in front of the print head or not. If the object remains still, the text will be jetted onto one place giving a vertical line only. While testing the printer where an internal generator is used for timing it is advisable to set the **Text rpt.** parameter to a higher value.
- If the **Generator** parameter is set to **SHAFT**, the head will make prints only when a so called shaft-encoder is connected and its axle rotates (for more details on this optional device refer to section *Adjusting the Print Rate* in *The EBS-1500 Printer User's Manual*). If this is the case, there may be the need (especially during trials) to complete the printing of the current text by turning the shaft-encoder axle manually.

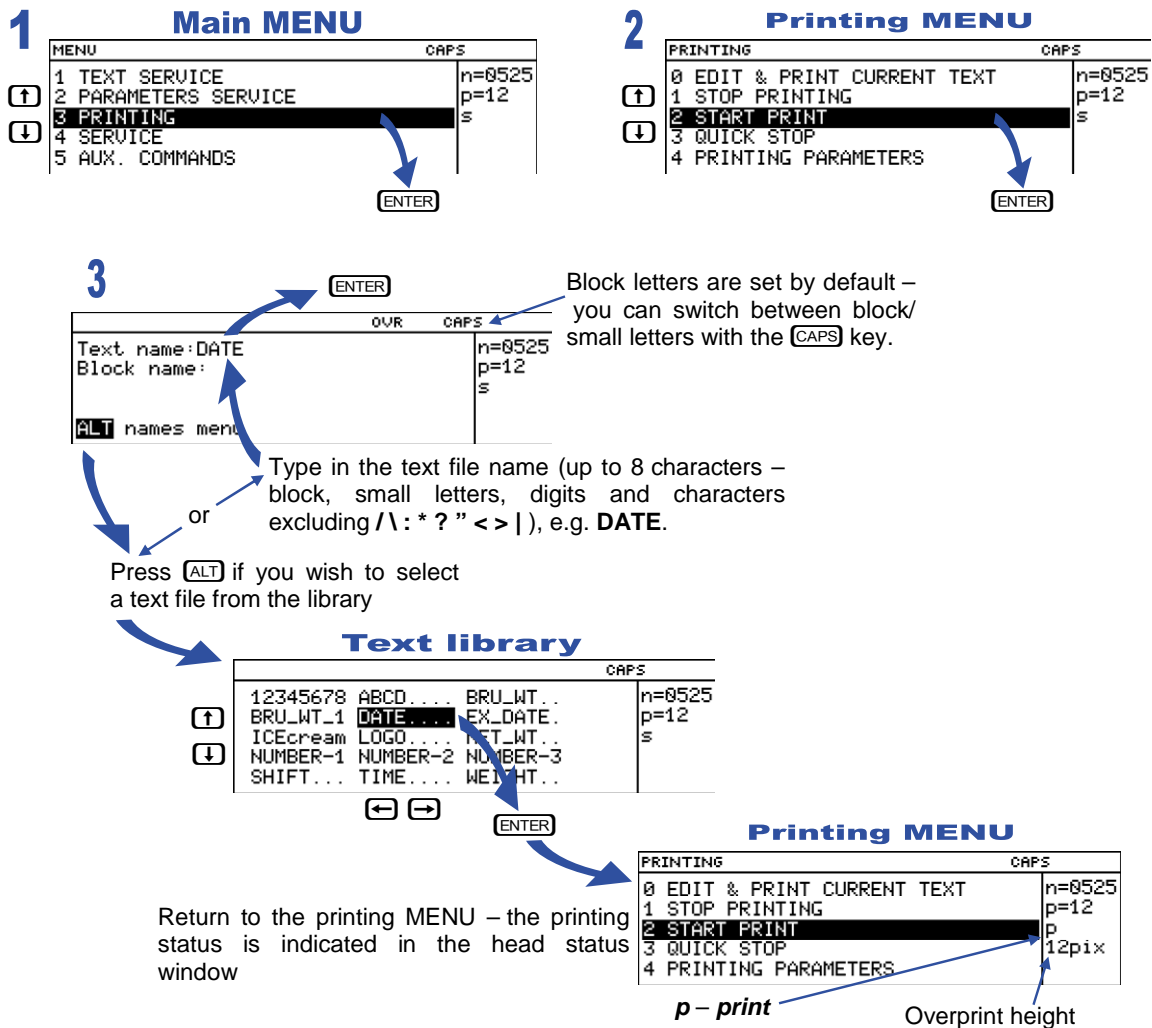
4.6. Printing

4.6.1. Starting the Printing

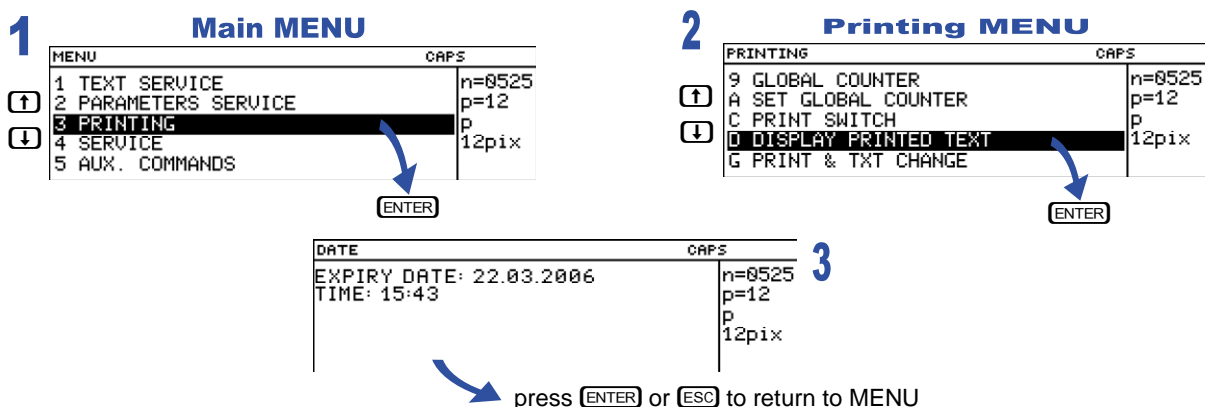
The printing can be initiated in two parallel and independent ways:

- With the **START PRINT** command selected on the terminal (description on the figures).
- With the **PRINT ON/OFF** key on the operation-panel function pad. When the key is pressed, the latest subfile is printed. The key can be used no matter where the cursor is positioned within the control menu (for example, you can start printing while editing a subfile).

In order to print the text file called DATE prepared in the example in section 4.4 follow the step below:



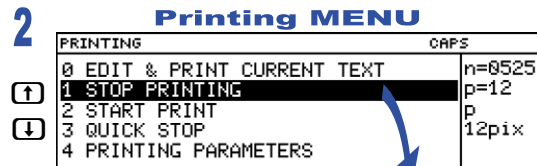
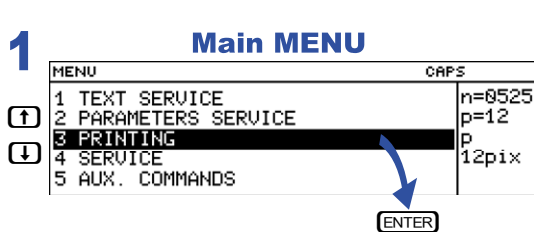
4.6.2. Viewing a File to be Printed on the Terminal Display



4.6.3. Stopping the Printing

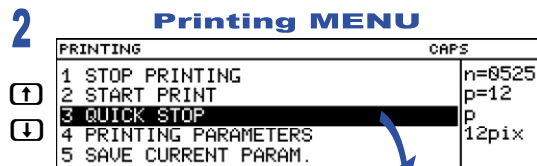
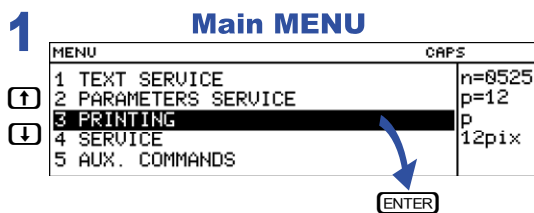
The printing can be terminated in three ways:

- With the **STOP PRINTING** command.



The current text file is printed to the end and the printing is terminated

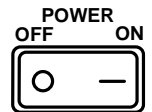
- With the **QUICK STOP** command.



The printing of the current text file is interrupted

- With the **PRINT ON/OFF** key on the operation-panel function pad (when the key is pressed, the **STOP PRINTING** command is executed). The key can be used no matter where the cursor is positioned within the control menu (for example, you can stop the printing while editing a subfile).

4.7. Switching the Printer Off



The printer may be switched off at any time (even during printing). Just switch the Power switch to the **OFF** position.

On switching the unit off protect the heads. You need to do the following.

- depressurise the print head by opening a pressure valve or reducing the pressure to zero with a pressure regulator (item 4 in [Fig. 2.1](#)),
- wash the nozzle plate with solvent.

5. Routine Maintenance

5.1. Replacing Ink Bottle

A low ink level in the ink bottle is signalled with the **INK INK LACK** messages in the terminal operating window. A new bottle of ink should be installed before the ink in the bottle is consumed completely (and the no-ink condition is signalled with the **INK: EMPTY BOTTLE** messages). For more details refer to chapter *Replacing Ink bottle* in *The EBS-1500 Printer User's Manual*. Follow the procedure by performing the steps given below:

1. Prepare a new bottle of ink and then interrupt the printing in the way described in section [4.6.3 Stopping the Printing](#). Depressurise the print head by opening a pressure valve or reducing the pressure to zero with a pressure regulator (item 4 in [Fig. 2.1](#)).
2. Remove the empty bottle (item 2 in [Fig. 2.1](#)) from the container - the following message can be displayed on the terminal: **INK: NO BOTTLE.**
3. Place a new sealed bottle to the container (but do not insert a suction pipe to the bottle). One or more messages may be displayed. If this is the proper bottle, that is, a new bottle that has never been used (or approved) before, the following message should appear at first: **BOTTLE VERIFYING: WAIT 10 SECONDS PLEASE.**
4. If a message **BOTTLE ACCEPTED** is displayed within 10 seconds, it means that the bottle is right for a given printer. In such a case remove the bottle and unseal it. Then put a suction pipe tipped with a filter into the

bottle. Screw the bottle into the cap and place it in the container (a **NO BOTTLE** message can be displayed in the meantime). Set the rated pressure.



5. If no bottle error occurs, the message **NO BOTTLE** should be replaced with the normal status indication in the printer status window. Resume the printing according to paragraph **4.6.1 Starting the Printing**.

5.2. Removing Air from the Print Head

Transport, manipulations to the ink system, or other reasons may result in accumulation of air within the print head. In consequence ink drops are not jetted from some or all nozzles. This is illustrated in the sample on the right.



In order to remove air from the print head, follow the instructions below:

- a). Set the ink pressure to its rating value (0.5 – 10 bar (0.05 - 1.0 MPa)) with a pressure regulator (item 2 in **Fig. 2.1**).
- b). Turn the nozzle outlets towards a dish (which can be used to wash the head, for example).
- c). Press the rinse key  (item 5 in **Fig. 2.1**) at the back of the head housing. This will open all electromagnets within the head to release air bubbles, which will flow out together with the pressurised ink.
- d). Release the rinse key .
- e). Start printing a sample file and check the quality of printing with every nozzle.