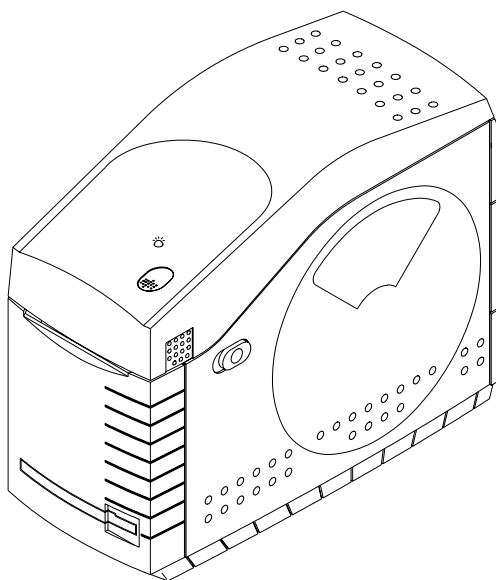


AL-310 SERIES



BARCODE LABEL PRINTER



Operator's Manual



All specifications are subjected to change without notice

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- ◆ FCC Notice
This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates uses, and can radiate radio frequency energy and if not installed and used according to the instruction manual, may cause harmful interference to radio communications.

If this equipment in a residential does cause harmful interference, The user will be required to correct the interference at his own expense.

About This Manual

This User's Manual is divided into five chapters:

- | | |
|-------------------|--|
| Chapter 1 | <i>Getting Started</i> explains how to unpack the unit. |
| Chapter 2 | <i>Command References</i> describes the escape codes and control commands used by AL-310. |
| Chapter 3 | <i>Troubleshooting and Maintenance</i> explains how to resolve common problems and maintain the printer unit. |
| Chapter 4 | <i>Important Information</i> contains the warranty, service information, specifications, and other reference materials. |
| Appendix A | Example of Print Samples contain print samples with its command text. |
| Appendix B | External Dimension contain print out drawing. |

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Chapter 1 Getting Started

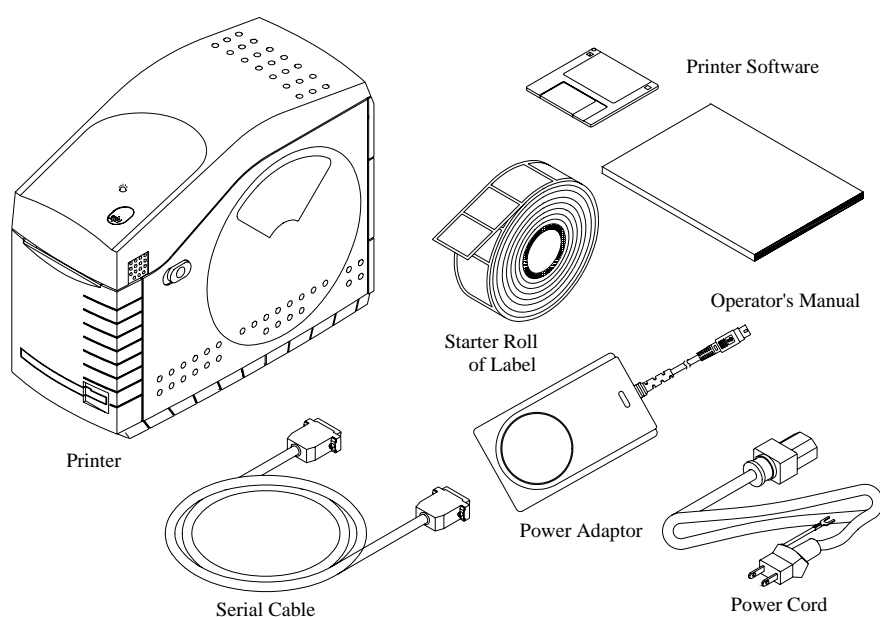
This chapter explains how to unpack and set up the AL-310 and quickly print a label.

Unpacking

Carefully pull out the printer and its components from the box and place them on a flat, sturdy surface.

Note: Save the box and packing materials for future use in transporting or shipping the unit.
Examine the drawing below to familiarize yourself with the components and to make sure that none are damaged or missing.

Figure 1. Accessories of AL-310

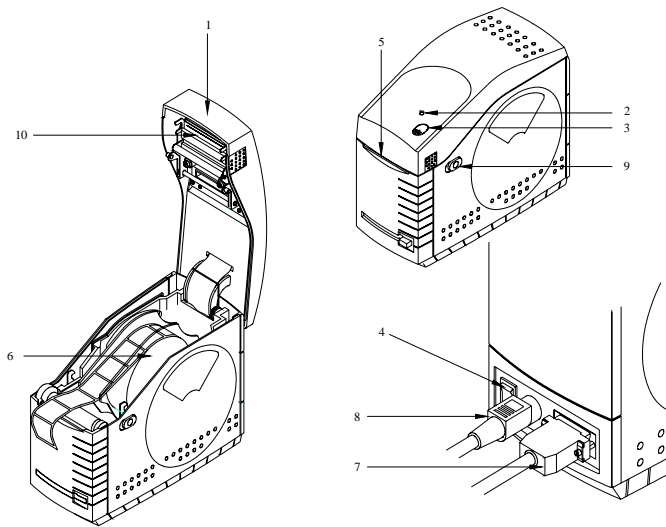


Setting Up AL-310

Component Description

Use the following diagram to familiarize yourself with the unit's features and components.

Figure 2. Component Description

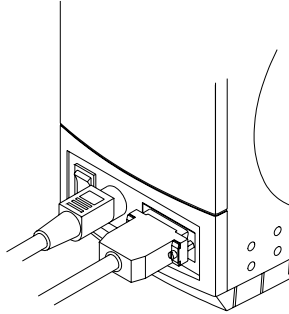


- | | |
|------------------------------------|---|
| 1. Top cover | Protects the internal components of the unit. |
| 2. Power Light | Indicates whether the power is on or off lights steadily when the power is on.
Flashes to indicate an error condition. |
| 3. FEED Button | Manually feeds Labels or adjusts Label position. |
| 4. POWER Switches | Switches the unit power on/off. |
| 5. Label Cutting Bar | Cuts the printed Labels off. |
| 6. Label Spindle | Holds the Label roll. |
| 7. Serial Connector | Plugs the serial cable into the unit. |
| 8. Power Jack | Connects the power cord to the unit. |
| 9. Print Head Release Lever | Lifts up to release lever jams when the top cover is removed or cleaning the print head. |
| 10. T.P.H. | Thermal Print Head |

Connecting Unit to Your Computer

The AL-310 can be easily connected to your computer with the serial cable provided. Refer to the below figure to make the serial cable connection.

Figure 3. Connecting the unit to your computer



To connect unit to your computer:

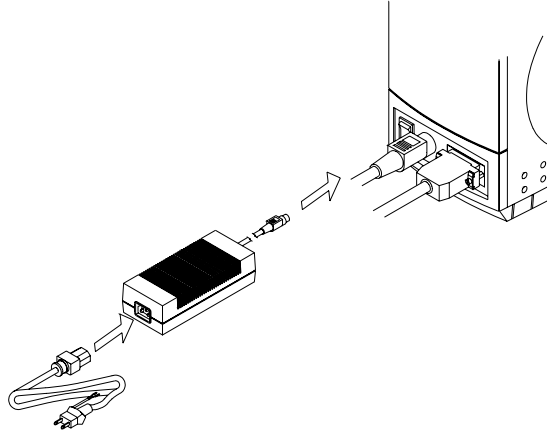
1. Turn off the power of your computer and the AL-310.
2. Insert the serial connector end of the serial cable into the serial port at the backside of the AL-310.
3. Choose the one pin of connector (9 pin) on the serial cable that matches the serial port on your computer. Plug the correct connector into the serial port (**COM1, COM2, COM3, or COM4**) on your computer.

Note: If you are unfamiliar with serial ports, see the provided manual with your computer.

Connecting the Power Adapter

Before connecting unit to the power source, check the voltage and frequency of the outlet. Nonstandard power sources may cause fatal harm to the unit. Refer to the following figure to connect the adapter.

Figure 4. Connecting the Power Adapter



To connect the power adapter:

1. Plug the power cord into the power jack at the back of the unit.
2. Plug the adapter into a power outlet.
3. Press the **POWER** switches to turn the unit on. If everything is completely connected, the green light of LED will light up.
The power light will blink to indicate that there are no Labels in the printer.

Using Labels

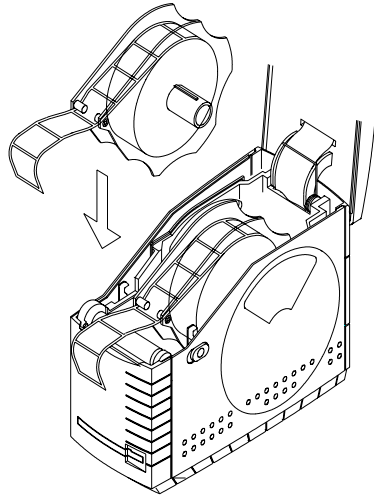
Your unit employs the latest direct thermal printing technology to provide crisp, high-resolution printing every time.

Since the Labels themselves are specially formulated for thermal printing, ribbons or cartridges are unnecessary.

Loading a Label Roll

Your AL-310 Printer makes loading Labels an easy task with its manual Label feed feature. Refer to the below figure when loading Label roll.

Figure 5. Loading a Label Roll



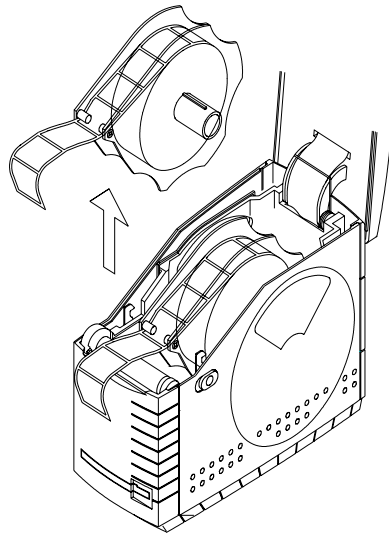
To load a roll of Label:

1. Use the **POWER** switches to turn the unit off. The power light will go out.
2. Lift the unit's top cover and remove the Label spindle.
3. Hold the Label spindle in both hands and gently pull it apart.
Remove the used cardboard Label core, if necessary. Load the new roll of Label onto the Label spindle and snap the spindle back together.
4. Press the **POWER** switch to turn the unit on. The power light will start blinking.
5. Replace the spindle in the unit and lower the top cover.

Removing a Label Roll

You can easily change your Label roll when you want to print using a different color or size Label.

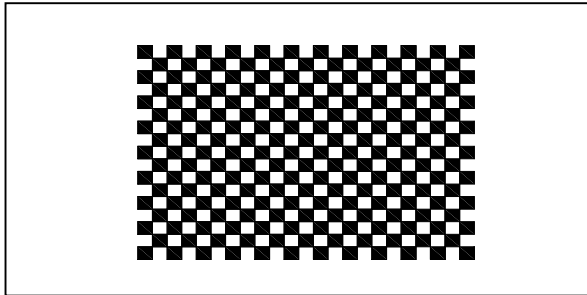
Figure 6. Removing a Label Roll



Self-diagnostic the AL-310

The AL-310 includes a Self-diagnostic feature to check for proper printer operation. To use the Self-diagnostic feature:

1. Press the **FEED** button to turn the unit off.
2. Press the **POWER** switch to turn the unit on.
3. The unit will print a test Label as shown below.
4. Examine the test Label. The printing should be dark and uniform with no distortion. If the results differ markedly from those expected, refer to the **Trouble shooting** section in this manual.



Chapter 2 Command References

Overview

This chapter describes the commands used to create label formats.

A convenient and quick way to design a label and create its command file was introduced in chapter 2. (See Chapter 2, section, “Creating the command file by using the Quick Label Program”)

You can easily create the command file by using the Quick Label program instead of using Command References, when designing labels with complex formats.

Commands described here contain information about simple references basic syntax and terminology.

You may refer to “Examples of Print Sample” in Appendix to understand function and syntax of commands.

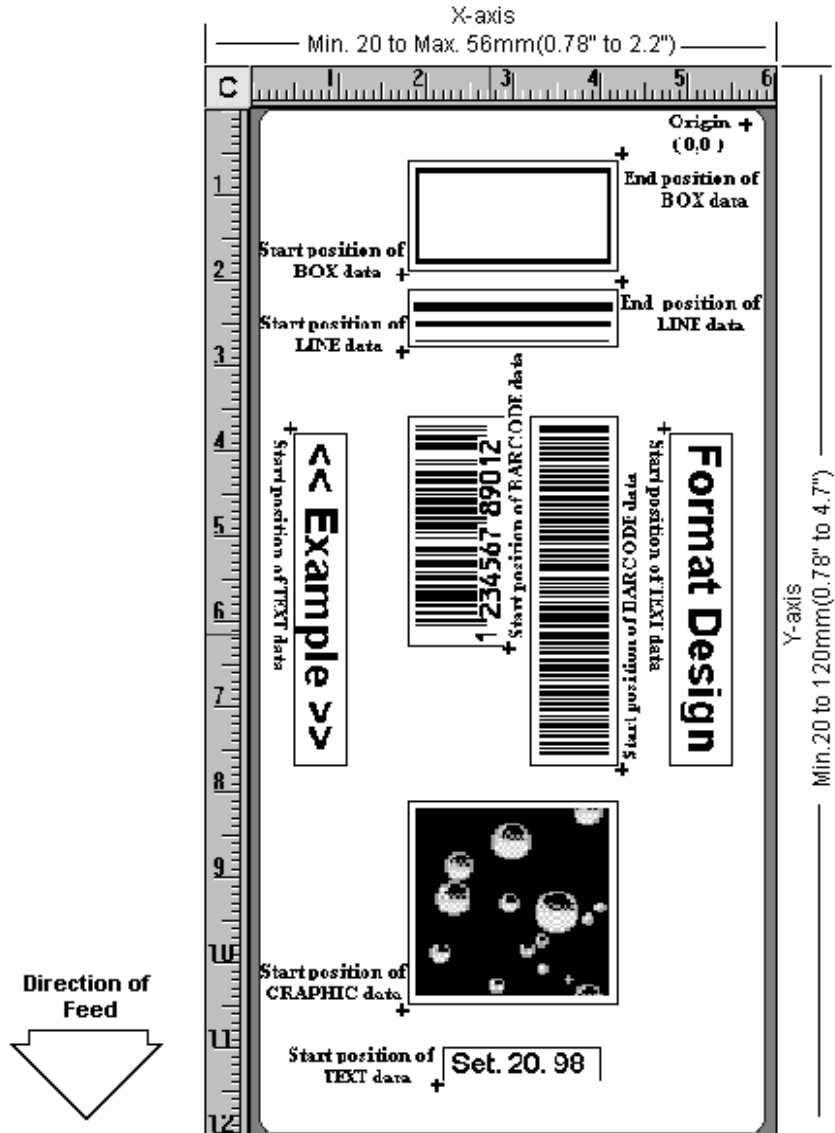
For more detailed information of commands, you may also refer to the “Commands Manual”.

Label Format

When placing objects in the image buffer for printing, the address locations are expressed in unit of 0.1mm on an X,Y grid. The X value represents the width and the Y value represents the height of the grid.

The point of origin (the starting point) for a non-rotated object is the bottom left corner. These properties are depicted graphically in the following illustrations.

Figure 20. Label Format



Basic Command Syntax

Each command consists of 3 major parts, which are Command, Header and Data. All data must be written by ASCII code.

Each command must be started with “{“ (7B) and terminated with “}” (7D), and each parameters are separated with delimiters.

Basic syntax

{ COMMAND, HEADER | DATA | DATA | ... | }

Delimiters

SYMBOL	ASCII	CONTENTS
,	2C	Delimiters between parameters
;	3B	Delimiters between parameters and name
	7C	Delimiters between Header and Data

Summary of Command

SYMBOL	COMMAND
F	Format Command & Print Image Buffer Clear
G	Graphic Command
I	Bit Image Command
C	Graphic Clear Command
X	Bit Image Buffer Clear Command
B	Batch Command
P	Printer Status Request Command
D	Print Density Control Command
N	Print Speed Control Command

FORMAT COMMAND

Function	Used to define all information about desired label format
----------	---

Syntax

$\{ \text{FNNN, LLLL, WWW; FFFFFFFF} \mid \text{DATA} \mid \text{DATA} \mid \dots \mid \}$	
<div style="border-top: 1px solid black; width: 100%;"></div> Header	<div style="border-top: 1px solid black; width: 100%;"></div> Data Fields
Format command	
Start of command	End of command

Header

ITEM	DESCRIPTION	VALUE
Format Number (<i>NNN</i>)	Identification number of the format	1 – 999
Label Length (<i>LLLL</i>)	Total length of the format	200 – 1200
Label Width (<i>WWW</i>)	Total width of the format	150 – 560
Format Name (<i>FFFFFFFF</i>)	Identification name of the format	1 – 8 digits of alphanumeric characters

Data Fields

Data of Format command specify the characteristics of text string, barcode, line and box to be printed on a label, and it is composed of 4 types of data.

T : TEXT DATA

B : BARCODE DATA

L : LINE / BOX DATA

G : GRAPHIC DATA

TEXT DATA

Function Used to print an ASCII text string

Syntax

| *TP1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12* |

Parameter

PARAMETER	ITEM	DESCRIPTION	VALUE
P1	Number	Identification number of each text data	1 – 99
P2	Increment / Decrement of numeric data	Increments or decrements numeric data (from “0” to “9999”) I ; Increments numeric data D ; decrements numeric data	I or D
P3	Increment / Decrement step	Increment or decrement step size	0 – 999
P4	Start position in Y	Vertical start position (Unit ; 0.1mm)	10 – 1200
P5	Start position in X	Horizontal start position (Unit ; 0.1mm)	10 – 560
P6	Magnification Factor	<u>XX YY</u> Vertical multiplier Horizontal multiplier	(1 – 09) (1 – 09)
P7	Font Selection	No. TYPE SIZE 1 STANDARD 16x24 2 REDUCED 8x16 3 BOLD 32x48 4 TERA 16x32 5 OCR__B 24x32 6 HR__1 16x24 7 HR__2 12x16 8 NORMAL__A 16x24 9 NNORMAL__B 24x20 U PF 6x7 A U.S.A 12x24 B JAPAN 12x24 C GERMAN 12x24 D ENGLAND 12x24 E FRANCE 12x24 F SPAIN 12x24 G ITALY 12x24 H SWEDEN 12x24 K GOTHIC 12x24	1- 9, U, A ~ K

PARAMETER	ITEM	DESCRIPTION	VALUE
<i>P8</i>	Rotation of character	0 ; No rotation 1 ; 90 degree (counterclockwise)	0, 1
<i>P9</i>	Rotation of character Row	0 ; No rotation 1 ; 90 degree (counterclockwise) 2 ; 180 degree(counterclockwise) 3 ; 270 degree(counterclockwise)	0 - 3
<i>P10</i>	Normal / Reverse	B ; Normal W; Reverse	B or W
<i>P11</i>	Increment / Decrement of character gap	I ; Increments gap between characters D; Decrements gap between characters	I or D
<i>P12</i>	Increment / Decrement gap size	Increment or decrement gap size	1 -9

BARCODE DATA

Function Used to print standard barcodes

Syntax | B *P1, P2, P3, P4, P5, P6, P7, P8, P9, P10* |

Parameters

PARAMETER	ITEM	DESCRIPTION	VALUE
<i>P1</i>	Number	Identification number of each barcode data	1-99
<i>P2</i>	Increment / Decrement	Increments or decrements numeric data (from "0" to "9999") I : Increments numeric data D : Decrements numeric data	I or D
<i>P3</i>	Increment / Decrement step	Increment or decrement step size	0-999
<i>P4</i>	Start position in Y	Vertical start position (Unit : 0.1mm)	10-1200
<i>P5</i>	Start position in X	Horizontal start position (Unit : 0.1mm)	10-560
<i>P6</i>	Density	UPC-A, UPC-E, EAN-8, EAN-13 : (Unit = dot, 1dot = 0.125mm) (NB) (WB) (NS) (WS) (ICG) Density = <u>1 2 8 2 8 --</u> <u>3 3 12 3 12 --</u> <u>4 4 16 4 16 --</u>	1, 3, 4
		I 2 OF 5 : (Unit=dot, 1dot=0.125mm) (NB) (WB) (NS) (WS) (ICG) Density = <u>5 2 6 2 6 --</u> <u>2 2 5 2 5 --</u> <u>8 2 4 2 4 --</u>	5,2,8
		NW7 : (Unit=dot, 1dot=0.125mm) (NB) (WB) (NS) (WS) (ICG) Density = <u>8 2 4 2 4 2</u> <u>A 2 6 2 6 2</u> <u>3 2 5 2 5 2</u>	8, A, 3
		CODE39 : (Unit=dot, 1dot=0.125mm) (NB) (WB) (NS) (WS) (ICG) Density = <u>8 2 4 2 4 2</u> <u>3 2 6 2 6 2</u> <u>4 2 5 2 5 2</u>	8, 3, 4

<i>P7</i>	Symbologies	No. Barcode symbology 1 UPC A 2 UPC E 3 I 2 OF 5 4 CODE39 5 NW7 6 EAN 8 7 EAN 13 8 CODE 128(Auto) 9 CODE 128A 10 CODE 128B 11 CODE128C	1-11
<i>P8</i>	Rotation	0 ; Fence type 1 ; Ladder type	0 or 1
<i>P9</i>	Height	Barcode height (Unit = 0.1mm)	80-350
<i>P10</i>	Human readable character	0 ; NO 1 ; YES (Upper side) 2 ; YES (Bottom side) Acceptable on EAN-13, EAN-8, UPC-A and UPC-E	0-2


LINE AND BOX DATA

Function Used to draw lines and boxes

Syntax | *LP1, P2, P3, P4, P5, P6, P7* |

Parameters

PARAMETERS	ITEM	DESCRIPTION	VALUE
<i>P1</i>	Number	Identification number of line data	1 - 99
<i>P2</i>	Start position in Y	Vertical start position (Unit; 0.1mm)	10 - 1200
<i>P3</i>	Start position in X	Horizontal start position (Unit; 0.1mm)	10 - 560
<i>P4</i>	Direction	0 ; Horizontal Line 1 ; Vertical Line B ; Box	0, 1, B
<i>P5</i>	Length of LINE	Vertical length (Unit; dot) (when drawing vertical line and box) Horizontal length (Unit; dot) (when drawing horizontal line)	8 – 960dot 8 – 448dot
<i>P6</i>	Thickness	Thickness of line and box (Unit; dot)	2 – 9 dot
<i>P7</i>	Length of BOX	Horizontal length (Unit; dot)	8 – 448dot

 How to calculation of dots: 1 dot = 0.125mm, 1mm = 8dots

Function	Used to print graphic data stored in memory
Syntax	<i>GP1, P2, P3</i>

Function

Used to print graphic data stored in memory

Syntax

 $| GP1, P2, P3 |$

Parameters

PARAMETERS	ITEM	DESCRIPTION	VALUE
<i>P1</i>	Number	Identification number of graphics Data	10-99
<i>P2</i>	Start position in Y	Vertical start position (Unit ; 0.1mm)	10 – 300
<i>P3</i>	Start position in X	Horizontal start position (Unit ; 0.1mm)	10 – 300

GRAPHIC COMMAND

Function

Used to store graphic files in memory

































Syntax:


{ G NNN, 0, 0, YYYY, XXX DATA DATA }	
<div style="text-align: center;"> <div style="display: inline-block; width: 40%; border-top: 1px solid black; margin-bottom: 5px;"></div> <div style="display: inline-block; width: 60%; border-top: 1px solid black; margin-bottom: 5px;"></div> </div>	
Header	Data Fields
Graphic command	End of command
Start of command	


Header

ITEM	DESCRIPTION	VALUE
Number (N/N)	Identification number of graphic data to be stored in memory	10-999
Vertical Size (YYYY)	Vertical size of graphic file (Unit ; 0.1mm)	10-300 (Max.)
Horizontal Size (XXX)	Horizontal size of graphic file (Unit ; 0.1mm)	10-300 (Max.)





Data Fields

DATA	UNIT	DISPLAY	DATA	UNIT	DISPLAY	Remark
A ~ Z	BITS		a ~ z	BITS		
A	1		a	1		
B	2	 	b	2	 	
C	3	  	c	3	  	
D	4	   	d	4	   	
.	
.	
.	
.	
X	24	 ... 	x	24	 ... 	
Y	25	 ... 	y	25	 ... 	
Z	26	 ... 	z	26	 ... 	

 : Black

 : White

Example 1

<code>;AAAAAAAAAA </code>	<code>=</code>	<code>;K </code>	<code>=</code>	
<code>;AaAaAaAaAa </code>	<code>=</code>		<code>=</code>	
<code>;BbBbB </code>	<code>=</code>		<code>=</code>	
<code>;aaaaaaaaa </code>	<code>=</code>	<code>;k </code>	<code>=</code>	

Example 2

	Command
	{ G10,0,0,13,20
	;u
	;bDdBbBf
	;bDdBbBf
	;bDdBbBf
	;bDdBbBf
	;bHbBf
	;bHbBf
	;bDdBbBf
	;bDdBbBf
	;bDdBbBf
	;bDdBbFb
	;bDdBbFb
	;u
	}

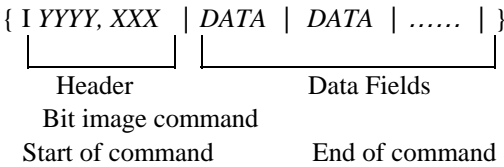
GRAPHIC CLEAR COMMAND

Function	Used to clear graphic data stored in memory
Syntax	{CP1} Graphic Clear command
Parameter	P1 = Number of graphic data to be deleted from memory

BIT IMAGE COMMAND

Function	Used to store bit image data in memory
----------	--

Syntax :



Header

ITEM	DESCRIPTION	VALUE
Start Position in Y (YYYY)	Vertical size of graphic file (Unit ; 0.1mm)	10-300 (Max.)
Start Position in X (XXX)	Horizontal size of graphic file (Unit ; 0.1mm)	10-560 (Max.)





Data Fields

DATA	UNIT	DISPLAY	DATA	UNIT	DISPLAY	Remark
A ~ Z	BITS		a ~ z	BITS		
A	1	■	a	1	□	
B	2	■ ■	b	2	□ □	
C	3	■ ■ ■	c	3	□ □ □	
D	4	■ ■ ■ ■	d	4	□ □ □ □	
.	
.	
.	
.	
X	24	■ ... ■	x	24	□ ... □	
Y	25	■ ... ■	y	25	□ ... □	
Z	26	■ ... ■	z	26	□ ... □	

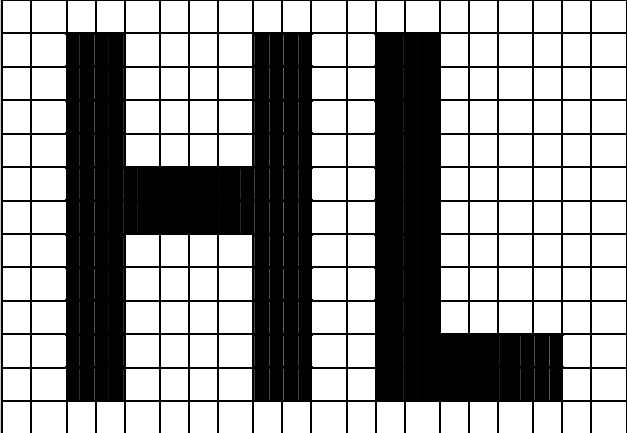
■ : Black

□ : White

Example 1

;AAAAAAAAAA	=	;K	=	
;AaAaAaAaAa	=		=	
;BbBbB	=		=	
;aaaaaaaaa	=	;k	=	

Example 2

	Command
	{ G10,0,0,13,20
	;u
	;bBdBbBf
	;bBdBbBf
	;bBdBbBf
	;bBdBbBf
	;bHbBf
	;bHbBf
	;bBdBbBf
	;bBdBbBf
	;bBdBbBf
	;bBdBbFb
	;bBdBbFb
	;u
	}

BIT IMAGE BUFFER CLEAR COMMAND

Function	Used to clear graphic data stored in memory
Syntax	{X}
	Bit Image Buffer All Clear command

BATCH COMMAND

Function	Used to specify options when printing and to designate data to be printed.
----------	--

Syntax

$\{ \text{B } \underline{NNN}, \underline{QQQ}, \underline{E}, \underline{CC}, \underline{P}, \underline{I}, \underline{C}, \underline{M}; \text{BBBBBBBBB} \mid \text{DATA} \mid \text{DATA} \mid \dots \mid \}$	
<div style="border-top: 1px solid black; width: 100%;"></div>	<div style="border-top: 1px solid black; width: 100%;"></div>
Header	Data Fields
Batch command	End of command
Start of command	

Header

ITEM	DESCRIPTION	VALUE
Number (<i>NNN</i>)	Identification number of Batch command This number must be same as number of format to be printed.	1-999
Number of labels to be Printed (<i>QQQ</i>)	Number of labels	1-9999
<i>E</i>	Reserved	0
Number of copies of each Label (<i>CC</i>)	Number of copies of each label	1-99
Duplication of the label (<i>P</i>)	Duplication of the label in horizontal direction	1, 2, 3
Rotation (<i>I</i>)	0 ; Normal 2 ; Rotation (180 degree)	0, 2
<i>C, M</i>	Reserved	0,0
Name (<i>BBBBBBBB</i>)	Name of Batch command	1 - 8 digits of alphanumeric characters

Data Fields

Text data

Function;	Used to print Text data
Syntax;	TP1, DATA
Parameter;	P1 = Same as format number
Data;	ASCII Text data to be printed

Barcode data

Function;	Used to print Barcode data
Syntax;	BP1, DATA
Parameter;	P1 = Same as format number
Data;	Barcode data to be printed

Print Density Control Command

Function Used to print density control.
Default value is 5.

Syntax {D,*PI*}

Parameters

PARAMETERS	ITEM	DESCRIPTION	VALUE
<i>PI</i>	Number	Identification number of print density 1 to 3 : Low density 4 to 6 : Mid density 7 to 9 : High density	1 – 9

Print Speed Control Command

Function Used to print speed control.
Default value is 3.

Syntax {N,*PI*}

Parameters

PARAMETERS	ITEM	DESCRIPTION	VALUE
<i>PI</i>	Number	Identification number of print speed 1 : 30mm/sec 2 : 40mm/sec 3 : 50mm/sec	1 – 3

Print Out Command

Function Used to print out control.

Syntax {T}

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Chapter 3 Troubleshooting and Maintenance

This chapter explains how to respond to problems that may arise while using the AL-310, and describes basic maintenance procedures.

Clearing Label Jams

If Labels become lodged in the printer unit, printer operation will stop and the red light of LED will flash and buzzer beeps.

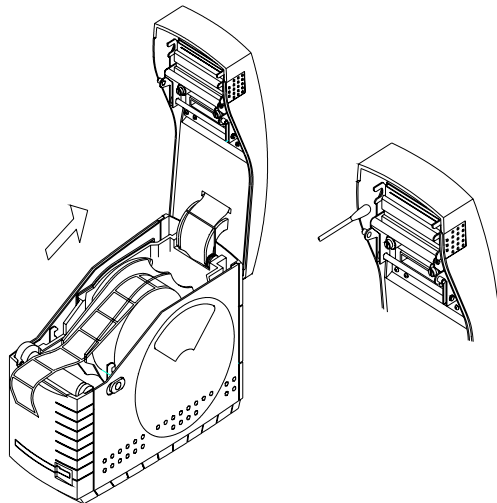
Warning:

The print head will become hot during printing.
Turn off the unit and allow the print head to cool for several minutes before reaching into the printer area for any reason.

To dislodge a Label jam:

1. Use the **POWER** switch to turn the unit off.
2. Separate the power cord and the serial cable from the unit.
3. Move the print head release lever to the upright position as shown below. Open the top cover and remove the Label roll by tearing off the Labels, then close the top cover.
DO NOT PULL LABELS BACK OUT OF THE FEEDER, OTHERWISE DAMAGE MAY OCCUR TO THE PRINTHEAD.

Figure 21. Clearing Label Jams



4. Reconnect the power cord and serial cable.
5. Reload the Labels as described in **Getting Started**.

Troubleshooting Guide

The most common problems in printer can be resolved quickly and easily. Check the following lists before calling for service.

Printer Does Not Print

- Is the unit power on?
- Is the power plug connected?
- Is the printer connected to the computer using the serial cable provided?
- Are all plugs firmly plugged in?
- Is the unit connected to the correct serial port?
 - Try connecting to other COM ports.
 - See About Serial Ports.
- Does the Label size match the actual Label?
 - Try to turn the power off and on again, then match the setting to turn with the Label.
- If the printer still fails to print, take self-diagnostic described in **Getting Started**.
- If the self-test operates correctly, try to use another cable or contact your dealer for assistance.

Printer Stops While Printing

- Is the unit power on?
- Is the power plug in securely?
- Is the serial cable connected properly?
- Are you out of Labels?
 - See **Getting Started** for instructions on replacing the Label roll.
- If the printer still fails to begin printing, conduct the self-test described in **Getting Started**.

Important: If the self-test fails, separate the power supply from the power source. Otherwise, irreparable damage may occur in the printer.

All Text Printed on One Line

Is the top cover in place or is it affecting the Label feed?

Is something jammed between the rubber roller and the gear?

Remove the top cover as instructed in **Clearing Label Jam**, then gently rotate the gear parts to remove the jammed material.

Is there a Label stuck to the rubber roller?

See **Clearing Label Jam**.

If the problem is not due to the above reasons:

Unplug the power cord, then reconnect.

Conduct the self-test described in **Getting Started**.

Unbalanced Printing

Most unbalanced printing is caused by a misalignment Label guide when using standard size Labels, or because of an incorrectly fed Label at first.

Try to reload the Labels according to the instructions in **Getting Started**.

Abnormal Self-Test Results

Is printing quality unacceptable for part of the Label?

The print head may need cleaning.

See **Cleaning the Print Head**.

Is the image stretched or compressed?

There may be a Label jam.

See **Clearing Label Jam**.

Are dotted lines or blocks not printed?

The print head may be damaged.

Contact your dealer for assistance.

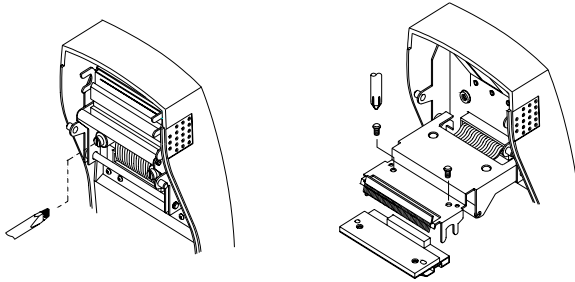
Printer Maintenance

Please keep your printer in a clean and , safe place. Avoid:

- Top, oil, or humidity
- Heaters or direct sunlight
- Large electrical equipment

How to change the thermal print head as shown below.

Figure 22. Changing the Thermal Print Head



Cleaning the Printer

Clean the printer about once every three months. Unplug the power cord and remove the Label roll.

Use a small vacuum cleaner with a pointed end to clean the printer.

Remove all Label residues thoroughly.

If you have just printed a Label, make sure the print head cooled before cleaning.

Be careful not to damage the internal components of the printer while cleaning.

If the outer case of the printer is dirty, wipe with a soft cloth dampened with a solution of detergent and water.

Close the top cover to prevent water from getting into the printer. Do not use a rough brush or cloth.

Do not use alcohol or thinners, which damage the printer case.

Caution:

Do not get water into the case. It may damage delicate internal components.

Cleaning the Print Head

If you are dissatisfied with printing quality, you may wish to clean the print head as described below.

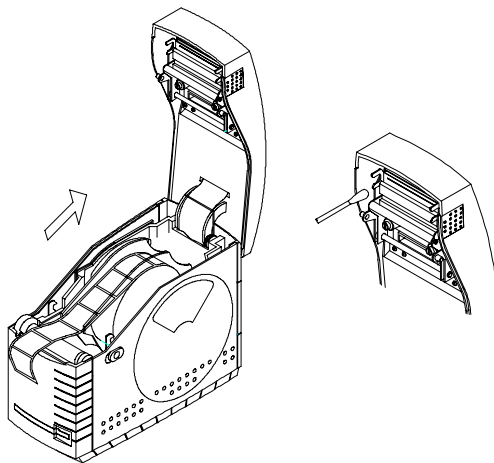
Warning:

The print head will become hot during printing.
Turn the unit off and allow the print head cooled for several minutes before reaching into the printer area for any reason.

To clean the print head:

1. Use the **POWER** switch to turn the unit off.
2. Separate the power cord and the serial cable from the unit.
3. Open the top cover and remove the Label roll.
4. Move the print head release lever to the upright position as shown below.

Figure 23. Cleaning the Printer Head



5. Wipe the print head with a soft cloth or cotton swab soaked in alcohol.

Caution:

Be careful not to scratch the surface while wiping the print head.
If the head surface is damaged, printing quality will suffer.

6. Replace the top cover.

7. Reconnect the power cord and serial cable.
8. Reload the Labels as described in **Getting Started**.
If the above measures do not result in an increase in printing quality, or if printing quality worsens, stop and contact your dealer.

Chapter 4 Important Information

Packing Instructions

Should you find it necessary to ship your unit, follow the instructions listed below. SAMSUNG ELECTRONICS is not responsible for shipping damages.

Important:

When the unit is to be shipped for any reason, it must be well protected from shipping and handling hazards.

Use original packing material to pack the unit.

To pack the unit:

1. Use the **POWER** switch to turn the unit off.
2. Unplug the adapter and remove the power cord from the unit.
3. Disconnect the serial cable from the serial connector and disconnect the connector from your computer.
4. Remove the Label roll.
5. Place the unit in the original box using the original packing material.
6. Tape the box shut. It is recommended that you use filament tape or 2" wide plastic tape.
7. Address the package in large letters for shipment to the nearest service location. Remember including your return address.

Note: If the original packing box and material are not available, use a sturdy box and pack the unit with at least 2 inches of packing material around each side. Seal and address as noted above.

Safe Operating Recommendations

To avoid unnecessary injury or damage to the unit, please review the following recommendations.

Warning:

To reduce risk of fire or electrical shock, DO NOT expose unit to rain or moisture.

- **USE THE CORRECT ELECTRICAL VOLTAGE** - Avoid electrical short

circuit, overheating or shocks.

Check the electric rating Label affixed to the unit. The wrong voltage could cause damage to the unit, possible overheating or shocks.

- **AVOID ELECTRICAL SHOCK** - Never insert metal objects such as screwdrivers, Label clips or nail files inside the unit.
- **BEFORE REACHING INTO THE LABEL FEEDER AREA**, always turn the power off.
- **DO NOT COVER OR PLACE ANY OBJECTS** on the unit when the power is on.
- **IF THE UNIT IS DROPPED**, the insulation system may be disturbed. Unplug the power cord before picking up the unit. Have the unit checked by a qualified service technician before using it again.
- **TEMPERATURE AND HUMIDITY** Avoid placing the unit near an excessively warm or humid location.
- **BEFORE CLEANING**, make sure that the unit is turned off and unplugged.
- **PLUG** the power cord into an outlet, which is nearby and easily accessible.
- **KEEP FINGERS, HAIR, AND JEWELRY** away from the Label feeder area.
- **THE PRINT HEAD WILL BECOME HOT DURING PRINTING** - Turn off the unit and allow the print head cooled for several minutes before reaching into the printer area for any reason.
- **YOUR PRINTER CONTAINS DELICATE ELECTRONIC.**
- **COMPONENTS** - Be careful not to disturb these components when removing the upper housing to clean the print head or to clear Label jam.

About Serial Ports

The serial cable used by the AL-310 is included with the unit.

If there seems to be a problem with the serial port, check the following:

- Is the serial cable firmly plugged into the interface connector at the back of the Label Printer?
- Is the other end of the serial cable firmly plugged into the serial port of the computer?

- Is it plugged into the correct serial port set in the Label Printer for DOS or Windows program?
- Is another serial device, such as a mouse, fax/modem board, scanner and etc. installed on the computer?

It may happen to use the same interrupts as the Label printer port, which will cause a problem.

COM1 and COM3 share interrupts, and COM2 and COM4 share interrupts.

A serial device using COM1 cannot be used in conjunction with a serial device using COM3.

The same holds true for COM2 and COM4. If a mouse is using COM1, install the Label Printer on COM2, or vice versa.

If another serial device besides a mouse is already using COM1 or COM2, try to move it to COM3 or COM4 to avoid interfering with the AL-310.

Refer to the serial device manual to redefine the interrupts, or have a qualified technician do this for you.

The following table shows serial port specifications for the IBM PC or fully compatible systems.

If you do not have a fully compatible system, check the values in the table to see if you can use the AL-310 with your system.

If you are not familiar with serial ports, consult a qualified technician for assistance.

Standard Address, IRQ's, and Vectors for COM1 through COM4			
Port	Address	IRQ	Vector
COM1	3F8H	4	0CH
COM2	2F8H	3	0BH
COM3	3E8H	4	0CH
COM4	2E8H	3	0BH

Connector Pin Assignments

Serial Cable Connection Schematic

Host side			Printer side	
Description	Pin No.		Pin No.	Description
DCD	1	NC	1	DCD
RxD	2	←→	3	TxD
TxD	3	←→	2	RxD
GND	5	←→	5	GND
DTR	4	←→	6	DSR
DSR	6	←→	4	DTR
RTS	7	7,8 Common 7,8 Common	7	RTS
CTS	8		8	CTS
RI	9		9	RI

Specifications

Printer	
Model	AL-310
Dimensions	Height : 180mm (7.08") Width : 100mm (3.93") Depth : 220mm (8.66")
Weight	2.5Kg (with Adapter), Net:1.5Kg
Power Adapter	Input: 100 ~ 250VAC, 50 ~ 60Hz Output: +24VDC, 2.3A, Peak 3.5A

Interface			
Type	Bi-directional, serial RS-232C using transmit, Receive and ground		
Communication	Protocol	Xon / Xoff	Fixed
	Baudrate	38400 BPS	Fixed
	Data bits	8 bits	Fixed
	Parity	No parity	Fixed
	Stop bits	1 stop bit	Fixed

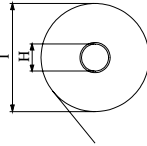
Print Head	
Model	Fixed 56mm (2.2") wide linear thermal head
Head Life	Approximately 18.6 miles of Label Print head is replaceable

Printing	
Method	Direct thermal
Graphics Resolution:	203 × 203 dots per inch (203 DPI)

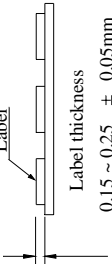
Label Specification
Applicable Model : SRP-700 & SRP-750

Label description			
Item	Measure		Remark
A	22 ~ 59.5	- 0.50mm	Backing paper width
B	20 ~ 57.0	- 0.50mm	Label width
C	20 ~ 120	- 0.10mm	Label length
D	1.0 ~ 2.0	± 0.50mm	Left/Right margin
E	Fixed 3.0	± 0.10mm	Label & Label gap
F	R 3.0	± 0.50mm	Round edge
G	White		Backing paper color
H	Fixed 27.0	+ 0.50mm	Stocks roll core inner DIA.
I	Max. 120	- 1.00mm	Stock roll out DIA.


Stocks roll description




Label thickness



Stocks roll ass'y



Backing paper thickness

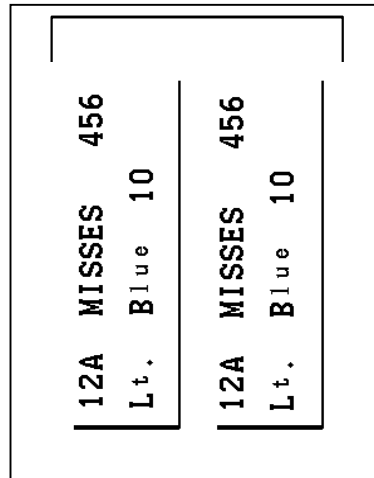


A-1 Text and Line data

```

{D5}
{N3}
{F01,0760,0560;FORMAT01|
T01,I,000,0130,080,0101,1,0,1,B,I,0|
T02,I,000,0265,080,0101,1,0,1,B,I,0|
T03,I,000,0480,080,0101,1,0,1,B,I,0|
T04,I,000,0130,150,0101,1,0,1,B,I,0|
T05,I,000,0390,150,0101,1,0,1,B,I,0|
T06,I,000,0130,260,0101,1,0,1,B,I,0|
T07,I,000,0265,260,0101,1,0,1,B,I,0|
T08,I,000,0480,260,0101,1,0,1,B,I,0|
T09,I,000,0130,340,0101,1,0,1,B,I,0|
T10,I,000,0390,340,0101,1,0,1,B,I,0|
L11,30,180,0,580,4|
L12,30,70,1,180,8|
L13,30,370,0,580,4|
L14,30,260,1,370,8|
}
{B01,0001,E,1,1,0,C;BATCH_01|
T01;12A|
T02;MISSES|
T03;456|
T04;Lt. Blue|
T05;10|
T06;12A|
T07;MISSES|
T08;456|
T09;Lt. Blue|
T10;10|
}
{T}

```

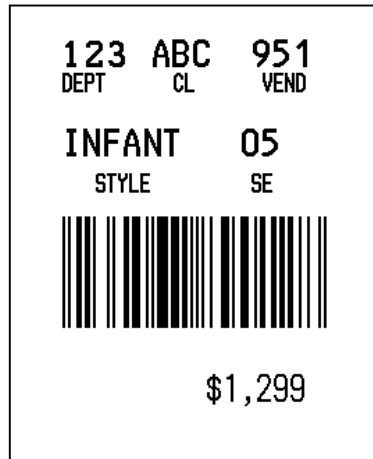


A-2 Text and Barcode data

```

{D5}
{N3}
{F02,0760,0560;FORMAT02|
T01,I,000,0380,110,0101,2,0,0,B,I,0|
T02,I,000,0380,250,0101,2,0,0,B,I,0|
T03,I,000,0480,080,0101,2,0,0,B,I,0|
T04,I,000,0480,200,0101,2,0,0,B,I,0|
T05,I,000,0480,280,0101,2,0,0,B,I,0|
T06,I,000,0510,080,0101,1,0,0,B,I,0|
T07,I,000,0510,180,0101,1,0,0,B,I,0|
T08,I,000,0510,280,0101,1,0,0,B,I,0|
T09,I,000,0410,080,0101,1,0,0,B,I,0|
T10,I,000,0410,245,0101,1,0,0,B,I,0|
B11,I,000,0170,080,1,7,0,0200,2|
T12,I,000,0060,180,0101,8,0,0,B,I,0|
}
{B02,0001,E,1,1,0,C;BATCH_02|
T01;STYLE|
T02;SE|
T03;DEPT|
T04;CL|
T05;VENO|
T06;123|
T07;ABC|
T08;951|
T09;INFANT|
T10;05|
B11;123456789012|
T12;\1,299|
}
{T}

```



A-3 EAN - 13 Barcode

```
{D5}  
{N3}  
{F03,0760,0560;FORMAT03|  
B01,I,000,0160,070,1,7,0,80,0|  
T02,I,000,0110,075,0101,1,0,0,B,D,0|  
T03,I,000,0110,190,0101,1,0,0,B,D,0|  
}  
{B03,0001,E,1,1,0,C;BATCH_03|  
B01;111111111111|  
T02;222|  
T03;333333|  
}  
{T}
```



A-4 Batch options

```

{D5}
{N3}
{F09,0760,0560;FORMAT09|
T01,I,0,350,50,0201,1,0,0,B,D,0|
T02,I,0,250,50,0101,1,0,0,B,D,0|
T03,I,0,150,50,0102,1,0,0,B,D,0|
}
{B09,0001,E,1,1,0,C;BATCH_09|
T01;Batch Print 1|
T02;NORMAL PRINT|
T03;Batch Print End|
}
{B09,0002,E,1,1,0,C;BATCH_09|
T01; Batch Print 2|
T02;PRINTING UNIT Q'ty|
T03; Batch Print End|
}
{B09,0001,E,1,1,2,C;BATCH_09|
T01; Batch Print 3|
T02; PRINTING UNIT Q'ty |
T03; Batch Print End|
}
{T}

```

```

Batch Print 1
NORMAL PRINT
Batch Print End

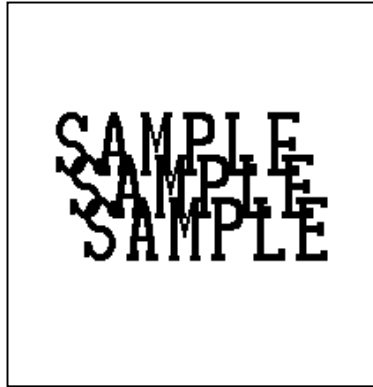
Batch Print 2
PRINTING UNIT Q'ty
Batch Print End

Batch Print 3
PRINTING UNIT Q'ty
Batch Print End

```


A-5 Overwrite option of Text data

```
{D5}  
{N3}  
{F11,0760,0560;FORMAT11;1|  
T1,I,0,170,100,0202,9,0,0,B,D,0|  
T2,I,0,250,060,0202,9,0,0,B,D,0|  
T3,I,0,330,030,0202,9,0,0,B,D,0|  
}  
{B11,0001,0,1,1,0,C;BATCH_11|  
T1;SAMPLE|  
T2;SAMPLE|  
T3;SAMPLE|  
}  
{T}
```



A-6 Graphic data

```

{D5}
{N3}
{G11,0,0,104,104|
;zzzz|
;zzzz|
;tteJtted|
;ttEEEEtted|
;jjjdFTFdjjj|
;zfMjMzfd|
;zcKuJzcd|
;zaHzdHzad|
;yGzjGyd|
;xFznGwd|
;vFzsFud|
;uEzuFud|
;sFzvEsd|
;rEzzbDsd|
;qEzzdEqd|
;pDzzhCqd|
;oEzziDod|
;nDzzlCod|
;mDzzmEmd|
;lDzzmHkd|
;kDzzmDbCkd|
;kDzzlDcDjd|
;iDzzmDeDid|
;iDzzlDfDid|
;hDzzlDiDhd|
;hDzzkDjChd|
;gCzzlDkDgd|
;gCzzkDmDfd|
;fDzzjDoCfd|
;fBzzkDpDed|
;dDzzjDsBed|
;dDzziDtCdd|
;cDzziDuCdd|
;cDzzhDwCc|
;cDzzgDxCcd|
;cDzzeDyDbd|
;cCzzeDzaDbd|
;bDsZSdBbBoCbd|
;bCtZSdBbBoCdd|
;bCtZSdBbBoDad|

```

;bCtZSdBbBoDad|
 ;bBuZSdBbBpCad|
 ;aCuZSdBbBpCad|
 ;aCuZSdBbBpCad|
 ;aBvZSdBbBpDd|
 ;aBvZSdBbBpDd|
 ;CvZSdBbBpDd|
 ;CzxDzmCd|
 ;CzwDznCd|
 ;CzvDzpCd|
 ;CzuDuAcAqCd|
 ;CztDuBcAqCd|
 ;CzsDvBbBqCd|
 ;CzrDwBbBqCd|
 ;CzqDxAcBqCd|
 ;CzpDwBeAqCd|
 ;CzoDjGeCfAqCd|
 ;DzmDfFfFhBoDd|
 ;aCzIDfAzBoDd|
 ;aCzkDfAzaApDd|
 ;aCzjDgByAqCad|
 ;aCziDiAnDdCrCad|
 ;aDzgDjAmBbEuCad|
 ;bCzfDkAmAzBdad|
 ;bCzeDmAlAzBdad|
 ;bCzdDjFlAzaCbd|
 ;bCzcDjAfAkAzaCbd|
 ;bDzaDjAtAyDbd|
 ;cCzDjAuAyDbd|
 ;cCyDjAwAwDcd|
 ;dBxDjBwAwDcd|
 ;dBwDkBwAwDcd|
 ;dDtDmAxAuDdd|
 ;eCsDnAxAuDdd|
 ;eDqDoBwAuCed|
 ;fCpDqAvAtEed|
 ;fDnDsAuAtCgd|
 ;gDlDtAtAsEgd|
 ;gDkDvAqCsEgd|
 ;iCiDwBoBuDhd|
 ;iChDyAiEvEhd|
 ;jDeDzbAfCzDid|
 ;jDdDzdAzfEjd|
 ;lCbDzfBzdDkd|
 ;lHziAzaEld|
 ;nEzkAzDmd|
 ;nDzmAwEmd|

```

;pCzzjDod|
;pDzzhDpd|
;rDzzdEqd|
;rEzzaErd|
;tEzyEsd|
;vDzuFud|
;wEzsDwd|
;xFznFxd|
;yGzjFzd|
;zaHzdHzd|
;zcIwJzcd|
;zeKoKzfd|
;jjjeJJJejjj|
;jjjhGJGhjjj|
;jjjdFFdjjjj|
;zzzz|
;zzzz|
}
{F16,0760,0560;FORMAT16|
T01,I,0,400,50,0201,1,0,0,B,D,0|
T02,I,0,340,50,0201,1,0,0,B,D,0|
G11,100,100|
}
{B16,0001,E,1,1,0,C;BATCH_16|
T01;THANK YOU|
T02; FOR NOT SMOKING!!!|
}
{T}

```



A-7 Vertical Line data

{D5}

{N3}

{F29,0760,0560;FORMAT29}

T01,I,000,340,85,0101,1,0,0,B,I,0|

T02,I,000,340,185,0101,1,0,0,B,I,0|

T03,I,000,340,285,0101,1,0,0,B,I,0|

T04,I,000,340,385,0101,1,0,0,B,I,0|

L11,200,010,0,300,2|

L12,200,020,0,300,2|

L13,200,030,0,300,2|

L14,200,040,0,300,2|

L15,175,050,0,325,2|

L16,200,060,0,300,2|

L17,200,070,0,300,2|

L18,200,080,0,300,2|

L19,200,090,0,300,2|

L20,175,100,0,325,3|

L21,200,110,0,300,2|

L22,200,120,0,300,2|

L23,200,130,0,300,2|

L24,200,140,0,300,2|

L25,175,150,0,325,2|

L26,200,160,0,300,2|

L27,200,170,0,300,2|

L28,200,180,0,300,2|

L29,200,190,0,300,2|

L30,175,200,0,325,3|

L31,200,210,0,300,2|

L32,200,220,0,300,2|

L33,200,230,0,300,2|

L34,200,240,0,300,2|

L35,175,250,0,325,2|

L36,200,260,0,300,2|

L37,200,270,0,300,2|

L38,200,280,0,300,2|

L39,200,290,0,300,2|

L40,175,300,0,325,3|

L41,200,310,0,300,2|

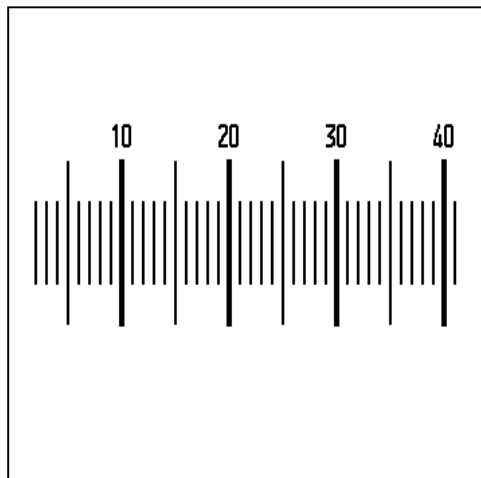
L42,200,320,0,300,2|

L43,200,330,0,300,2|

L44,200,340,0,300,2|

L45,175,350,0,325,2|

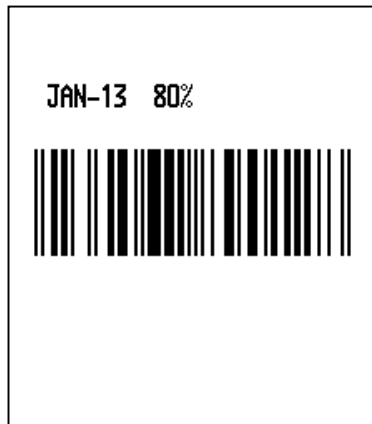
L46,200,360,0,300,2|



```
L47,200,370,0,300,2|
L48,200,380,0,300,2|
L49,200,390,0,300,2|
L50,175,400,0,325,3|
L51,200,410,0,300,2|
}
{B29,0001,E,1,1,0,C;BATCH_29|
T01;10|
T02;20|
T03;30|
T04;40|
}
{T}
```

A-8 Barcode option

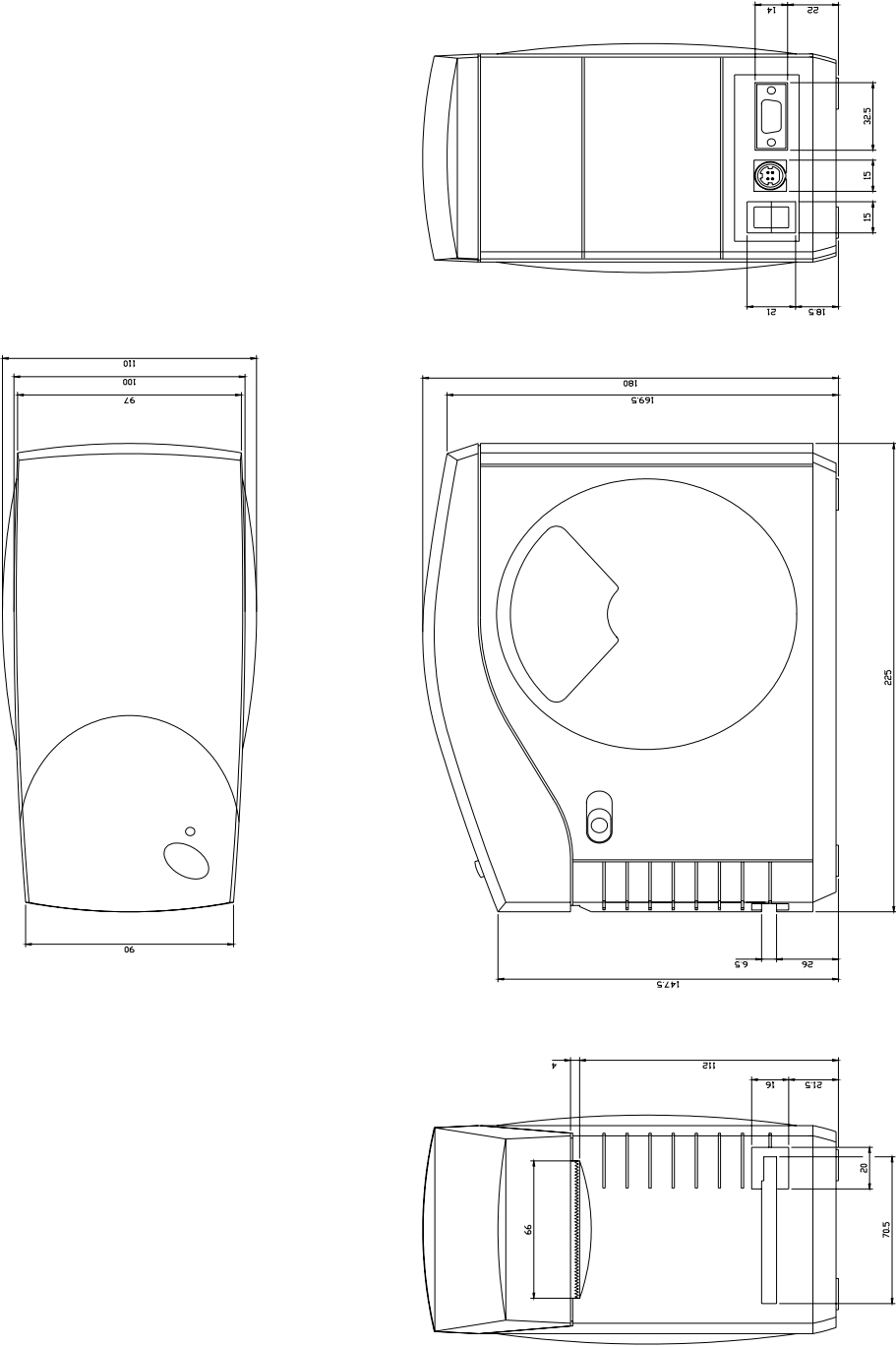
```
{D5}
{N3}
{F31,0760,0560;FORMAT31|
T01,I,0,230,070,0101,1,0,0,B,I,0|
B02,I,0,070,070,1,7,0,0100,0|
}
{B31,0001,0,1,1,0,C;BATCH_31|
T01;JAN-13 80%|
B02;123456198000|
}
{T}
```

**A-9 Barcode option**

```
{D5}
{N3}
{F32,0760,0560;FORMAT32|
T01,I,0,080,100,0101,1,0,1,B,I,0|
B02,I,0,070,260,3,7,1,0100,0|
}
{B32,0001,E,1,1,0,C;BATCH_32|
T01;JAN-13 120%|
B02;123456198000|
}
{T}
```



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