

**DYMO**<sup>®</sup>

# Technical Reference

## DYMO<sup>®</sup> LabelWriter<sup>®</sup> SE450 Label Printer



[www.dymo.com](http://www.dymo.com)

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## Description: Direct Thermal Printer

### Model: LabelWriter SE450

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC (Federal Communications Committee) rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correcting the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Use shielded cables to connect this device to computers.
- Consult the dealer or an experienced radio/TV technician for help.
- Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment and void the manufacturer's warranty.

## Certification

This device has been tested and complies with the requirements of:

UL 1950

EN60950: Low Voltage Directive Product Safety

FCC Part 15 Class B

EN55022: Radiated and Conducted Emissions B

EN50082-1: Generic Immunity ESD, RF, and Transient Susceptibility

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# Chapter 1

## Introduction

The LabelWriter SE450 printer is a compact, thermal-transfer label printer. Featuring both RS-232 serial and USB connections and including both an ASCII command set as well as raster printing modes, this printer can fit a wide variety of uses.

The LabelWriter SE450 printer can be readily connected to most common computer systems using the included Windows, Mac or Linux drivers. Or, for driver-less applications, the printer can be connected and driven entirely by ASCII Escape commands. This makes the LabelWriter SE450 an ideal printer to use in embedded applications, including medical devices, paint matching systems, and so on.

The LabelWriter SE450 printer can accept label material up to 62 mm (2.44") wide, and has a 57 mm (2.24") wide, 203 dot-per-inch (dpi) print head.

This Technical Reference provides all the information you need to be able to print labels with the LabelWriter SE450 printer.

In addition, Windows and Mac sample code is available on the CD that came with the LabelWriter SE450 printer.

In this Technical Reference, you will find:

- Information about how to configure the host computer to communicate with the LabelWriter SE450 over an RS-232 serial interface.
- Information about programming the LabelWriter SE450 printer
- A list of commands by function
- A complete alphabetical command reference
- A complete list of the standard and extended ASCII character codes supported by the printer
- Instructions for configuring the printer
- Printer specifications

As an additional resource, visit the Developer's Forum on the DYMO Web site.

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# Configuring the Host Computer for RS-232 Serial Interface

This chapter describes how to configure the host computer to communicate with the LabelWriter SE450 printer over an RS-232 serial interface.

- RS-232 Settings
- RS-232 Cabling
- RS-232 Signal Levels

For information about communicating with the host computer using the USB port, see the sample code located on the LabelWriter SE450 CD that came with the printer.

## RS-232 Settings

---

In order for the host computer to communicate with the LabelWriter SE450 printer, the communication parameters must be set as follows:

<b>Baud Rate</b>	9600
<b>Data Bits</b>	8
<b>Stop Bits</b>	1
<b>Parity</b>	None

These settings can often be set using a BIOS setup program or an Operating System Control Panel application. For embedded applications, you may need to build these settings into the embedded system's initialization code.

Most languages provide a command or function to initialize a serial port.

If programming under Windows using Microsoft C/C++, use the function:

```
bios_serialcom()
```

Other C compilers offer a similar function. Consult your compiler user guide for the appropriate function to use to configure a serial port.

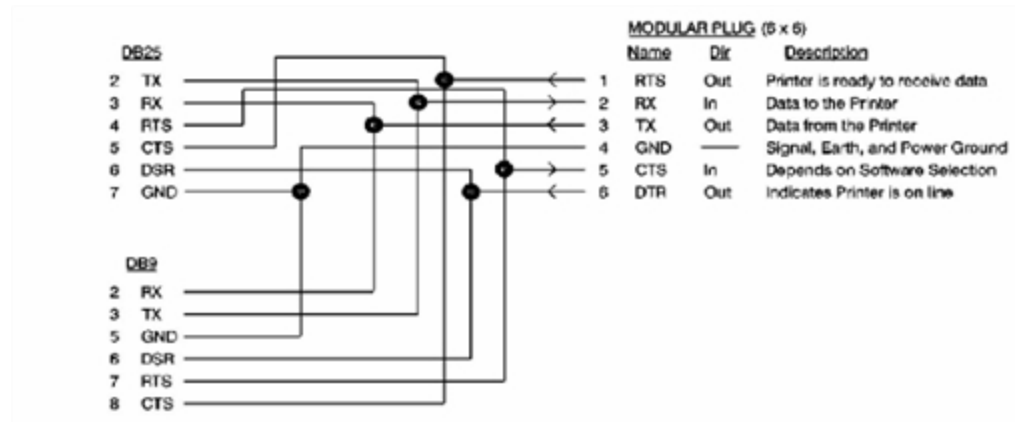
If you are using the Unix OS, you'll need to configure the RS-232 port as a dumb printer port, with no special handling, control characters or form feeds. The LabelWriter printer will handle these functions internally.

## RS-232 Cabling

RS-232 cable pinouts are shown in the table below. For details on RS-232 signal names, consult the RS-232 Standard documentation.

Origination (Mod. 8 x 8)	Termination (DB9S)	Name	Dir	Description
1	8	RTS	Out	Printer is ready to receive data
2	3	RX	In	Data to the printer
3	2	TX	Out	Data from the printer
4	5	GND	--	Signal, earth, and power ground
5	7	CTS	In	Depends on software selection
6	6	DTR	Out	Indicate printer is online

### Modular Plug



## RS-232 Signal Levels

The serial interface uses standard RS-232 signal levels as shown in the table below:

RS-232 signal levels.

Signal Level	Input	Output
MARK (1)	-27 V to -5 V	-5 V
SPACE (0)	+5 V to +27 V	+12 V

# Programming Overview

This chapter includes the information needed to control the LabelWriter SE450 printer correctly using ASCII Escape commands (referred to as ESC commands throughout this reference guide). Both basic and advanced topics are explained so that you understand how the LabelWriter SE450 printer works.

## Programming the LabelWriter Printer

The first step in controlling the LabelWriter SE450 printer is to understand how the printer works.

As an ASCII-based printer, the LabelWriter SE450 printer accepts 8-bit ASCII characters as both data and commands. The ASCII character table shows the relationship between the 8-bit values and the characters they represent.

The ASCII Table contains both "Printable" characters (with values 32 - 127 decimal) which are normally just printed, and non-printable, control commands that the printer interprets as action commands (form-feed for example).

As the printer reads character input from the controlling device, it interprets the data as characters to be printed, or commands, and acts accordingly. This means that sending data and commands to the printer is usually as simple as transmitting the characters from your program to the port to which the printer is connected.

A simple program to print 'Hello World' on the LabelWriter printer might look as follows if written in BASIC.

---

```
OPEN "COM1:9600,n,8,1" FOR OUTPUT AS #1
PRINT #1, "HELLO WORLD"
```

---

The "OPEN..." line above opens the selected COM port for printing and initializes the communication settings while the "PRINT..." line sends the data to the printer.

Commands can be sent to the printer in exactly the same way. For example, if you wanted to change the font which "Hello World" was printed into a 7-characters-per-inch font, you could look in this manual and find that the required command characters to do this are ESC and T. ESC refers to the Escape character. By checking the ASCII character table, you would find that the ESC character has a decimal value of 27. With this information, you can construct the following program to print 'Hello World' in a 7-characters-per-inch font.

---

```
OPEN "COM1:9600,n,8,1" FOR OUTPUT AS #1
PRINT #1, CHR$(27); "T";
```

---

---

```
PRINT #1, "HELLO WORLD"
```

---

In a nutshell, that's all there is to controlling the LabelWriter printer. Any formatting or special effect that you may need for your output can be specified simply and easily by sending the appropriate command characters and the data to be printed.

The next few sections cover the ins, outs, and general information that you should know before programming the LabelWriter printer.

## Resetting the Printer

Each print job should begin with a printer reset command. This ensures that the printer always begins in a known state. The command characters used to reset the LabelWriter printer are ESC (decimal value 27) followed by \* (decimal value 42).

## Command Parameters

When sending a command, all of the command characters and parameters that make up a command must be sent, without intervening characters. This is especially important when using the barcode and graphics commands. Sending fewer characters than specified for the command will either cause the command to fail or result in subsequent data being lost.

## Character Evaluation

Most of the parameters that are sent to the LabelWriter printer are evaluated based on their decimal value. It is very important to have a good understanding of what this means.

The ASCII character that is represented by a '3' does not have a decimal value of 3 (the character '3' has a decimal value of 51, as listed in the character code table).

Some people find it easy to think of the ASCII table as a table of 8-bit BYTE values, and these byte values represent the characters shown in the table. Since a SPACE character has a value of 32 decimal, a byte value of 32 decimal needs to be sent to represent a space in character output.

Some commands accept parameters by either their decimal value or the representative character. For example, the set print orientation command (GS V) interprets both a NULL (ASCII decimal value of 0) and the '0' character as meaning the same thing. This ensures backwards compatibility with the original LabelWriter SE printer and should not be assumed to be true for all commands in general.

## 16-Bit Character Parameters

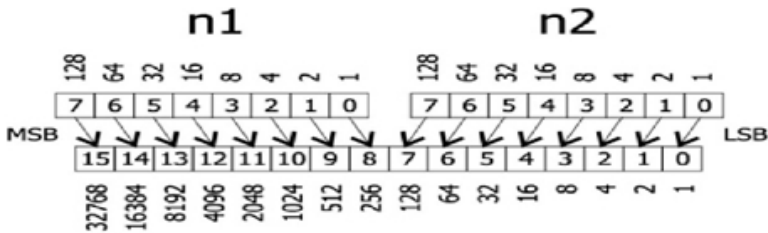
The maximum value a single 8-bit character can represent is 255. Some commands, though, can take values that are greater than 255.

The set horizontal starting position command (ESC X), for example, specifies a distance (in dots) that the next text object will print from the left margin. Because a dot is only 1/8th of a millimeter, a value of 255 would place the object only a little over 31 mm from the left margin.

To allow for longer distances to be specified, two 8-bit characters are used to specify the value, by combining them into one 16-bit character. Though the calculations are all performed within the printer itself, it is important to understand how the characters are handled.

The decimal value of the first character that is sent (usually noted as *n1*) is multiplied by 256. The decimal value of the second character sent (usually noted as *n2*) is then added to this.

The following illustration is a graphical representation of how this works.



To send a value under 256 to a command that takes the *n1 n2* parameters, simply send the first character with a 0 value. For values greater than 256 but less than 512, the first parameter should be sent with a value of 1. For values greater than 512 but less than 768, the first parameter should be set to 2, and so on.

**Conversions**

Converting from dots to inches using the *n1 n2* parameters can seem a bit challenging at first, but is really no more complex than multiplication and division. The table below lists some common values and their relationship.

Inches	Dots	n1	n2
0.5	101	0	101
1.0	203	0	203
1.5	304	1	48
2.0	406	1	150
2.5	507	1	251
3.0	609	2	97
3.5	710	2	198
4.0	812	3	44

To convert from a value shown in the Dots column, convert the Dots value to binary, and then convert the top eight bits to base 10 for *n1* and the bottom eight bits to decimal for *n2*.

For example:

710 base 10 = 0000001011000110  
n1 binary = 00000010 or "2" decimal  
n2 binary = 11000110 or "198" decimal

## Font Specifications

The table below lists the specifications for the five internal fonts the LabelWriter printer supports. Height and width are expressed in dots.

---

Font Setting Command	Height	Width	Horizontal cpi	Vertical cpi
ESC S	16	10	20.3	12.7
ESC P	24	12	16.9	8.4
ESC M	32	16	12.7	6.4
ESC U	32	20	10.2	6.4
ESC T	56	28	7.3	3.6

---

## Objects

---

Objects are the basic units printed by the LabelWriter printer. An object can be either a line of text, a barcode, a landscape graphic, a landscape line, or a raster dot line. Each of these objects has different rules relating to them. These rules are discussed later in this section.

Objects can also be either active or completed. An active object is one that is still receiving the data that composes it. A completed object is one that has been terminated. A line of text that has not yet received a line feed or carriage return is a good example of an active object. Until a terminator character, such as a line feed, is sent, more text characters can be added to the text object. Barcode and graphic objects do not require special terminator characters (such as line feeds). Instead they are considered complete as soon as they receive the correct amount of data.

## Print Modes

---

Before we move on to discuss the specific objects that the LabelWriter printer supports, it is important to cover the different print modes in which the LabelWriter may print the objects.

The LabelWriter printer includes three modes of printing: raster (bitmap graphics) mode, portrait printing mode, and landscape printing mode. Each mode operates under very different rules. These rules are detailed in the sections that follow.

The LabelWriter printer may be in only one print mode at a time. Multiple areas may be printed in different print modes on a single label, but these areas may not overlap.

In any mode, the set feed length command (GS L) is used to determine how far the LabelWriter printer will feed in search of a top-of-form hole. If the LabelWriter printer finds

a top-of-form hole before this maximum feed distance is reached, it will stop at that point, rather than continuing. This command is only needed when dealing with continuous-feed paper.

## Raster Mode

The LabelWriter SE450 command set includes most of the commands included in the command set for the LabelWriter 450 series printers, as well as the ASCII commands that are included in this Technical Reference. The two commands not available nor applicable to the LabelWriter SE450 printer are ESC G and ESC q (used to change rolls for the LabelWriter 450 Twin Turbo).

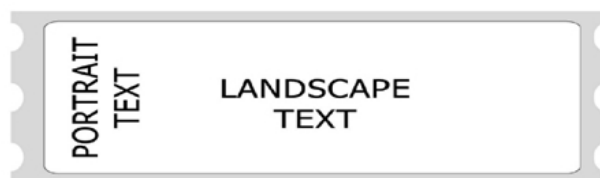
Raster mode refers to printing using the LabelWriter 450 printing commands, and is most often used when using printer drivers to print from Windows, Mac, or Linux computers. Because the LabelWriter 450 commands are an inherent part of the LabelWriter SE450, there are no special commands to switch to raster mode. Data may be sent exactly as though it were being sent to a LabelWriter 450 series printer and the LabelWriter SE450 will process and print the data correctly.

If you need to create your own printer driver for an embedded device or an unsupported operating system, refer to the *LabelWriter 450 Series Technical Reference* for full details.

In raster mode, each dot line is a complete object and is printed as soon as it is processed. Because of this, a raster dot line should not be sent while a label is being constructed using ASCII commands.

## Orientation

By default, the LabelWriter SE450 is set for portrait printing. The page orientation can be changed to landscape printing using the GS V command.



- Portrait Mode
- Landscape Mode

### Portrait Mode

In portrait mode, text characters travel out of the printer from the top of the character to the bottom. It is also possible to switch to this mode using the set print orientation command (GS V). The printer is set to portrait mode by default.

Portrait mode is also referred to as immediate mode printing, because each object that is sent to the printer while the printer is in portrait mode is printed as soon as the object is completed. No two objects may be printed on the same line in this mode because the paper is advanced as each object is completed and printed.

Certain commands are disabled or work differently while the printer is in portrait mode. Exact details can be found with each command's description.

## Landscape Mode

By using the set print orientation command (GS V), you can configure the LabelWriter printer for landscape printing. In landscape printing, text characters travel out of the printer from the left side of the character to the right. Before the printer can be switched to landscape printing though, you must send the set characters per line command (GS t). The set characters per line command defines the width of the landscape page.

A landscape page is defined as the area allocated by the LabelWriter printer in which landscape text, graphics, barcode, and line objects may be printed. The height of this landscape page always equals the width of the print head. The width of the landscape page is calculated when the set characters per line command (GS t) is sent. The width of the page is equal to the number of characters per line multiplied by the width of the current font. The default font is 16 dots wide (2 mm) and the default number of characters per line is 80.

In landscape mode, completed objects are placed within a memory buffer in the printer and are only printed when the landscape page is terminated. A form feed (FF) character is normally used to terminate a landscape page. This causes the printer to print the objects that have been placed on the landscape page and advance to the next label.

After a landscape page is printed, the LabelWriter printer will remain in landscape mode. If more objects are sent to the printer, a new landscape page will be allocated, with a width equal to the previous page. To change the width of a landscape page, you must send the set characters per line command (GS t) followed by the set print orientation command (GS V).

Because the LabelWriter printer does not print objects immediately, multiple objects can be placed on the same line. The set horizontal starting position (ESC X) and set vertical starting position (ESC Y) commands allow objects to be placed at any location within a landscape page. In the case of objects that are positioned to overlap each other, the first object that is sent to the printer will be printed in the overlapping area.

Objects that would normally print below the bottom of the landscape page can be either wrapped to the next label or truncated by using the select line wrap/truncate modes command (GS T).

Unless the set vertical starting position command (ESC Y) is used, the first object sent will be printed at the top of the landscape page. When printing to a label that is narrower than the print head, the top of the landscape page will be above the top of the label. In this case, you should use the set vertical starting position command (ESC Y) to position the object on an area of the landscape page that corresponds to the label.

---

## Text Objects

A text object is simply a line of printable characters. A text object is created whenever the LabelWriter printer receives a printable character that is not otherwise part of a command. Once it's created, a text object will remain active until it is terminated.

While a text object is active, any printable characters sent to the printer will be added to that text object. The only exceptions are printable characters that are sent as part of a



command. While a text object is active, commands that alter text line attributes (such as font and double-height character commands) are ignored. Commands that alter text character attributes (such as double wide and inverse) may be sent at any time.

Line attributes include the five basic fonts (ESC S, P, M, U, and T), plus the double-height font command (GS DC2). These commands may not be issued while a text object is active; instead they should be issued before a text object is begun. The font line attribute persists until another font command is received. The double-height line attribute persists either until the cancel double-height command (GS DC3) is sent or the current font is changed.

The character attribute commands include the set font to double wide (SO) and set inverse print mode (GS RS) commands. These commands may be issued or canceled at any time. Character attributes persist only until the end of a text object.

A text object can be terminated with a carriage return, a line feed, or both, in either combination. If the length of the text object exceeds the space allowed for printing, it will either wrap to the next line or truncate at the end of the printable area. The decision to wrap or truncate is determined by the select line wrap/truncate mode command (GS T). By default, text objects will wrap to the next line.

## Barcode Objects

---

A barcode object is created by the `print barcode (GS k)` command. Specified within the command is the symbology to be used, the amount of data to be encoded, and the data itself. Other attributes of the barcode, such as height and width, can be set using other commands.

The `set barcode height (GS h)` command specifies the height of the barcode in dots, or 1/8th mm. The maximum height for a barcode is 256 dots, or 32 mm. In cases where a taller barcode is needed, a second barcode can be printed below the first at the same left offset.

The `set barcode module width (GS w)` and `set barcode element width (GS W)` commands can be used to alter the width of the barcode. See the command descriptions for a full explanation of the differences between these two commands.

The POSTNET barcode symbology is an exception and does not respond to any of these commands. Instead, it always prints within the U.S. Postal Service's specifications.

The limitations of each symbology must be adhered to when sending data for a barcode. For example, you should not send alphabetic characters to symbologies that only accept numeric data (like the UPC/EAN symbology).

Other items must also be considered when printing barcodes. You must leave sufficient blank space on either side of the barcode to create a quiet zone. You must also select a good ratio/element size if the default values are not being used, and you must allow adequate room for the barcode to be printed on the label. If you ignore any of these items, the barcode that is printed may be unreadable.

In general, you should be very familiar with using barcodes if you want to ensure success.

A barcode object is self-terminating and will be processed as soon as it has received the last byte of data required to define to it. The `print barcode (GS k)` command's second

parameter specifies whether a fixed amount of data will be sent or whether delimiters will be used. In either case, the data sent must match the parameter setting. If a fixed number of characters are specified, then the exact number of characters specified must be sent. If delimiters are indicated, then matching characters must be sent before and after the barcode data to specify the beginning and end of the data. If an incorrect number of characters or delimiters are sent, the printer will not print correctly.

Barcodes that are too long to fit within the printable area of a label are truncated or do not print at all. This usually results in an unreadable barcode being printed. To correct this condition, you must set a narrower ratio, encode fewer digits, or use a more compact symbology.

## Graphic Objects

---

Graphic objects are created by the landscape mode graphics command (GS \*).

Graphic objects may only be printed as part of a landscape page. To print a graphic without entering landscape mode, you must use raster mode graphic commands.

No landscape graphic may be wider than 256 dots; however, a graphic may be as tall as the width of the LabelWriter printer's print head. If you need to print a graphic wider than 256 dots, you must either subdivide it into narrower sections or print it using raster mode graphics commands.

For more information about landscape graphic objects, see the descriptions of the graphics commands in this manual.

### See Also

GS \*

## Line Objects

---

Line objects are created using the draw line in landscape mode command (GS l).

Line objects may only be printed as part of a landscape page. If the length of a line object is set to exceed the printable area of a label, the line will be truncated at the end of the printable area.

### See Also

GS l

# Command Reference

This chapter describes the commands you can use to program your LabelWriter SE450 printer. Below are some of the things you can do with the commands:

- Send line feeds and carriage returns
- Define barcode size and position
- Read firmware revision and printer status information
- Define label size, and paper orientation
- Print graphics in inverse text mode and print enlarged characters

See the pages that follow for listings of commands arranged alphabetically and by function.

### Alphabetical Command List

---

NAME	DESCRIPTION
CR	Carriage Return
DC4	Cancel Double Wide Mode
ESC *	Reset to Defaults
ESC @	Reset to Power-up Condition
ESC A	Return Printer Status
ESC a	Return Hardware Status
ESC B	Set Dot Tab
ESC c	Set Print Temperature to Low
ESC D	Set Bytes per Line
ESC d	Set Print Temperature to Medium
ESC E	Form Feed
ESC e	Set Print Temperature to Default
ESC F 1 <i>n</i>	Feed <i>n</i> Lines

---

NAME	DESCRIPTION
ESC g	Set Print Temperature to High
ESC J <i>n</i>	Feed <i>n</i> Lines
ESC L	Set Feed Length
ESC M	Set Font to 12 cpi
ESC P	Set Font to 16 cpi
ESC Q	Set Top Margin
ESC S	Set Font to 20 cpi
ESC T	Set Font to 7 cpi
ESC U	Set Font to 10 cpi
ESC V	Return Firmware Revision
ESC W <i>n1 n2</i>	Wrap Data
ESC X <i>n1 n2</i>	Set Horizontal Starting Position
ESC Y <i>n1</i>	Set Vertical Starting Position
ESC y	Set 203 x 203 dpi
ESC z	Set 136 x 203 dpi
ETB	Raster Mode Compressed Graphics
FF	Form Feed
GS * <i>n1 n2 t h w dl...dm</i>	Landscape Mode Graphics
GS A <i>n1 n2</i>	Bar Code Start Position
GS d <i>n</i>	Feed <i>n</i> Text Lines
GS DC2	Set Font to Double Height
GS DC3	Cancel Double Height
GS h <i>n</i>	Set Bar Code Height
GS k <i>n m dl...dk</i>	Print Barcode

NAME	DESCRIPTION
GS L <i>n1 n2</i>	Set Feed Length
GS l <i>n1 n2 l1 l2 m</i>	Draw Line in Landscape Mode
GS q <i>n m d1...dk</i>	Print UPC/EAN Checksum
GS RS	Set Inverse Print Mode
GS S	Return Printer Status
GS T <i>n</i>	Select Line Wrap/Truncate Modes
GS t <i>n</i>	Set Characters per Line (Landscape)
GS u <i>n</i>	Set Characters per Line (Portrait)
GS US	Cancel Inverse Print Mode
GS V <i>n</i>	Set Print Orientation
GS W <i>Thin Thick</i>	Set Bar Code Element Width
GS w <i>n</i>	Set Bar Code Module Width
GS ~	Enter Debug Mode
HT	Horizontal Tab
LF	Line Feed
SO	Set Font to Double Wide Mode
SYN	Raster Mode Graphics

## Commands by Function

### Position Control

NAME	DESCRIPTION
HT	Horizontal Tab
LF	Line Feed
FF	Form Feed

NAME	DESCRIPTION
CR	Carriage Return
ESC J <i>n</i>	Feed <i>n</i> Sublines
ESC X <i>n1 n2</i>	Set Horizontal Starting Position
ESC Y <i>n1</i>	Set Vertical Starting Position
GS T <i>n</i>	Select Line Wrap/Truncate Modes
GS V <i>n</i>	Set Text and Bar Code Orientation
GS d <i>n</i>	Feed <i>n</i> Text Lines
GS t <i>n</i>	Set Characters per Line (Landscape)
GS u <i>n</i>	Set Characters per Line (Portrait)

## Font Control

NAME	DESCRIPTION
20h - FFh	Printable Characters (See <a href="#">Character Codes</a> for a table of printable characters.)
DC4	Cancel Double Wide Mode
ESC T	Set Font to 7 cpi
ESC M	Set Font to 12 cpi
ESC P	Set Font to 16 cpi
ESC S	Set Font to 20 cpi
ESC U	Set Font to 10 cpi
ESC X <i>n1 n2</i>	Set Horizontal Starting Position
GS DC2	Set Font to Double Height
GS DC3	Cancel Double Height
GS RS	Set Inverse Print Mode
GS US	Cancel Inverse Print Mode

NAME	DESCRIPTION
SO	Set Font to Double Wide Mode

## Barcodes

NAME	DESCRIPTION
GS A <i>n1 n2</i>	Barcode Start Position
GS W <i>Thin Thick</i>	Set Barcode Element Width
GS h <i>n</i>	Set Barcode Height
GS k <i>n m dl...dk</i>	Print Barcode
GS w <i>n</i>	Set Barcode Module Width

## Miscellaneous

NAME	DESCRIPTION
ESC @	Reset to Power-up Condition
ESC V	Return Firmware Revision
ESC W <i>n1 n2</i>	Wrap Data
GS ~	Enter Debug Mode
GS * <i>n1 n2 t h w dl...dm</i>	Landscape Mode Graphics
GS L <i>n1 n2</i>	Set Feed Length
GS S	Return Printer Status
GS l <i>n1 n2 l1 l2 m</i>	Draw Line in Landscape Mode

## Printable Characters

NAME	DESCRIPTION
20h - FFh	Printable Characters

## Raster Compatibility

---

NAME	DESCRIPTION
SYN	Raster Mode Graphics
ETB	Raster Mode Compressed Graphics
ESC *	Reset to Defaults
ESC @	Reset Printer to Power-up Condition
ESC A	Return Printer Status
ESC B	Set Dot Tab
ESC D	Set Bytes per Line
ESC E	Form Feed
ESC L	Set Feed Length
ESC Q	Set Top Margin
ESC a	Return Hardware Status
ESC c	Set Print Temperature to Low
ESC d	Set Print Temperature to Medium
ESC e	Set Print Temperature to High
ESC F 1 n	Feed "n" Sublines
ESC y	Set 203 x 203 dpi
ESC z	Set 138 x 203 dpi

---

## Commands

---

The commands are listed by name in alphabetical order. Each section contains a description of the command. The ASCII, hexadecimal, and decimal values for each command are also provided.

See Character Codes for a list of ASCII, hexadecimal, and binary codes.

### 20h - FFh Printable Characters

#### Description



These characters, while not part of an escape (command) sequence, will be printed using the currently selected font. The standard, printable ASCII characters are associated with their normal values, which range from decimal value 32 to decimal value 127. The extended ASCII character set is also included and ranges from decimal value 128 to decimal value 255.

See Character Codes for a summary of all the characters available.

### Parameters

None

## CR Carriage Return

### Description

Prints the current line of text and advances the text position to the beginning of the next line. Note that the line feed, line feed/carriage return, carriage return, and carriage return/line feed instructions all behave as a single line feed. If the current line extends beyond the printable area, the text will wrap to the next printable area.

All character attributes (including inverse and double-wide text) will be cleared after the line is printed.

### Expression

ASCII CR

Decimal 13

Hex 0D

### Parameters

None

## DC4 Cancel Double Wide Mode

### Description

Cancels double-wide text printing and returns the text to normal.

### See Also

SO

ESC W

### Expression

ASCII DC4

Decimal 20

Hex 14

### Parameters

None

## ESC A Return Printer Status

### Description

Provided for LabelWriter printer raster compatibility. ESC A is identical to the GS S command described in this guide. See the description of the GS S command for information on how to return the printer status.

### See Also

GS S

## ESC a Return Hardware Status

### Description

Provided for LabelWriter printer raster compatibility.

### See Also

GS S

## ESC B Set Dot Tab

### Description

Provided for LabelWriter printer raster compatibility. ESC B defines the left-hand starting position for the placement of raster mode bitmap data. ESC B is used in conjunction with the SYN (Raster Mode Graphics) and ETB (Raster Mode Compressed Graphics) commands.

The LabelWriter SE450 printer prints up to 56 bytes (448 dots) of bitmap data. ESC B allows the starting point (the left margin) to be relocated from the default position (byte 0), which is the extreme left side of the label, to any point, up to the right-hand margin (byte 56). The increments for relocating the starting point are in millimeters. Use of this command, along with the ESC D command, can drastically reduce the number of data bytes required to skip blank areas.

### See Also

ESC D

SYN

ETB

### Expression

ASCII ESC B *nl*

Decimal 27 66 *nl*

Hex 1B 42 *nl*

### Parameters

*nl* starting position from the left in millimeters: 0 to 55 (default = 0)

## ESC c Set Print Temperature to Low

Used to adjust the printing strobe.

This command is also supported by the LabelWriter SE300 and the LabelWriter 400 and 450 series printers.

### Expression

ASCII ESC c

Decimal 27 99

Hex 1B 63

### Parameters

None

## ESC D Set Bytes per Line

### Description

Provided for LabelWriter printer raster compatibility.

This command defines the number of bytes in a single line of raster bitmap data. The LabelWriter SE450 printer prints up to 56 bytes (448 dots) of bitmap data. Use of this command, along with the ESC B command, can drastically reduce the number of data bytes required to skip blank areas.

### See Also

ESC B

SYN

ETB

### Expression

ASCII ESC D *nl*

Decimal 27 68 *nl*

Hex 1B 44 *nl*

### Parameters

*nl* number of bytes per line (default = the allowed maximum, 56 bytes)

## ESC d Set Print Temperature to Medium

Used to adjust the printing strobe.

This command is also supported by the LabelWriter SE300 and the LabelWriter 400 and 450 series printers.

### Expression

ASCII	ESC d
Decimal	27 100
Hex	1B 64

**Parameters**

None

**ESC E Form Feed****Description**

Prints the contents of the text buffer and advances the print media. The distance the media will advance depends on two factors: the feed distance specified by the `GS L` command and the presence of a punch hole. The LabelWriter printer will advance until a punch hole is detected or until the feed distance (specified by the `GS L` command) has been reached.

When the printer is powered on, the feed distance stored in flash memory is used as the default distance; the factory default is 7.5 inches. A new feed distance specified by the `GS L` command will override the flash memory setting until the printer is either powered down or a reset command is issued (by the `ESC @` or `ESC *` command).

The FF and ESC E commands are the same and produce the same result.

**See Also**

FF

**Expression**

ASCII	ESC E
Decimal	27 69
Hex	1B 45

**Parameters**

None

**ESC e Set Print Temperature to Default**

Used to adjust the printing strobe.

This command is also supported by the LabelWriter SE300 and the LabelWriter 400 and 450 series printers.

**Expression**

ASCII	ESC e
Decimal	27 101
Hex	1B 65

**Parameters**

None

### ESC F 1 *n* Feed *n* Lines

#### Description

Provided for LabelWriter raster compatibility.

The command is used to feed the next "*n*" lines on the label. This command requires two bytes: the first byte is always 1, the second byte is the feed line value.

Note that this command functions identically to the ESC J command.

#### See Also

ESC J

### ESC g Set Print Temperature to High

Used to adjust the printing strobe.

This command is also supported by the LabelWriter SE300 and the LabelWriter 400 and 450 series printers.

#### Expression

ASCII ESC g

Decimal 27 103

Hex 1B 67

#### Parameters

None

### ESC h Set Print Speed to Fast

Used to set the printing speed to fast, which is the default speed.

This command is also supported by the LabelWriter 400 and 450 series of printers.

### ESC i Set Printing Speed to Barcode

Used to adjust the printing speed to slow for better print quality for barcodes and graphics.

This command is supported by the LabelWriter 400 and 450 series printers.

### ESC J Feed *n* Lines

#### Description

Feeds *n* number of sublines ( $n/203$  inch). This command causes the printer to print data stored in the buffer and then feed *n* number of dot lines. This command is similar to the GS d command.

#### See Also

GS d

#### Expression

ASCII ESC J *n*  
 Decimal 27 74 *n*  
 Hex 1B 4A *n*

**Parameters**

*n* = the desired number of sublines to feed

**ESC L Set Feed Length**

**Description**

Provided for LabelWriter raster compatibility.  
 See the GS L command for information.

**See Also**

GS L

**ESC M Set Font to 12 cpi**

**Description**

Changes to the 12 cpi normal font. The cell dimension is 32 H x 16 W. This is the default font.

Fonts may only be changed at the beginning of a line, prior to any printable characters. This font will remain in effect until the printer is reset (by the ESC @ or ESC \* command) or another font is selected.

**See Also**

ESC P  
 ESC S  
 ESC T  
 ESC U

**Expression**

ASCII ESC M  
 Decimal 27 77  
 Hex 1B 4D

**Parameters**

None

---

Font	Height	Width	Horizontal cpi	Vertical cpi
ESC S	16	10	20.3	12.7

---

Font	Height	Width	Horizontal dpi	Vertical dpi
ESC P	24	12	16.9	8.4
ESC M	32	16	12.7	6.4
ESC U	32	20	10.2	6.4
ESC T	56	28	7.3	3.6

## ESC P Set Font to 16 dpi

### Description

Changes to the 16 dpi mini font. The cell dimension is 24 H x 12 W.

Fonts may only be changed at the beginning of a line, prior to any printable characters.

This font will remain in effect until the printer is reset (by the ESC @ or ESC \* command) or another font is selected.

### See Also

ESC M

ESC S

ESC T

ESC U

### Expression

ASCII ESC P

Decimal 27 80

Hex 1B 50

### Parameters

None

Font	Height	Width	Horizontal dpi	Vertical dpi
ESC S	16	10	20.3	12.7
ESC P	24	12	16.9	8.4
ESC M	32	16	12.7	6.4
ESC U	32	20	10.2	6.4
ESC T	56	28	7.3	3.6

## ESC Q Set Top Margin

### Description

Provided for LabelWriter raster compatibility.

## ESC S Set Font to 20 cpi

### Description

Changes to the 20 cpi micro font. The cell dimension is 16 H x 10 W.

Fonts may only be changed at the beginning of a line, prior to any printable characters.

This font will remain in effect until the printer is reset (by the ESC @ or ESC \* command) or another font is selected.

### See Also

ESC M

ESC P

ESC T

ESC U

### Expression

ASCII ESC S

Decimal 27 83

Hex 1B 53

### Parameters

None

---

Font	Height	Width	Horizontal cpi	Vertical cpi
ESC S	16	10	20.3	12.7
ESC P	24	12	16.9	8.4
ESC M	32	16	12.7	6.4
ESC U	32	20	10.2	6.4
ESC T	56	28	7.3	3.6

---

## ESC T Set Font to 7 cpi

### Description

Changes to the 7 cpi headline font. The cell dimension is 56 H x 28 W.



Fonts may only be changed at the beginning of a line, prior to any printable characters. This font will remain in effect until the printer is reset (by the ESC @ or ESC \* command) or another font is selected.

### See Also

ESC M  
ESC P  
ESC S  
ESC U

### Expression

ASCII ESC T  
Decimal 27 84  
Hex 1B 54

### Parameters

None

### Example

Font	Height	Width	Horizontal cpi	Vertical cpi
ESC S	16	10	20.3	12.7
ESC P	24	12	16.9	8.4
ESC M	32	16	12.7	6.4
ESC U	32	20	10.2	6.4
ESC T	56	28	7.3	3.6

## ESC U Set Font to 10 cpi

### Description

Changes to the 10 cpi headline font. The cell dimension is 32 H x 20 W.

Fonts may only be changed at the beginning of a line, prior to any printable characters. This font will remain in effect until the printer is reset (by the ESC @ or ESC \* command) or another font is selected.

### See Also

ESC M  
ESC P  
ESC S  
ESC T

**Expression**

ASCII ESC U  
 Decimal 27 85  
 Hex 1B 55

**Parameters**

None

---

Font	Height	Width	Horizontal dpi	Vertical dpi
ESC S	16	10	20.3	12.7
ESC P	24	12	16.9	8.4
ESC M	32	16	12.7	6.4
ESC U	32	20	10.2	6.4
ESC T	56	28	7.3	3.6

---

**ESC V Return Firmware Revision**

**Description**

Returns ten ASCII characters (1765303v0G) that represents the firmware revision of the of the LabelWriter 450 series printers, with which the SE450 is 100% compatible.

**Expression**

ASCII ESC V  
 Decimal 27 86  
 Hex 1B 56

**Parameters**

None

**ESC W Wrap Data**

**Description**

Causes the characters *n1* and *n2* to be echoed back to the host. As soon as *n1* is received by the printer, the printer, in turn, will transmit *n1* back to the host. Your program should wait to receive *n1* before outputting *n2*. If you don't wait, you may

*n1*

*n2* are received successfully by the host, you can be reasonably assured that there is a LabelWriter printer attached connected and your program can communicate with the printer.

**Expression**

ASCII ESC W *n1 n2*

Decimal 27 87 *n1 n2*

Hex 1B 57 *n1 n2*

**Parameters**

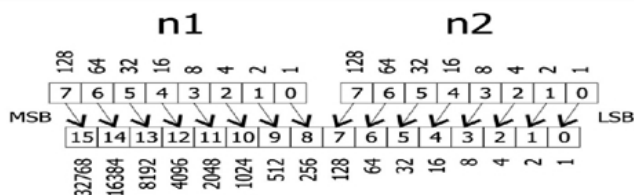
*n1* first character to echo

*n2* second character to echo

**ESC X Set Horizontal Starting Position**

**Description**

This command is used in landscape printing to set a new offset from the left margin from which to begin printing text and barcode objects. Distance is specified in dots (1 dot = 1/203 of an inch). The *n1* and *n2* parameters are evaluated to form a 16-bit word as follows: first, the *n1* parameter's decimal value is multiplied by 256, then the result is added to the decimal value of the *n2* parameter.



**Expression**

ASCII ESC X *n1 n2*

Decimal 27 88 *n1 n2*

Hex 1B 58 *n1 n2*

**Parameters**

*n1* high-order byte of 16-bit word that specifies distance

*n2* low-order byte of 16-bit word that specifies distance

**ESC Y Set Vertical Starting Position**

**Description**

This command is used in landscape printing to set a new offset from the top margin from which to begin printing text and barcode objects. Distance is specified in millimeters. The LabelWriter SE450 print head is 56 millimeters wide.

**Expression**

ASCII ESC Y *n*

Decimal 27 89 *n*

Hex 1B 59 *n*

**Parameters**

*n* the offset distance in millimeters

**ESC y Set 203 x 203 dpi****Description**

Provided for LabelWriter raster compatibility.

**ESC z Set 136 x 203 dpi****Description**

Provided for LabelWriter raster compatibility.

**ESC \* Reset to Defaults****Description**

Returns the printer to its power-up condition, clears all buffers, and resets all character attributes. The ESC \* command is the same as the ESC @ command.

**See Also**

ESC @

**Expression**

ASCII ESC \*

Decimal ESC 42

Hex ESC 2A

**Parameters**

None

**ESC @ Reset to Power-up Condition****Description**

Returns the printer to its power-up condition, clears all buffers, and resets all character attributes. The ESC @ command is the same as the ESC \* command.

**See Also**

ESC \*

**Expression**

ASCII ESC @

Decimal 27 64

Hex 1B 40

**Parameters**

None

**ETB Raster Mode Compressed Graphics****Description**

Provided for LabelWriter printer raster compatibility.

The ETB command is a synchronization character used to encode compressed raster bitmap print data. Print data is encoded in strings of 8-bit bytes preceded by a single ETB (Hex 17) character. The control electronics in the printer do not check the validity of the bitmap data.

Data compression is done through a form of run-length encoding. Bit seven (the sign bit) of a compressed character represents the value to be printed:

0 = white space, 1 = a printed pixel. Bits 6 through 0 represent the number of consecutive bits of the selected value plus 1.

Examples:

00 = 1 white pixel

80 = 1 printed pixel

0F = 16 white pixels

FF = 128 printed pixels

The data sent to the LabelWriter printer is handled on a line-by-line basis, so compressed lines may be intermixed with normal lines. In addition, the compressed mode also uses the set bytes per line command (ESC D) to determine how much data from the host to expect for each line. However, the sum of the pixels must be equal to the bytes per line variable (ESC D, default on the LabelWriter SE450 printer is 56) multiplied by 8. No error checking is done on the incoming data and unexpected results will occur if this caution is not observed.

Below is a sample compressed line for a ESC D 24 setting:

17 0F 8F 20 A0 20 A0 0F 8F

which would translate to:

16 white pixels

16 printed pixels

32 white pixels

32 printed pixels

32 white pixels

16 white pixels

16 printed pixels

Total 192 pixels = 24 bytes x 8

Using the ETB command, along with the ESC D and ESC B commands, can drastically reduce the number of data bytes required to form a print image. Refer to the description of the SYN command for more information on printing bitmap data.

### See Also

SYN

ESC B

ESC D

### Expression

ASCII    ETB *d1...dn*

Decimal    23 *d1...dn*

Hex        17 *d1...dn*

### Parameters

*d1...dn*    *n* bytes of bitmap print data as per ESC D setting.

## FF Form Feed

### Description

Prints the contents of the text buffer and advances the print media. The distance the media will advance depends on two factors: the feed distance specified by the GS L command and the presence of a punch hole. The LabelWriter printer will advance until a punch hole is detected or until the feed distance (specified by the GS L command) has been reached.

When the printer is powered on, the feed distance stored in flash memory is used as the default distance; the factory default is 7.5 inches. A new feed distance specified by the GS L command will override the flash memory setting until the printer is either powered down or a reset command is issued (by the ESC @ or ESC \* command).

The FF and ESC E commands are the same and produce the same result.

### See Also

ESC E

### Expression

ASCII    FF

Decimal    12

Hex        0C

### Parameters

None

## GS A Starting Position of Bar Code

### Description

Defines the distance from the left where the first barcode will print. The distance is represented in  $n/203$  inch (dot) increments. This command is used to center a barcode on a text line.

### Expression

ASCII GS A  $n1 n2$

Decimal 29 65  $n1 n2$

Hex 1D 41  $n1 n2$

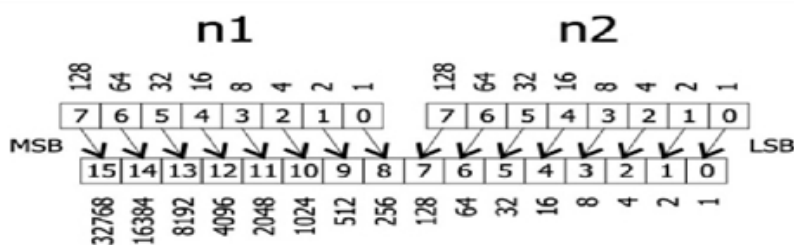
### Parameters

$n1$  the most significant byte

$n2$  the least significant byte

$$\text{Inches}/203 = (n1 * 256) + n2$$

Length	# of Dots	$n1$	$n2$
0.5	102	0	102
1.0	203	0	203
2.0	406	1	150
3.0	609	2	97



## GS DC2 Set Font to Double Height

### Description

Causes the current font to be printed at twice its normal height. The double-height setting will remain in effect until the current line attributes are cleared

### See Also

GS DC3

**Expression**

ASCII GS DC2

Decimal 29 18

Hex 1D 12

**Parameters**

None

**GS DC3 Cancel Double Height****Description**

Cancels the double-height characters and returns the font to normal size. This command must be sent at the beginning of a line, before any printable characters.

**See Also**

GS DC2

**Expression**

ASCII GS DC3

Decimal 29 19

Hex 1D 13

**Parameters**

None

**GS d Feed *n* Text Lines****Description**

Prints the contents of the buffer and feeds *n* number of text lines. This command has the same effect as line feeds.

**See Also**

ESC J

**Expression**ASCII GS d *n*Decimal 29 100 *n*Hex 1D 64 *n***Parameters**

*n* the desired distance (in text lines) to advance the print head



## GS h Set Barcode Height

### Description

Defines the height of the bars (in dots) for barcodes. The height is defined in  $n/203$  inch increments. For example, specify 203 as the value for  $n$  to print a 1-inch high barcode. The barcode height is always rounded up to the next multiple of 8.

### Expression

ASCII GS h  $n$   
 Decimal 29 104  $n$   
 Hex 1D 68  $n$

### Parameters

$n$  the desired height (in dot lines) of the barcode

## GS k Print Barcode

### Description

Prints a barcode at the current position in the current orientation. The  $n$  parameter selects the symbology to be printed. (See the table below.) The  $m$  parameter specifies how many characters are to be encoded as part of the barcode. If the number of characters to be encoded is variable, the  $m$  parameters can be set to zero. This will cause the printer to read the next character sent as a delimiter character. Further characters will then be encoded into the barcode until a character is found that matches the start character.

### Expression

ASCII GS k  $n m d1...dm$   
 Decimal 29 107  $n m d1...dm$   
 Hex 1D 6B  $n m d1...dm$

### Parameters

$n$  Selects the barcode symbology to be used  
 $m$  Specifies the number of characters to be encoded. Also specifies which EAN/UPC symbology will be used  
 $d1...dm$  The data characters to be encoded.

Character Value	Barcode Symbology
$n = 0$	POSTNET
$n = 1$	reserved


Character Value	Barcode Symbology
n = 2	EAN/UPC Auto
m = 6	UPC - E
m = 7	EAN-8
m = 8	invalid
m = 9	UPC-E + 2
m = 10	UPC Auto (UPC-E/UPC-A)
m = 11	UPC-A
m = 12	UPC-E + 5, EAN-13
m = 13	UPC-Auto + 2
m = 14	UPC-A + 2
m = 15	EAN-13 + 2
m = 16	UPC-Auto + 5
m = 17	UPC-A + 5
m = 18	EAN-13 + 5
n = 3	reserved
n = 4	Code 3 of 9
n = 5	MSI Plessey
n = 6	Codabar
n = 7	Interleaved 2 of 5
n = 8	Code 128-A
n = 9	Code 128-B
n = 10	Code 128-C
n = 11	Code 128-Auto
n = 12	Bookland EAN
n = 13	SISAC
n = 14	PDF417
n = 15	Data Matrix

### Data Matrix Barcode

GS k command has different parameters for Data Matrix 2D barcodes, as follows:

```

ASCII   GS k n t r c m l m 2 dl....dm
Decimal 29 107 n t r c m l m 2 dl....dm
Hex     1D 6B n t r c m l m 2 dl....dm
    
```

 For Data Matrix encoding, the LabelWriter SE450 printer supports only basic ASCII characters 0x00-0x7F.

Data Matrix barcodes are only supported for 203 x 203 dpi modes. They are not supported for 203 x 136 dpi modes.

### Parameters

n	15 (0x0F) option byte Bit 7: “Numbers-only” compression. Uses the ASCII number pairs compression in the Data Matrix specification. When this is enabled, only ASCII numbers may be sent to the printer. Any other data will be turned into the digit 0. 0: Compression disabled 1: Compression enabled Bit 6: Exclude rectangles. Excludes rectangular symbols for when the symbol size is being auto-selected. Only effective when <i>r</i> and <i>c</i> are both 0. 0: When symbol size is being auto-selected ( $r=c=0$ ), a rectangular or square symbol may be chosen. 1: When symbol size is being auto-selected ( $r=c=0$ ), only square symbols will be chosen. Bit 5-0: Element size The remaining 6 bits form a binary value for the size of the individual square elements in each Data Matrix symbol. This value is in units of the printers 203 dpi pixels. So, a value of 5 will result in each square element in the symbol being 5/203” wide and tall. If this value is set to 0, the printer will use its default value of 4.
t	the number of rows in the symbol. If both <i>r</i> and <i>c</i> are 0, the printer will use the smallest supported Data Matrix symbol to store the data. Otherwise, this should be the desired number of rows, chosen from a supported symbol in the tables below.
r	the number of columns in the symbol. If both <i>r</i> and <i>c</i> are 0, the printer will use the smallest supported Data Matrix symbol to store the data. Otherwise, this should be the desired number of columns, chosen from a supported symbol in the tables below.
c	the most significant byte of data length.
m1	the least significant byte of data length.
m2	

### Supported Square Data Matrix Symbol Sizes

Rows	Columns	Number of Encodable ASCII bytes	Encodable numeric bytes with "Numbers-only" compression
10	10	3	6
14	14	8	16
18	18	18	36
22	22	30	60
26	26	44	88
36	36	86	172
44	44	144	288
52	52	204	408
72	72	368	736
88	88	576	1152
104	104	816	1632

**Supported Rectangular Data Matrix Symbol Sizes**

Rows	Columns	Number of Encodable ASCII bytes	Encodable numeric bytes with "Numbers-only" compression
8	18	5	10
8	32	10	20
12	26	16	32
12	36	22	44
16	36	32	64
16	48	49	98

**Examples**

Encoding the numbers 12345, using numbers-only compression, and excluding rectangles. This should result in a 10x10 symbol.

GS 'k' 15 t r c m1 m2 dl...dm

GS 0x6B 0x0F 0xC0 0x00 0x00 0x00 0x05 0x3132333435

Prints the following image:



Here, 5 characters are also sent: ABCDE. However, since they are not all numbers, compression is not used. Rectangles are not excluded, so an 8x18 symbol should be auto-selected. The element size has been set to 5.

GS 'k' 15 t r c m1 m2 dl...dm

GS 0x6B 0x0F 0x05 0x00 0x00 0x00 0x05 0x4142434445

Prints the following image:



## PDF417 2D Barcode

PDF417 is a barcode symbology with the following basic characteristics:

- Encodable Character Set:
  - Text compaction mode permits all printable ASCII characters to be encoded, i.e. values 32-126 inclusive in accordance with ISO/IEC 646 (IRV), as well as selected control characters.
  - Byte compaction mode permits all 256 possible 8-bit byte values to be encoded. This includes all ASCII characters value 0 to 127 inclusive and provides for international character set support.
  - Numeric Compaction mode permits efficient encoding of numeric data strings.
  - Various function codewords for control purposes.

- Symbol character structure:

Each PDF417 symbol consist of a stack of vertically aligned rows with a minimum of 3 rows (maximum 90 rows). Each row shall include a minimum of a 1 symbol character (maximum 30 symbol characters), excluding start, stop and row indicator columns. The symbol shall include a quiet zone on all four sides. Each character is 17 modules wide: 4 bar and 4 space elements with the largest element 6 module wide. SE450 specifies each module is 2 dots line wide.

- Maximum possible number of data characters per symbol (at error correction level 0): 925 data codewords which can encode:
  - Text Compaction mode: 1850 characters (at 2 data characters per codeword).
  - Byte Compaction mode: 1108 characters (at 1.2 data characters per codeword).
  - Numeric Compaction mode: 2528 characters (at 2.93 data characters per codeword).

At the minimum recommended error correction level, there is a maximum of 863 data codewords which can encode:

- Text Compaction mode: 1726 characters (at 2 data characters per codeword).
- Byte Compaction mode: 1033 characters (at 1.2 data characters per codeword).

- Numeric Compaction mode: 2528 characters (at 2.93 data characters per codeword).
- Symbol size:
  - Number of rows: 3 to 90.
  - Number of Columns: 1 to 30
  - Maximum codewords capacity: 928 codewords.
  - Maximum data codewords capacity: 925 codewords.
  - Selectable error correction: 2 to 512 codewords per symbol.

But due to the limitation of SE450's 2" Print head, the maximum data user can send in portrait and landscape mode as following:


Portrait mode: Any giving Dymo label can hold the maximum PDF417 barcode symbol column and row specified as following:

Column: 10

Row: 90

That gives user: the maximum characters with error correction level 0 sent to SE450 are:

- Numeric Compaction mode: 1318
- Byte Compaction mode: 540
- Text Compaction mode: 900
- At error correction level 4:
  - Numeric Compaction mode: 1224
  - Byte Compaction mode: 836 Text Compaction mode: 501

 If the pdf417 barcode is too large to print in portrait mode, it will be printed in landscape mode, after printing the barcode, it will resume to portrait mode again.

Landscape mode

Maximum column is 30 and maximum raw is 74. In landscape mode, user can send the maximum data according to PDF417 specification which is described previously.

With current firmware setup, SE450 switches to landscape mode if user sends the data is too large for portrait mode to hold a complete PDF417 symbol image.

GS k command has different parameters in PDF417 2D barcode, it is defined as following:

ASCII GS k n c r e m1 m2 dl....dm

Decimal 29 107 n c r e m1 m2 dl....dm

Hex 1D 6B n c r e m1 m2 dl....dm

Parameters:

n = 14: specify it is PDF417 2D barcode.

c = user defined symbol column number (1 to 30 in landscape, 1 to 10 in portrait), if it is 0, which means the column will be calculated according to PDF417 specification by SE450 Firmware.

r = user defined symbol row number (3 to 74 in landscape, 3 to 90 in portrait); if it is 0 which means the raw will be calculated according to PDF417 specification by SE450 Firmware.

e = user defined error correction level (0 to 8), if it is 0 which means the error correction level will be set according to PDF417 specification. It will be assigned as per the following Table:

Error Correction Level	Error Correction Codewords	Number of Data Codewords
0	2	--
1	4	1-40
2	8	1-40
3	16	41-160
4	32	161
5	64	320
6	128	> 321
7	256	--
8	512	--

m1 = the most significant byte of data length.

m2= the least significant byte of data length.

Total data length = m1 \* 256 + m2

Example

GS 'k' 0x0E 0x0 0x0 0x0 0x0 0x23 "This is a PDF417 Test, test 1234567"

prints the following PDF417 image:



## GS I Draw Line in Landscape Mode

### Description

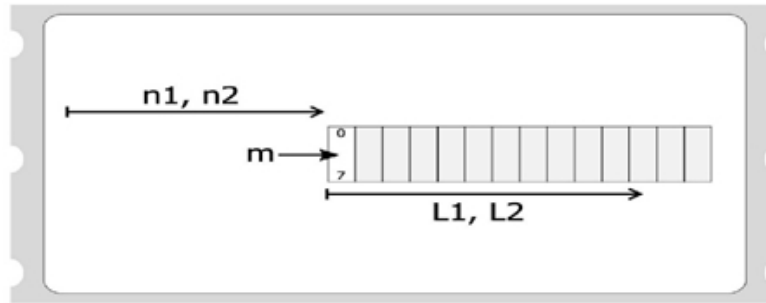
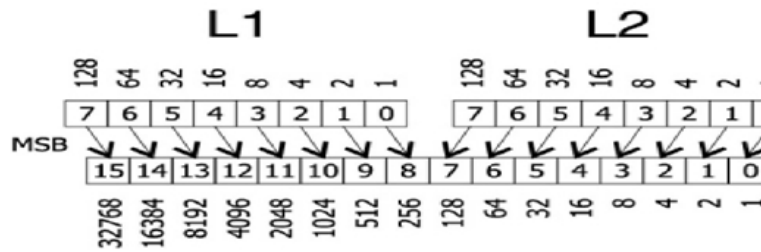
Draws a line in landscape mode. The thickness of the line is determined by the bit set by the bitmask, *m*.

### Expression

ASCII GS 1 *n1 n2 L1 L2 m*

Decimal 29 108 *n1 n2 L1 L2 m*

Hex 1D 6C *n1 n2 L1 L2 m*



### Parameters

*n1* most significant byte of the offset from the left (in dots)

*n2* least significant byte of the offset from the left (in dots)

*L1* most significant byte of the line length (in dots)

least significant byte of the line length (in dots)

where:

*L2*

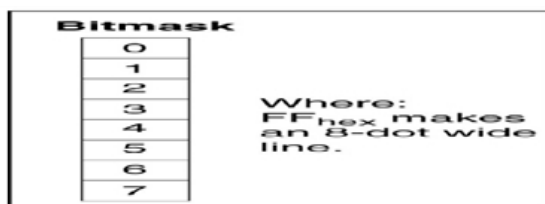
$$\text{offset} = \text{inches}/203 = (n1 * 256) + n2$$

$$\text{length} = \text{inches}/203 = (L1 * 256) + L2$$

*m* the bitmask (where 0 = top and 7 = bottom)

### Example





## GS L Set Feed Length

### Description

Sets the distance the print media will advance upon receipt of a form feed (FF or ESC E) command. The distance is defined as  $n/203$  inches. The number of dots =  $n1 * 256 + n2$ .

### Expression

ASCII GS L  $n1 n2$

Decimal 29 76  $n1 n2$

Hex 1D 4C  $n1 n2$

### Parameters

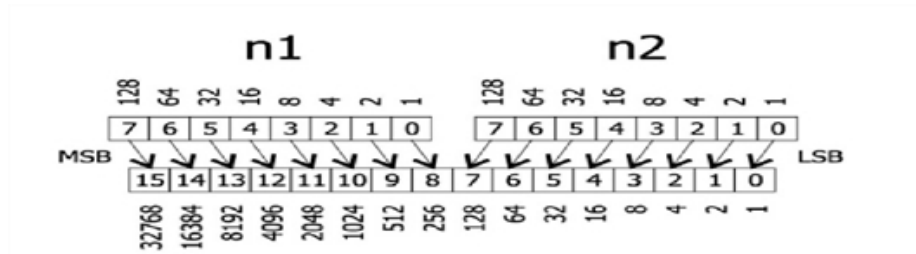
$n1$  the most significant byte

$n2$  the least significant byte

$$\text{Inches}/203 = (n1 * 256) + n2$$

Length (in inches)	# of Dots	n1	n2
0.5	102	0	102
1.0	203	0	203
2.0	406	1	150
3.0	609	2	97
4.0	812	3	44
5.0	1015	3	247
6.0	1218	4	194
7.0	1421	5	141
8.0	1624	6	88

### Example



## GS q Print UPC/EAN Checksum

### Description

Prints the checksum digit for the specified barcode. The checksum digit is printed in the current font, at the current text position. Currently the only supported symbologies are the UPC/EAN barcodes.

### Expression

ASCII *n m dl ...dm*

Decimal *n m dl ...dm*

Hex *n m dl ...dm*

### Parameters

*n1* selects the barcode symbology to be used

*m* specifies the number of characters to be encoded

*dl...dm* the data characters to be encoded

## GS RS Set Inverse Print Mode

### Description

Causes all the data that follows the command and appears on the current line to be printed as inverse characters (white on black). Inverse characters are canceled when character attributes are canceled.

### See Also

GS US

### Expression

ASCII GS RS

Decimal 29 30

Hex 1D 1E

### Parameters

None

## GS S Return Printer Status

### Description

Returns a single status byte. The printer status is determined by testing the individual bits within the returned status byte. Only bits that have defined values should be tested. Do not test bits designated as reserved.

When polling for the status byte, your program must wait for the status byte to arrive. The printer will take several milliseconds to process the request and then transmit the status byte. If your program does not wait for a received character, you may receive erroneous results.

ESC A and GS S are functionally identical. ESC A is provided for compatibility with the LabelWriter raster bitmap label printer. If possible, you should use GS S in order to ensure future compatibility.

### See Also

ESC A

### Expression

ASCII GS S

Decimal 29 83

Hex 1D 53

### Parameters

None

### Returns

Bit	Bit =0	Bit =1
0 LSB	Printer ready	Printer not ready
1	Not top of form	Top of form
2	RESERVED	RESERVED
3	RESERVED	RESERVED
4	RESERVED	RESERVED
5	Paper loaded	Out of paper
6	RESERVED	RESERVED
7 MSB	Printer has no error	Printer has error

## GS T Select Line Wrap/Truncate Modes

### Description

Determines how to handle a text wrap condition. A text wrap condition occurs when text extends beyond the end of a line or a page. The default is to wrap at the end of a line and a page.

### Expression

ASCII GS T *n*

Decimal 29 84 *n*

Hex 1D 54 *n*

### Parameters

- n* = 0 truncate in both directions
- n* = 1 wrap at end of line, but not end of page
- n* = 2 wrap at end of page, but not end of line
- n* = 3 wrap at end of line and end of page

## GS t Set Characters per Line in Landscape

### Description

Creates an internal memory buffer to store landscape text and barcodes until a form feed is received. The size of the buffer is determined by *n*, the number of characters per line. The *n* parameter is converted internally to millimeters so new line lengths can be automatically calculated in the event a font change takes place. The conversion to millimeters is done by multiplying the value of *n* by the width of whatever font is currently set when the GS t command is sent.

This command may be used in conjunction with the GS T command to determine where, if at all, text wraps to the next line.

This command is similar to the GS u command.

### See Also

GS u

GS T

### Expression

ASCII GS t *n*

Decimal 29 116 *n*

Hex 1D 74 *n*

### Parameters

- n* the desired number of characters per line in landscape mode

---

## GS US Cancel Inverse Print Mode

### Description

Cancels the inverse print mode (white on black) and returns text back to its normal attributes for the remainder of the current line.

### See Also

GS RS

### Expression

ASCII GS US

Decimal 29 31

Hex 1D 1F

### Parameters

None

## GS u Set Characters per Line in Portrait

### Description

Creates an internal memory buffer to store portrait text and barcodes. The size of the buffer is determined by  $n$ , the number of characters per line. The  $n$  parameter is converted internally to millimeters so new line lengths can be automatically calculated in the event a font change takes place. The conversion to millimeters is done by multiplying the value of  $n$  by the width of whatever font is currently set when the GS u command is sent.

This command may be used in conjunction with the GS T command to determine where, if at all, text wraps to the next line.

This command is similar to the GS t command.

### See Also

GS t

GS T

### Expression

ASCII GS u  $n$

Decimal 29 117  $n$

Hex 1D 75  $n$

### Parameters

$n$  the desired number of characters per line in portrait mode

## GS V Set Print Orientation

### Description

Causes the LabelWriter printer to print the data stored in the print buffer and then change to the selected orientation.

### See Also

GS t

### Expression

ASCII GS V *n*

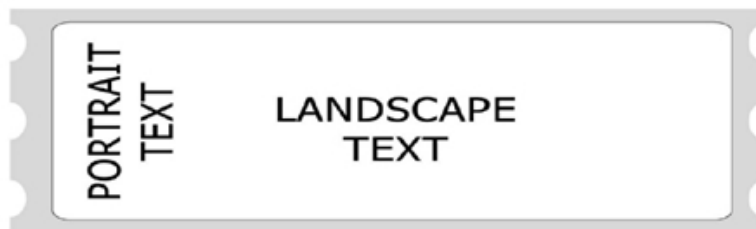
Decimal 29 86 *n*

Hex 1D 56 *n*

### Parameters

*n* Specifies the orientation and speed/resolution

<i>n</i> = 0	Portrait	203 x 203	High Speed
<i>n</i> = 1	Landscape	203 x 203	High Speed
<i>n</i> = 2	Landscape	203 x 138	High Speed
<i>n</i> = 4	Landscape	203 x 203	High Resolution
<i>n</i> = 6	Landscape	203 x 138	High Resolution



## GS W Set Bar Code Element Width

### Description

Selects the horizontal size of a barcode element. The *Thin* parameter represents the thickness of the thin bars (in dots). The *Thick* parameter represents the thickness of the thick bars (in dots). Each dot measures .0049 inches in 203 dpi and .0073 inches in 138 dpi.

In Code 3 of 9, Interleaved 2 of 5, and Codabar barcodes, the thick bar width is set according to the *Thick* parameter; however, all other symbologies ignore the *Thick* parameter. The *Thin* parameter is used by all symbologies.

### Expression

ASCII GS W *Thin Thick*  
 Decimal 29 87 *Thin Thick*  
 Hex 1D 57 *Thin Thick*

### Parameters

*Thin* thickness of thin bars  
*Thick* thickness of thick bars

## GS w Set Barcode Module Width

### Description

Selects the horizontal size of a barcode module. The parameter *n* represents the thickness of the thin bars (in dots). Each dot measures .0049 inches in 203 dpi and .0073 inches in 138 dpi. With Code 3 of 9, Interleaved 2 of 5, and Codabar barcodes, the thick bars will be automatically adjusted to  $2 * n$ .

### Expression

ASCII GS w *n*  
 Decimal 29 119 *n*  
 Hex 1D 77 *n*

### Parameters

*n* the desired horizontal size (in dots) of thin barcodes; with Code 3 of 9, Interleaved 2 of 5, and Codabar, thick barcodes =  $2 * n$

## GS ~ Enter Debug Mode

### Description

Prints the received printer codes either as a Hex or ASCII dump. This allows you to debug print problems. The debug mode remains in effect until the printer is powered off.

### Expression

ASCII GS ~ *n*  
 Decimal 29 126 *n*  
 Hex 1D 7E *n*

### Parameters

*n* = "a" ASCII dump of received characters  
*n* = "h" Hex dump of received characters

## GS \* Landscape Mode Graphics

### Description

Prints a graphic image (in landscape mode only).

### Expression

ASCII GS \* *n1 n2 t h w dl...dm*

Decimal 29 42 *n1 n2 t h w dl...dm*

Hex 1D 2A *n1 n2 t h w dl...dm*

### Parameters

*n1* most significant byte of left offset

*n2* least significant byte of left offset

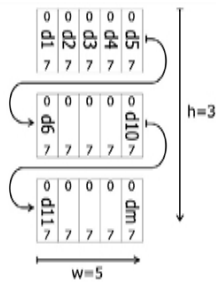
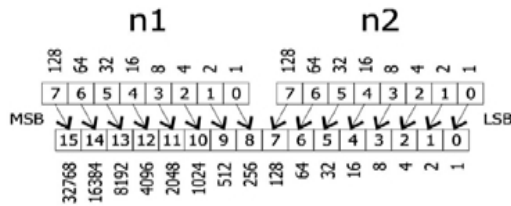
*t* offset from top (in millimeters)

*h* height of graphic (in millimeters)

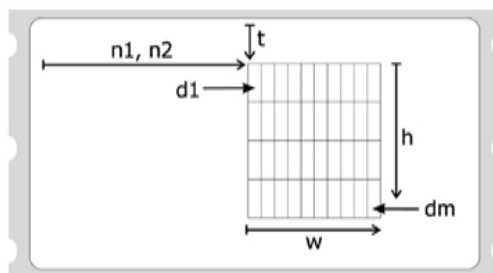
*w* width of graphic (in dots)

*dl* first data byte

*dm* last data byte (*h* \* *w*)







## HT Horizontal Tab

### Description

Moves cursor position to next multiple of eight single-width characters. Note that double-width characters count as two single-width characters. If the HT command causes the cursor to move beyond the printable area, the text will wrap to the next line.

### Expression

ASCII HT

Decimal 9

Hex 9

### Parameters

None

## LF Line Feed

### Description

Prints the current line of text and advances the text position to the beginning of the next line. Note that the line feed, line feed/carriage return, carriage return, and carriage return/line feed instructions all behave as a single line feed. If the current line extends beyond the printable area, the text will wrap to the next printable area.

All character attributes (including inverse and double-wide text) will be cleared after the line is printed.

### Expression

ASCII LF

Decimal 10

Hex 0A

### Parameters

None

## SO Set Font to Double Wide Mode

### Description

Causes all the text that follows the command on the same line to be printed as double-wide characters. Double-wide characters are canceled by a line feed (CR or LF) or the DC4 command.

Double wide is a character attribute and is available on a character-by-character basis. Double-wide text can be canceled at any point on the line. Double-wide text is automatically canceled at the end of the line. Therefore, subsequent lines will not be printed as double-wide text unless the SO command is re-issued at the beginning of each line.

### See Also

DC4

### Expression

ASCII SO

Decimal 14

Hex 0E

### Parameters

None

## SYN Raster Mode Graphics

### Description

Provided for LabelWriter raster compatibility.

SYN is a synchronization character used to encode bitmap print data. The number of bytes in each string is controlled by the ESC D command. The starting position (left margin) is controlled by the ESC B command. The control electronics in the printer do not check the validity of the bitmap data. Therefore, it is the responsibility of the host software to send the correct number of data bytes for the width of the print head in use by the printer.

The print head forms the image by heating a row of resistive elements that blacken the thermally sensitive label material. The resistive elements are 0.125 millimeters square (0.00492 inches) and are spaced at eight dots per millimeter (203.2 dots per inch) apart. The print head on the LabelWriter SE450 printer contains 448 elements. When a line is to be printed, the control electronics in the printer load the desired data into a serial shift register (the print head). The serial shift register has one location for each print element. A "1" in any given location causes the corresponding dot to be printed; a "0" leaves the dot un-printed. The most significant bit (bit 7) prints at the left margin.

There is no command for clearing the shift register, therefore, the entire register must be loaded for each print line in order to flush out the old data. To reset the LabelWriter printer after a synchronization error or to recover from an unknown state, the host computer should send at least fifty-seven (57) ESC characters, followed by an A, to request the printer to return the status byte. A minimum of 57 ESC characters are

required because this amount exceeds the longest possible string of bitmap data bytes that the LabelWriter printer expects.

### See Also

ESC B

ESC D

ETB

### Expression

ASCII    SYN *d1...dn*

Decimal 22 *d1...dn*

Hex      16 *d1...dn*

### Parameters

*d1*

...      bytes of bitmap print data (max 56 bytes for LabelWriter

*dn* =    SE450 print heads).

*n*

---

## The Caret Feature

Some computing environments do not allow the user to send the full range of ASCII characters, limiting output to printable characters only (20h - FFh). The Caret feature is used to resolve difficulties that may arise because of this.

### Activating the Caret Feature

The Caret feature defaults to off on the LabelWriter printer. To enable the Caret feature, set the printer to terminal mode and send a carriage return/line feed followed by the characters 'C' and '1'. The program below demonstrates this.

---

```
OPEN "COM1:9600,N,8,1" FOR OUTPUT AS #1
PRINT #1, CHR$(13); CHR$(10);
PRINT #1, "C1";
```

---

Refer to Configuration Menu for more information about Terminal mode.

### Using the Caret Feature

When the caret feature is enabled, the LabelWriter printer will translate any three-digit characters following a caret character (^) as the decimal value the digits expressed. For example, if the characters ^027 are sent to the printer, they are interpreted as a single character with a value of 27 (the Escape character).

When using the caret feature, three-digit characters must always follow the caret (^). Also, while the caret feature is enabled, the printer will not work correctly with the LabelWriter Windows or Mac raster print drivers.

# Character Codes

Below is a list showing the ASCII codes from 1 to 255. The list shows the ASCII characters and names, and the corresponding decimal, hexadecimal, and binary values.

<b>Char</b>	<b>Name</b>	<b>Decimal</b>	<b>Hex</b>	<b>Binary</b>
None	NUL	0	00	0000 0000
^A	SCH	1	01	0000 0001
^B	STX	2	02	0000 0010
^C	ETX	3	03	0000 0011
^D	EOT	4	04	0000 0100
^E	ENQ	5	05	0000 0101
^F	ACK	6	06	0000 0110
^G	BEL	7	07	0000 0111
^H	BS	8	08	0000 1000
^I	HT	9	09	0000 1001
^J	LF	10	0A	0000 1010
^K	VT	11	0B	0000 1011
^L	FF	12	0C	0000 1100
^M	CR	13	0D	0000 1101
^N	SO	14	0E	0000 1110
^O	SI	15	0F	0000 1111
^P	DLE	16	10	0001 0000
^Q	DC1	17	11	0001 0001
^R	DC2	18	12	0001 0010
^S	DC3	19	13	0001 0011
^T	DC4	20	14	0001 0100
^U	NAK	21	15	0001 0101
^V	SYN	22	16	0001 0110
^W	ETB	23	17	0001 0111
^X	CAN	24	18	0001 1000
^Y	EM	25	19	0001 1001
^Z	SUB	26	1A	0001 1010

Char	Name	Decimal	Hex	Binary
^[	ESC	27	1B	0001 1011
^\	FS	28	1C	0001 1100
^]	GS	29	1D	0001 1101
^^	RS	30	1E	0001 1000
^	US	31	1F	0001 1111
Space	space	32	20	0010 0000
!	exclamation pt.	33	21	0010 0001
"	quotation mark	34	22	0010 0010
#	number sign	35	23	0010 0011
\$	dollar sign	36	24	0010 0100
%	percent sign	37	25	0010 0101
&	ampersand	38	26	0010 0110
'	apostrophe	39	27	0010 0111
(	open parentheses	40	28	0010 1000
)	close parentheses	41	29	0010 1001
*	asterisk	42	2A	0010 1010
+	plus sign	43	2B	0010 1011
,	comma	44	2C	0010 1100
-	hyphen	45	2D	0010 1101
.	period	46	2E	0010 1110
/	slash	47	2F	0010 1111
0	zero	48	30	0011 0000
1	one	49	31	0011 0001
2	two	50	32	0011 0010
3	three	51	33	0011 0011
4	four	52	34	0011 0100
5	five	53	35	0011 0101
6	six	54	36	0011 0110
7	seven	55	37	0011 0111
8	eight	56	38	0011 1000
9	nine	57	39	0011 1001
:	colon	58	3A	0011 1010

---

<b>Char</b>	<b>Name</b>	<b>Decimal</b>	<b>Hex</b>	<b>Binary</b>
;	semicolon	59	3B	0011 1011
<	less than sign	60	3C	0011 1100
=	equal sign	61	3D	0011 1101
>	greater than sign	62	3E	0011 1110
?	question mark	63	3F	0011 1111
@	at sign	64	40	0100 0000
A	capital A	65	41	0100 0001
B	capital B	66	42	0100 0010
C	capital C	67	43	0100 0011
D	capital D	68	44	0100 0100
E	capital E	69	45	0100 0101
F	capital F	70	46	0100 0110
G	capital G	71	47	0100 0111
H	capital H	72	48	0100 1000
I	capital I	73	49	0100 1001
J	capital J	74	4A	0100 1010
K	capital K	75	4B	0100 1011
L	capital L	76	4C	0100 1100
M	capital M	77	4D	0100 1101
N	capital N	78	4E	0100 1110
O	capital O	79	4F	0100 1111
P	capital P	80	50	0101 0000
Q	capital Q	81	51	0101 0001
R	capital R	82	52	0101 0010
S	capital S	83	53	0101 0011
T	capital T	84	54	0101 0100
U	capital U	85	55	0101 0101
V	capital V	86	56	0101 0110
W	capital W	87	57	0101 0111
X	capital X	88	58	0101 1000
Y	capital Y	89	59	0101 1001
Z	capital Z	90	5A	0101 1010

<b>Char</b>	<b>Name</b>	<b>Decimal</b>	<b>Hex</b>	<b>Binary</b>
[	open bracket	91	5B	0101 1011
\	back slash	92	5C	0101 1100
]	close bracket	93	5D	0101 1101
^	caret	94	5E	0101 1110
_	underscore	95	5F	0101 1111
`	accent grave	96	60	0110 0000
a	lowercase a	97	61	0110 0001
b	lowercase b	98	62	0110 0010
c	lowercase c	99	63	0110 0011
d	lowercase d	100	64	0110 0110
e	lowercase e	101	65	0110 0101
f	lowercase f	102	66	0110 0110
g	lowercase g	103	67	0110 0111
h	lowercase h	104	68	0110 1000
i	lowercase i	105	69	0110 1001
j	lowercase j	106	6A	0110 1010
k	lowercase k	107	6B	0110 1011
l	lowercase l	108	6C	0110 1100
m	lowercase m	109	6D	0110 1101
n	lowercase n	110	6E	0110 1110
o	lowercase o	111	6F	0110 1111
p	lowercase p	112	70	0111 0000
q	lowercase q	113	71	0111 0001
r	lowercase r	114	72	0111 0010
s	lowercase s	115	73	0111 0011
t	lowercase t	116	74	0111 0100
u	lowercase u	117	75	0111 0101
v	lowercase v	118	76	0111 0110
w	lowercase w	119	77	0111 0111
x	lowercase x	120	78	0111 1000
y	lowercase y	121	79	0111 1001
z	lowercase z	122	7A	0111 1010



Char	Name	Decimal	Hex	Binary
{	open brace	123	7B	0111 1011
	vertical line	124	7C	0111 1100
}	close brace	125	7D	0111 1101
~	tilde	126	7E	0111 1110
Delete	DEL	127	7F	0111 1111
€	Euro	128	80	1000 0000
		129	81	1000 0001
,		130	82	1000 0010
<i>f</i>		131	83	1000 0011
”		132	84	1000 0100
...		133	85	1000 0101
†		134	86	1000 0110
‡		135	87	1000 0111
^		136	88	1000 1000
%		137	89	1000 1001
Š		138	8A	1000 1010
<		139	8B	1000 1011
Œ		140	8C	1000 1100
		141	8D	1000 1101
Ž		142	8E	1000 1110
		143	8F	1000 1111
		144	90	1001 0000
‘		145	91	1001 0001
’		146	92	1001 0010
“		147	93	1001 0011
”		148	94	1001 0100
•		149	95	1001 0101
–		150	96	1001 0110
—		151	97	1001 0111
~		152	98	1001 1000
™	Trademark	153	99	1001 1001
š		154	9A	1001 1010

Char	Name	Decimal	Hex	Binary
>		155	9B	1001 1011
œ		156	9C	1001 1100
		157	9D	1001 1101
ž		158	9E	1001 1110
ÿ		159	9F	1001 1111
		160	A0	1010 0000
i		161	A1	1010 0001
¢		162	A2	1010 0010
£		163	A3	1010 0011
¤		164	A4	1010 0100
¥		165	A5	1010 0101
¦		166	A6	110 0110
§		167	A7	1010 0111
¨		168	A8	1010 1000
©	Copyright	169	A9	1010 1001
ª		170	AA	1010 1010
«		171	AB	1010 1011
¬		172	AC	1010 1100
		173	AD	1010 1101
®	Registered	174	AE	1010 1110
¯		175	AF	1010 1111
°		176	B0	1011 0000
±		177	B1	1011 0001
²		178	B2	1011 0010
³		179	B3	1011 0011
´		180	B4	1011 0100
µ		181	B5	1011 0101
¶		182	B6	1011 0110
·		183	B7	1011 0111
¸		184	B8	1011 1000
¹		185	B9	1011 1001
º		186	BA	1011 1010

<b>Char</b>	<b>Name</b>	<b>Decimal</b>	<b>Hex</b>	<b>Binary</b>
»		187	BB	1011 1011
¼		188	BC	1011 1100
½		189	BD	1011 1101
¾		190	BE	1011 1110
ı		191	BF	1011 1111
À		192	C0	1100 0000
Á		193	C1	1100 0001
Â		194	C2	1100 0010
Ã		195	C3	1100 0011
Ä		196	C4	1100 0100
Å		197	C5	1100 0101
Æ		198	C6	1100 0110
Ç		199	C7	1100 0111
È		200	C8	1100 1000
É		201	C9	1100 1001
Ê		202	CA	1100 1010
Ë		203	CB	1100 1011
Ì		204	CC	1100 1100
Í		205	CD	1100 1101
Î		206	CE	1100 1110
Ï		207	CF	1100 1111
Ð		208	D0	1101 0000
Ñ		209	D1	1101 0001
Ò		210	D2	1101 0010
Ó		211	D3	1101 0011
Ô		212	D4	1101 0100
Õ		213	D5	1101 0101
Ö		214	D6	1101 0110
×		215	D7	1101 0111
Ø		216	D8	1101 1000
Ù		217	D9	1101 1001
Ú		218	DA	1101 1010

Char	Name	Decimal	Hex	Binary
Û		219	DB	1101 1011
Ü		220	DC	1101 1100
Ý		221	DD	1101 1101
Ɔ		222	DE	1101 1110
Ɔ		223	DF	1101 1111
à		224	E0	1110 0000
á		225	E1	1110 0001
â		226	E2	1110 0010
ã		227	E3	1110 0011
ä		228	E4	1110 0100
å		229	E5	1110 0101
æ		230	E6	1110 0110
ç		231	E7	1110 0111
è		232	E8	1110 1000
é		233	E9	1110 1001
ê		234	EA	1110 1010
ë		235	EB	1110 1011
ì		236	EC	1110 1100
í		237	ED	1110 1101
î		238	EE	1110 1110
ï		239	EF	1110 1111
ð		240	F0	1111 0000
ñ		241	F1	1111 0001
ò		242	F2	1111 0010
ó		243	F3	1111 0011
ô		244	F4	1111 0100
õ		245	F5	1111 0101
ö		246	F6	1111 0110
÷		247	F7	1111 0111
ø		248	F8	1111 1000
ù		249	F9	1111 1001
ú		250	FA	1111 1010

<b>Char</b>	<b>Name</b>	<b>Decimal</b>	<b>Hex</b>	<b>Binary</b>
û		251	FB	1111 1011
ü		252	FC	1111 1100
ý		253	FD	1111 1101
þ		254	FE	1111 1110
ÿ		255	FF	1111 1111

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# Configuration Menu

The LabelWriter SE450 printer has a Printer Configuration Menu built into the firmware. Through this menu, flash memory settings such as baud rate and feed distance can be changed. Flash memory settings remain in effect even after power has been removed from the printer.

The Printer Configuration Menu is accessible by using any terminal communications (modem) program (such as, Hyperterminal in Windows) and communicating with the printer through an RS-232 serial port. The communications software **MUST** be configured to operate as follows:

9600 baud, no parity, 8 data bits, and 1 stop bit

### To access the Printer Configuration menu

1. Load labels in the printer and connect the serial cable.
2. Disconnect power to the printer.
3. Press and hold down the form feed button.
4. While the form feed button is pressed, connect the power cord.
5. Continue to hold the form feed button down for five more seconds. The green light will blink.
6. Release the feed button.
7. Start your communications software.
8. Press <Enter> until the menu appears.

---

```
Dymo LabelWriter SE450
Firmware Version 1765303v0G
Printer Configuration Menu
Type ? for help
```

---

9. Press ? for help.  
You should see the following on your screen:

---

```
-?
B? Display Baud Rate
B0 Set 1200 Baud
B1 Set 2400 Baud
B2 Set 4800 Baud
B3 Set 9600 Baud
```

---

B4 Set 14,400 Baud  
B5 Set 19,200 Baud  
B6 Set 28,800 Baud  
B7 Set 38,400 Baud  
B8 Set 57,600 Baud  
B9 Set 115,200 Baud  
F? Display Default Feed Length  
Fnnnn Set default feed length  
X? Display XON/XOFF inhibit status  
X0 Send XON/XOFF  
X1 Inhibit XON/XOFF  
C? Display Caret (^) Status  
C0 Disable Caret Command  
C1 Enable Caret Command

-

---

10. When you are finished, unplug the printer.

The next time you connect power to the printer the changes you made will be in effect.



# Printer Specifications

This section covers hardware specifications for the LabelWriter SE450 printer.

- Hardware specifications
- Interface specifications
- Print head specifications

## Hardware Specifications

---

This section lists printer, interface, print head, and printing specifications. For additional serial interface specifications, refer to the next section in this chapter.

Model	LabelWriter SE450
Dimensions	Width: 4-7/8"
Height	5-3/4"
Depth	7-1/4"
Weight	1.5 pounds
Paper Handling	Straight. Entire path is accessible.
Maximum Duty Cycle	Continuous print at 10% print coverage.

## Interface Specifications

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### USB

Type	Full-speed USB 2.0; USB 1.1 compatible
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### Serial

Type	Bi-directional, serial RS-232 using transmit, receive, and ground
Protocol	RTS/CTS or XON/XOFF, 9600 baud, 8 data bits, no parity, 1 start bit, 1 stop bit
Speed	1200 to 115,200 Baud

## Print Head Specifications

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Model	Fixed 2.25" linear thermal head
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Average Life	2 million lineal inches (over 31 miles) Print head is replaceable
Printing Method	Direct thermal
Speed	40 labels per minute (115,200 Baud, Serial) 48 labels per minute (through DYMO Label V.8, USB driver) 48 labels per minute for ASCII over both serial and USB (4-line address label)
Label Width	Maximum width of 62 mm (2.44 inches)
Resolution	203 x 203 and 136 x 20 dots per inch
Fonts	Five fonts (7.5 cpi, 10 cpi, 12 cpi, 16.5 cpi, and 20 cpi) and four variations (Normal, Double Height, Double Width, and Double Height/Double Width) for a total of 20 possible font variations
Barcode Types	Bookland EAN Codabar Code 3 of 9 Code 128-A Code 128-B Code 128-C Code 128-Auto Data Matrix EAN-8 EAN-13 EAN-13 + 2 EAN-13 + 5 Interleaved 2 of 5 MSI Plessey PDF417 POSTNET SISAC UPC-A UPC-A + 2 UPC-A + 5 UPC AUTO (UPC-E/UPC-A) UPC AUTO + 2 UPC AUTO + 5 UPC-E UPC-E + 2 UPC-E + 5

## USB Settings

---

The LabelWriter SE450 printer communicates with the host computer using a full-speed USB 2.0 interface. This interface also operates with USB Version 1.1 or later. The printer implements the standard USB Printer Class Device interface for communications (see [www.usb.org/developers/devclass/](http://www.usb.org/developers/devclass/)).

While it is not the purpose of this section to define how to write a USB driver for a printer device, this section provides some product specific information that is required for any USB device.

Each USB device provides plug-and-play information when it is connected to a host computer. This information includes a manufacturer specific, or Vendor, ID (VID) and a product specific ID (PID). These identifiers, when combined with the class type provided during USB enumeration, are sufficient to identify the driver to load.

### USB Vendor ID

The USB Vendor ID (VID) assigned to DYMO by the USB Implementers Forum is 0x0922h (2338 Decimal).

### USB Product IDs

The LabelWriter SE450 printer has the following unique Product ID:

Printer Model	Product ID (Hex)
DYMO LabelWriter SE450	0x0400

## Serial Interface Specifications

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This section describes the specifications for the serial interface. See [Configuring the Host](#) for details about connecting the printer to your computer through the serial interface.

The RS-232 serial interface communicates using hardware and XON/XOFF flow control. Flow control helps to ensure that your computer doesn't send information to the printer faster than it can print.

The XON/XOFF protocol is a popular data communications protocol. When the printer's buffer is approximately 90 percent full, it sends the ASCII code XOFF (13 hex) to the computer to tell it to stop sending data. When there is again room (that is, space for approximately 10 percent more characters in the buffer), the printer sends the ASCII code XON (11 hex) to the computer to tell it to resume sending data. (XON is also known as DC1; XOFF is synonymous with DC3.) If the computer doesn't stop sending data after it receives an XOFF, the data that overflows the buffer will be lost, and the printed results will be different from what was expected and may include dropped characters.

The printer will send an XON code when it goes on-line to get things started. It will send an XOFF code to stop the computer from sending information if the input buffer is approximately 80 percent full.

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