

Z4Mplus™ and Z6Mplus™ User Guide



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Z4Mplus and Z6Mplus User Guide:

Customer order number 13163L

Manufacturer part number 13163LB

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Table of Contents

1 • Proprietary Statement	v
Product Improvements	v
FCC Compliance Statement	vi
Canadian DOC Compliance Statement	vi
Liability Disclaimer	vi
Limitation of Liability	vi
Copyrights	vii
DECLARATION OF CONFORMITY	ix
Printer Products	xi
Printer Software and Firmware License Agreement	xiv
2 • Preface	xxvii
Contacts	xxviii
Support	xxviii
About this Document	xxix
Document Conventions	xxx
Related Documents	xxxii



3 • Introduction 1

- Inspect the printer. 2
 - Report Damage. 2
 - Storage 2
- Z4Mplus and Z6Mplus Printer Overview 3
 - Front Panel 3
 - Printer Side View. 5

4 • Printer Setup 7

- Before You Begin 8
 - Media 8
 - Ribbon. 9
 - Types of Media 10
 - Print Mode 12
- Load Media and Ribbon 13
 - Load the Media 13
- Load the Ribbon. 14
- Calibration 15
 - Auto Calibration. 15
- Printhead Pressure Adjustment 16
 - Rewind Media Alignment. 18
- Configuration Label 19
 - Print a Configuration Label 19
- Troubleshoot Printing Problems 21
- Basic Configuration 22
 - Basic Configuration Process. 23
- Position the Label Sensor. 26
 - Reflective Sensor 26
 - Configure the Software or Printer Driver. 28

5 • Communication 29

- System Considerations. 30
 - Interfaces 30
 - Cable Requirements 32

6 • Printer Basics	33
Printer Overview	34
Front Panel	34
Load Roll Media	38
Tear-Off Mode	38
Cutter Mode	40
Peel-Off Mode	42
Liner Take-Up Mode	44
Rewind	46
Load Fanfold Media	52
Load the Ribbon	54
Remove the Ribbon	56
7 • Configuration	59
Configuration	60
Enter Setup Mode	60
Change Password-Protected Parameters	61
Leave the Setup Mode	62
Configuration and Calibration Sequence	63
8 • Routine Care and Adjustments	87
Cleaning Procedures	88
Clean the Exterior	89
Clean the Interior	89
Clean the Sensors	91
Clean the Rewind Option	92
Clean the Peel-Off Assembly	94
Clean the Cutter Module	95
9 • Troubleshooting	99
LCD Error Conditions and Warnings	100
Error Conditions	100
Warnings	103
Print Quality Problems	105
Calibration	107
Communication Problems	108



Printer Diagnostics 110

 Power-On Self Test 110

 Additional Printer Self Tests 110

 Cancel Self Test 111

 Pause Self Test 112

 Feed Self Test 113

 Communications Diagnostics Test 114

10 • Specifications 115

 General Specifications 116

 Printing Specifications 117

 Media Specifications 118

 Ribbon Specifications 120

 Options 121

 Zebra Programming Language (ZPL II) 122

 Bar codes 123

 AC Power Cord 124

 Power Line Cord Specifications 124

Appendix A • DB-9 Connectors 125

 Printer Interface Technical Information 126

 Serial Data Communications 126

 Cable Specifications 126

Appendix B • Parallel Data Port 133

 Parallel Data Port 134

 Parallel Interface 134

 Parallel Port Interconnections 134

Appendix C • • Memory Cards 137

 Memory Cards 138

 PCMCIA Card 138

Appendix D • • Extend Printhead Life 141

 Extend the Life of Your Printhead with Save-a-Printhead Cleaning Film 142

 Recommended for all Zebra printers 142

 Use Save-a-Printhead Cleaning Film 145

 How to Order Cleaning Film Kits 146

Preface

The Preface discusses the topics and illustrates standards that are used throughout this guide.

Contents

Contacts	xxvi
Support	xxvi
About this Document.....	xxvii
Document Conventions.....	xxviii
Related Documents.....	xxx

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Buckinghamshire HP13 6EQ, UK
Telephone: +44 (0)1494 472872
Facsimile: +44 (0)1494 450103

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Web address: www.zebra.com/SS/service_support.htm

US Phone Number: +1 847.913.2259

UK/International Phone Number: +44 (0) 1494 768289

About this Document

The User Guide contains these chapters:

Title	Content Description
<i>Introduction</i>	Provides a high level overview of the Z4Mplus and Z6Mplus printer.
<i>Printer Setup</i>	Provides instructions for loading media and ribbon.
<i>Communication</i>	Describes communications options and their connections.
<i>Printer Basics</i>	Discusses detailed functions of controls and lights.
<i>Configuration</i>	Discusses detailed configuration settings.
<i>Routine Care and Adjustments</i>	Discusses printer cleaning and minor adjustments.
<i>Troubleshooting</i>	Discusses errors and warnings, print quality, and printer diagnostics.
<i>Specifications</i>	Lists all printer specifications.
<i>DB-9 Connectors</i>	Serial data connectors.
<i>Parallel Data Port</i>	Parallel port connections.
<i>Memory Cards</i>	Memory card installations.
<i>Extend Printhead Life</i>	How to extend the life of the printhead.

Document Conventions

The following conventions are used throughout this document to convey certain information:

About this Chapter: This section lists and describes each main section of the chapter, including the initial page number of that section. These sections primarily serve as hyperlink components for the Adobe Acrobat .pdf version of this guide.

Alternate Color: (on-line only) Cross-references contain hot links to other sections in this guide. If you are viewing this guide on-line in .pdf format, you can click the cross-reference (royal blue text) to jump directly to its location.

Command Line Examples: All command line examples appear in Courier font. For example, you would type the following to get to the **Post-Install scripts in the bin directory:** `Ztools`

Files and Directories: All file names and directories appear in Courier New font. For example, the `Zebra<version number>.tar` file and the `/root` directory.

Caution, Important, Note, and Example: These topics are defined in the following example:



Caution • Advises you that failure to take or avoid a specific action could result in physical harm to you or the hardware.

Caution • Advises you that failure to take or avoid a specified action could result in loss of data or hardware damage.



Important • Provides information that is essential to the completion of a task.

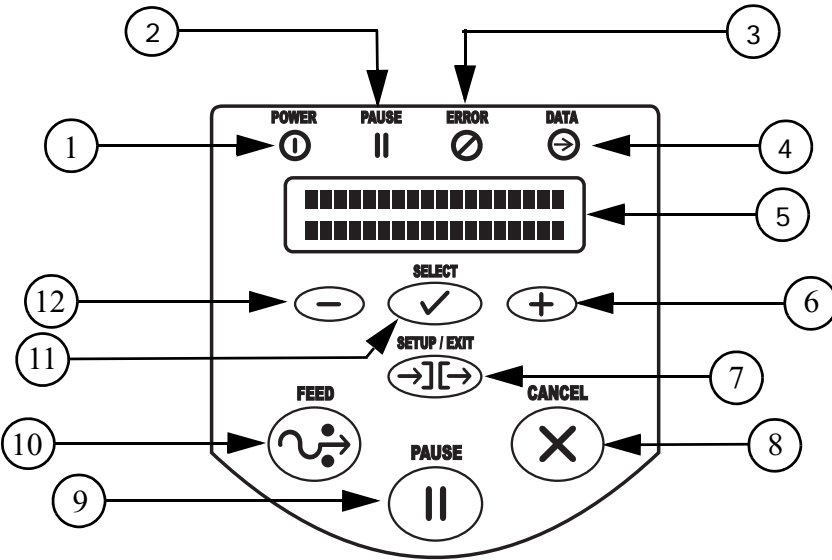


Note • Indicates neutral or positive information that emphasizes or supplements important points of the main text.



Example • Provides an example, often a scenario, to better clarify a section of text.

Illustration Call-out Instructions: Illustration call-out instructions are used when an illustration contains either information about a dialog box, step(s) to accomplish, or numbers in a table.



Related Documents

In addition to the *Z4Mplus and Z6Mplus User Guide*, the following documents might be helpful references:

- The *ZPL II Programming Guide Volume I and Volume II* (Zebra part number 45540L) details how to create the perfect label format for your application. The guide explains how the optional ZBI™ extends the power of ZPL II by allowing custom programs to be written that operate within the printer, directly interfacing with bar code scanners, keyboard display devices, etc. The guide also contains information about the enhanced operating system features of your printer. There are three ways to obtain this guide: on the accessory CD-ROM (supplied with the printer), on our web site (www.zebra.com), or by ordering printed manuals from your distributor.
- The *PrintServer II User and Reference Guide* (Zebra part number 45537L) explains how you can quickly set up your printer on an IP network and experience ZebraLink, our revolutionary real-time connectivity and control solution for Zebra printers (optional ZebraNet PrintServer II required).
- The *Z4Mplus and Z6Mplus Maintenance Manual* (Zebra part number 13358L) contains the information you need to maintain your printer.

CHAPTER 1

Introduction

This chapter provides a high level overview of the Z4Mplus and Z6Mplus Printer.

Contents

Inspect the printer	2
Report Damage	2
Storage	2
Z4Mplus and Z6Mplus Printer Overview	3
Front Panel	3
Printer Side View	5

Inspect the printer

- Check all exterior surfaces.
- Raise the media access door and inspect the media compartment.
- Save the carton and all packing material in case the printer needs to be shipped. Contact your authorized Zebra reseller for instructions.
- Depending on how your printer was ordered, a power cord may or may not be included. If one is not included, or if the one included is not suitable for your requirements, see [AC Power Cord on page 122](#).



Caution • For personnel and equipment safety, always use a three-prong plug with an earth-ground connection to the AC power source.

Report Damage

If you discover shipping damage:

- Immediately notify the shipping company and file a damage report.



Important • Zebra Technologies Corporation is not responsible for any damage incurred during the shipment of the equipment and will not repair this damage under warranty

- Keep the carton and all packing material for inspection.
- Notify your local Zebra reseller.

Storage

If you are not placing the printer into operation immediately, repackage it using the original packing materials. The printer may be stored under the following conditions:

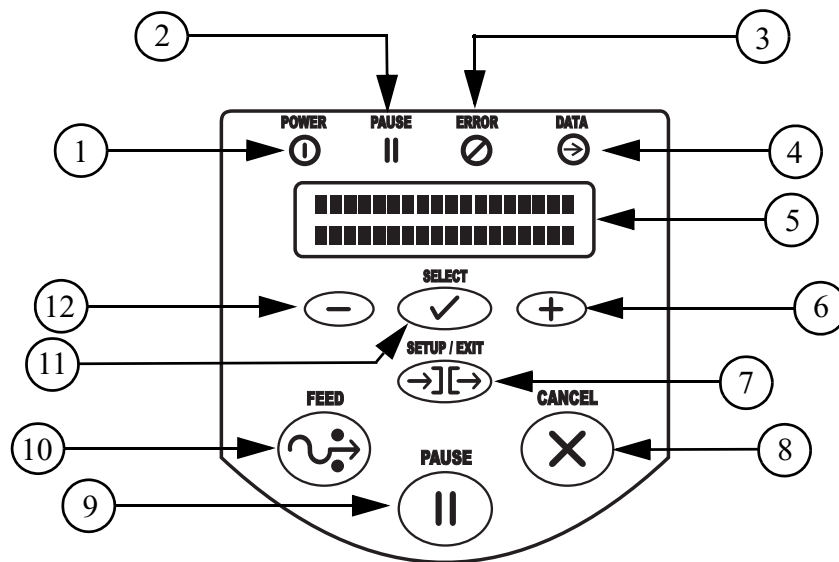
- Temperature: -40°F to 140°F (-40°C to 60°C)
- Relative humidity: 5% to 85%, non-condensing

Z4Mplus and Z6Mplus Printer Overview

The following information is a general overview of the Z4Mplus and Z6Mplus printers operational controls and location of major components needed in the loading of media and ribbon.

Front Panel

The front panel keys and lights are shown below.



Front Panel Controls and Lights

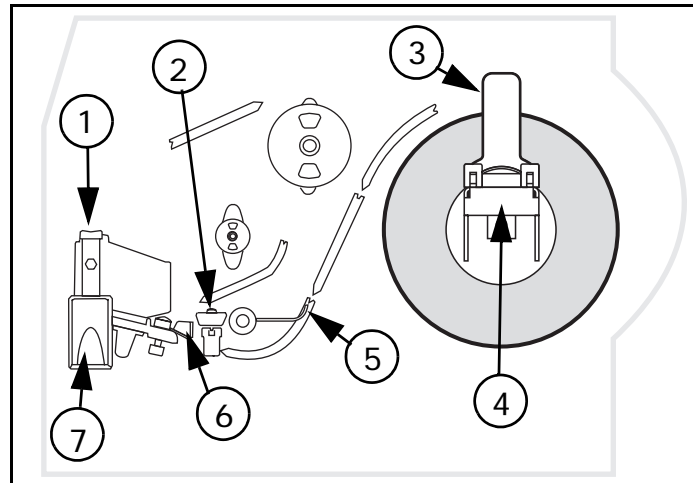
Introduction

Z4Mplus and Z6Mplus Printer Overview

Number	Description
1	Power LED
2	Pause LED
3	Error LED
4	Data LED
5	LCD
6	PLUS (+) Key
7	SETUP/EXIT Key
8	CANCEL Key
9	PAUSE Key
10	FEED Key
11	SELECT Key
12	MINUS (-) Key

Printer Side View

The illustration below is a simplified view of your printer. Depending on installed options, your printer may look slightly different.



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Label Supply Guide
4	Label Supply Hanger
5	Dancer
6	Label Guide
7	Printhead Open Lever



Introduction

Z4Mplus and Z6Mplus Printer Overview



CHAPTER 2

Printer Setup

This chapter provides instructions for loading labels and ribbon.

Contents

Before You Begin	8
Media	8
Ribbon	9
Types of Media	10
Print Mode	12
Load Media and Ribbon	13
Load the Media	13
Load the Ribbon	14
Calibration	15
Auto Calibration	15
Printhead Pressure Adjustment	16
Rewind Media Alignment	18
Configuration Label	19
Print a Configuration Label	19
Troubleshoot Printing Problems	21
Basic Configuration	22
Basic Configuration Process	23
Position the Label Sensor	26
Reflective Sensor	26
Configure the Software or Printer Driver	28

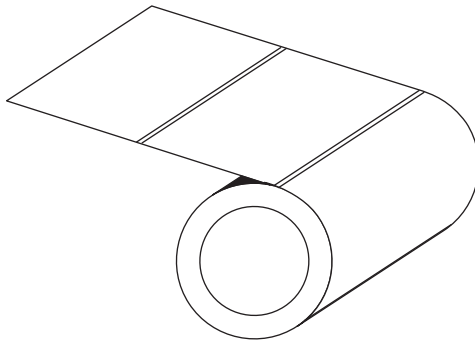
Before You Begin

Media

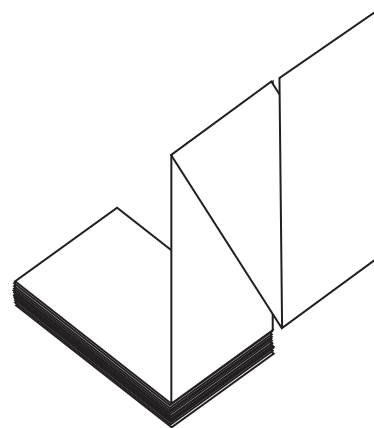
The Z4Mplus and Z6Mplus are capable of using various types of media. These include continuous roll and fanfold media as labels or card stock with optional perforations and registration holes.

Refer to [Printer Basics on page 33](#) for a detailed description of loading label media and ribbon.

Roll Media



Fanfold Media





Ribbon

Ribbon is a thin film carrying wax or wax resin that is transferred to the media during the thermal transfer process. Direct thermal media does not require the use of a ribbon, but printhead life may be shortened because of the abrasion of direct contact with the media.

Printhead life may be reduced by the abrasion from exposed paper fibers when using perforated media. Refer to [Printer Basics on page 33](#) for a detailed description of loading label media and ribbon.

Caution • The ribbon must be as wide or wider than the media being used. If the ribbon is narrower than the media, areas of the printhead are unprotected and subject to premature wear.



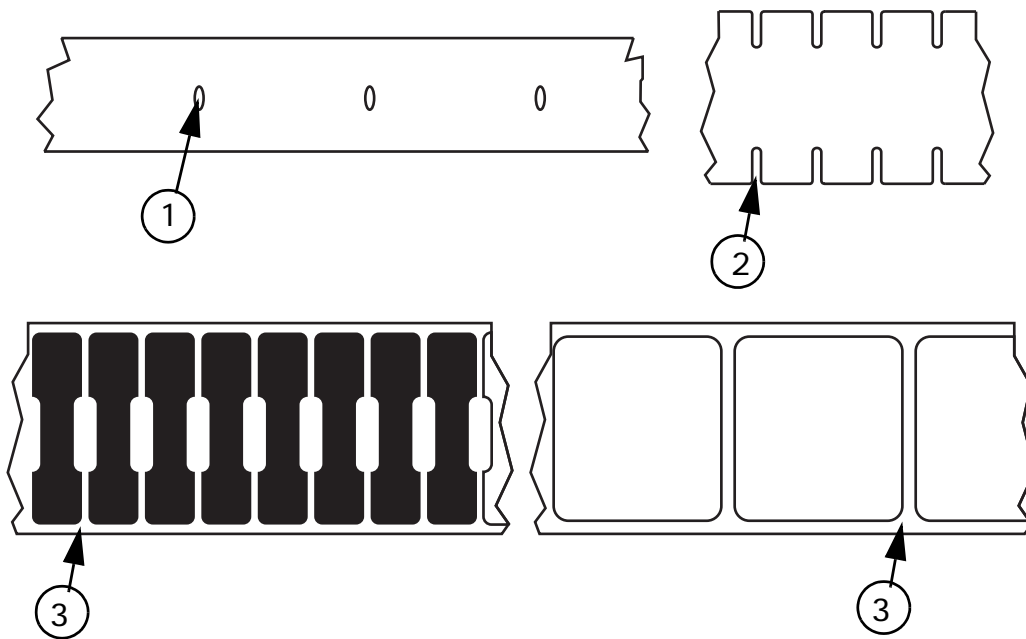
Note • When printing in direct thermal mode, ribbon is not used and should not be loaded into the printer.

Types of Media

The following is a description of the various types of media approved for use in the Z4Mplus and Z6Mplus printers.

Non-Continuous Web Media

Non-continuous web media (shown below) refers to individual labels separated by a gap, notch, or hole. When you look at the media, you can tell where one label ends and the next one begins. The illustration below shows samples of all three. The noncontinuous with gap, is individual labels on a continuous liner.

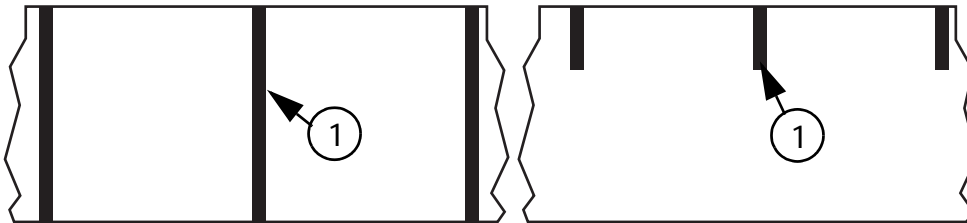


Number	Description
1	Hole
2	Notch
3	Label Gap



Non-Continuous Black Mark Labels

Non-continuous black mark labels have black marks printed on the back of the liner indicating the start and end of each label (shown below).



Number	Description
1	Black Mark

Continuous Media

Continuous media (shown below) is one uninterrupted roll of material without gaps, holes, notches, or black marks that allows the image to be printed anywhere on the label.



Print Mode

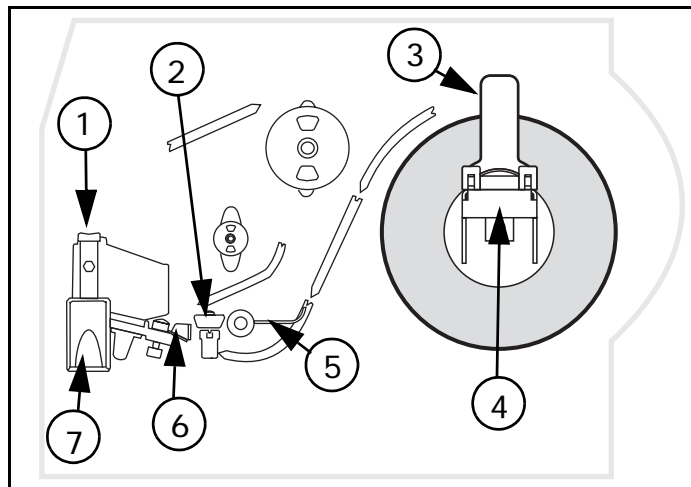
Print modes are displayed on the LCD on the front panel of the printer. Print modes should match the media and printer options chosen. Print mode choices are listed in the table below.

Mode	Printer Option	Action
Tear-Off Mode (Default setting)	Use for most applications.	Each label or strip of labels can be torn off after printing.
Peel-Off Mode	Use only if printer has the peel option.	Liner material is peeled away from the label as it is printed. After the printed label is removed the next label prints.
Cutter Mode	Use only if printer has a cutter option.	Printer automatically cuts the label after it is printed.
Rewind Mode	Use only if printer has the rewind option.	The media and/or liner are rewound onto a core as they are printed.

Load Media and Ribbon

Load the Media

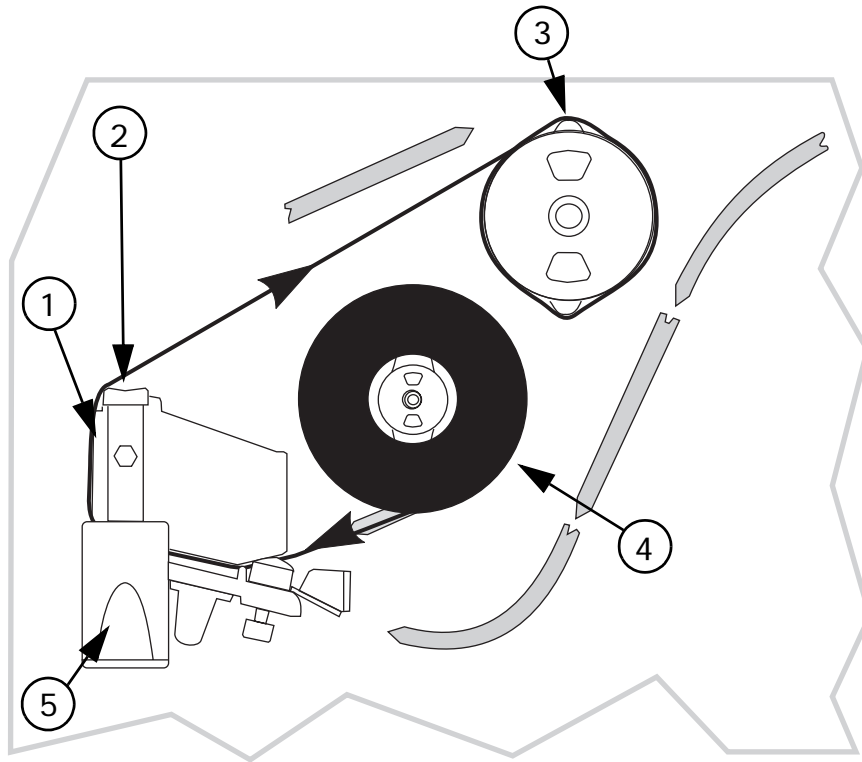
One method of media loading is shown in the illustration below. For more detailed instructions, as well as information about how to load the different types of media and the various printing modes, see [Printer Basics on page 33](#).



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Media Supply Guide
4	Media Supply Hanger
5	Dancer
6	Media Guide
7	Printhead Open Lever

Load the Ribbon

If the media is thermal transfer material, you must load a ribbon to print labels. See the illustration below. If the media is direct thermal material, do not load a ribbon.



Number	Description
1	Strip Plate
2	Printhead Assembly
3	Ribbon Take-Up Spindle
4	Ribbon Supply Spindle
5	Printhead Open Lever



Calibration

Auto Calibration

The Z4Mplus and Z6Mplus automatically calibrate on power up. During auto calibration, the printer determines the label length and sensor settings.

Auto calibration occurs when the printer is turned on and each time the printer recovers from an error condition. To clear an error, open and close the printhead assembly and then press **PAUSE**. The printer begins auto calibration when all errors have been cleared.

The results of the auto calibration are stored in the printer's memory and are retained even if printer power is removed. These parameters remain in effect until the next calibration is performed.

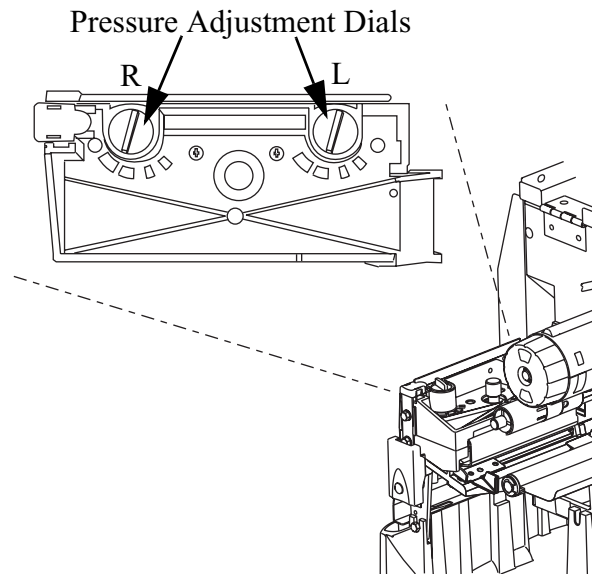


Note • If the front panel setting for MEDIA POWER UP or HEAD CLOSE are set to LENGTH, NO MOTION, or FEED, the printer starts printing without auto calibrating.

Printhead Pressure Adjustment

Refer to the illustration below.

This adjustment may be necessary if printing is too light on one side or if thick media is used.



The pressure adjustment dials for the Z4Mplus each have four possible settings designated by blocks of increasing size embossed on the print mechanism. The smallest block (fully counterclockwise) is considered position 1 and the largest block (fully clockwise) is considered position 4. The same is true for the Z6Mplus, except it has 7 positions.

Set Printhead Pressure

Use the tables below, depending upon which printer you have, to select the initial dial settings for your media.

Z4Mplus		
Media Width	Left Dial	Right Dial
1 in. (25.4 mm)	3	1
2 in. (51 mm)	4	1
3 in. (76 mm)	3	2
3.5 in. and up (89 mm and up)	3	3

Z6Mplus		
Media Width	Left Dial	Right Dial
2 in. (50 mm)	6	1
3 in. (75 mm)	6	2
4 in. (100 mm)	7	3
5 in. (125 mm)	7	4
5.5 in. and up (140 mm and up)	6	6

Some media types require higher pressure to print well. For these media, increase both dials one position. If the media tends to shift to the left while printing, increase the right dial setting one position or decrease the left dial setting one position. If the media tends to shift to the right while printing, increase the left dial setting one position or decrease the right dial setting one position.

Rewind Media Alignment

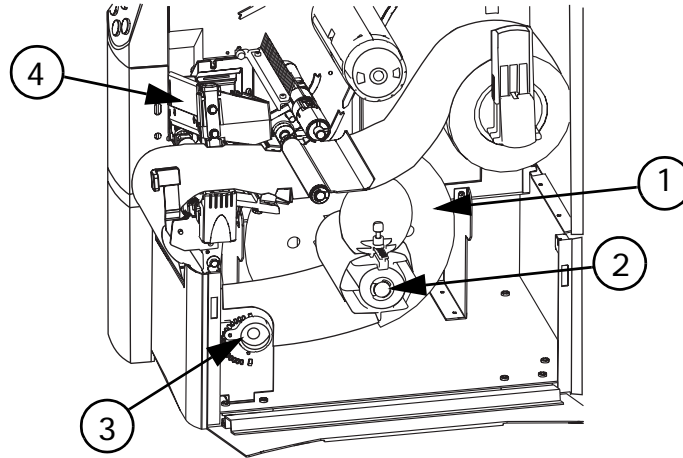
The instructions below apply if the printer has a rewind option. Refer to the illustration below.



Note • The liner should be installed flush against the backplate of the take-up spindle to prevent the media/backing from winding too loosely.

Do the adjustments in the order given. Do only what is needed to solve the problem.

1. Turn the adjustment dial clockwise to align the media toward the mainframe.
2. Turn the dial counter clockwise to align the media away from the mainframe.



Number	Description
1	Rewind Spindle Backplate
2	Rewind Spindle
3	Adjustment Dial
4	Printhead Assembly

Configuration Label

Print a configuration label to test the printer setup. Do this when the printer is first installed, or when the printer cannot properly detect the top of the label.

Print a Configuration Label

1. Turn the printer Off (O).
2. Press and hold **CANCEL** while turning the printer On (I). See the Front Panel illustration on [page 3](#).
3. Release **CANCEL** after the DATA light turns off (approximately five seconds).

A configuration label prints showing the printer's currently stored parameters (similar to the labels shown on the next page).

- If you encounter any problems while you are configuring the printer or printing a test label, see [Troubleshoot Printing Problems on page 21](#). If the test label printed correctly, go to [Communication on page 29](#).

Printer Setup
Configuration Label

PRINTER CONFIGURATION	
Zebra Technologies ZTC Z6Mplus - 300dpi	
+14.....	DARKNESS
2 IPS.....	PRINT SPEED
+000.....	TEAR OFF
TEAR OFF.....	PRINT MODE
NON-CONTINUOUS.....	MEDIA TYPE
WEB.....	SENSOR TYPE
AUTO SELECT.....	SENSOR SELECT
THERMAL-TRANS.....	PRINT METHOD
168 00/12 MM.....	PRINT WIDTH
1222.....	LABEL LENGTH
39.0IN 989MM.....	MAXIMUM LENGTH
BIDIRECTIONAL.....	PARALLEL COMM.
RS232.....	SERIAL COMM.
9600.....	BAUD
8 BITS.....	DATA BITS
NONE.....	PARITY
XON/XOFF.....	HOST HANDSHAKE
NONE.....	PROTOCOL
000.....	NETWORK ID
NORMAL MODE.....	COMMUNICATIONS
<~> 7EH.....	CONTROL PREFIX
<^> 5EH.....	FORMAT PREFIX
<,> 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
CALIBRATION.....	MEDIA POWER UP
CALIBRATION.....	HEAD CLOSE
DEFAULT.....	BACKFEED
-040.....	LABEL TOP
+0000.....	LEFT POSITION
016.....	WEB S.
064.....	MEDIA S.
071.....	RIBBON S.
061.....	TAKE LABEL
017.....	MEDIA LED
132.....	RIBBON LED
+10.....	LCD ADJUST
DPSWFXM.....	MODES ENABLED
.....	MODES DISABLED
1984 12/MM FULL.....	RESOLUTION
V44.12.4 <-.....	FIRMWARE
V22.0.0.54.....	HARDWARE ID
CUSTOMIZED.....	CONFIGURATION
3584k.....R:	RAM
2560k.....E:	ONBOARD FLASH
NONE.....	FORMAT CONVERT
000 DISPLAY.....	P30 INTERFACE
VALUE PEEL REWIND.....	OPTION
Q2/13/01.....	IDLE DISPLAY
08:25.....	RTC DATE
NONE.....	RTC TIME
AV31890.03JDR050114.33008.01.VH1	ZEBRA NET II

FIRMWARE IN THIS PRINTER IS COPYRIGHTED

PRINTER CONFIGURATION	
Zebra Technologies ZTC Z4Mplus - 200dpi	
+14.....	DARKNESS
2 IPS.....	PRINT SPEED
+000.....	TEAR OFF
TEAR OFF.....	PRINT MODE
CONTINUOUS.....	MEDIA TYPE
WEB.....	SENSOR TYPE
AUTO SELECT.....	SENSOR SELECT
THERMAL-TRANS.....	PRINT METHOD
104 0/8 MM.....	PRINT WIDTH
1300.....	LABEL LENGTH
39.0IN 989MM.....	MAXIMUM LENGTH
BIDIRECTIONAL.....	PARALLEL COMM.
RS232.....	SERIAL COMM.
57600.....	BAUD
8 BITS.....	DATA BITS
NONE.....	PARITY
XON/XOFF.....	HOST HANDSHAKE
NONE.....	PROTOCOL
000.....	NETWORK ID
NORMAL MODE.....	COMMUNICATIONS
<~> 7EH.....	CONTROL PREFIX
<^> 5EH.....	FORMAT PREFIX
<,> 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
CALIBRATION.....	MEDIA POWER UP
CALIBRATION.....	HEAD CLOSE
DEFAULT.....	BACKFEED
+000.....	LABEL TOP
+0000.....	LEFT POSITION
072.....	WEB S.
072.....	MEDIA S.
073.....	RIBBON S.
066.....	TAKE LABEL
007.....	MEDIA LED
000.....	RIBBON LED
+10.....	LCD ADJUST
DPSWFXM.....	MODES ENABLED
.....	MODES DISABLED
832 8/MM FULL.....	RESOLUTION
V44.12.4 <-.....	FIRMWARE
V23.0.0.54.....	HARDWARE ID
CUSTOMIZED.....	CONFIGURATION
NONE.....A:	COMPACT FLASH
3584k.....R:	RAM
NONE.....B:	MEMORY CARD
0512k.....E:	ONBOARD FLASH
NONE.....	FORMAT CONVERT
000 DISPLAY.....	P30 INTERFACE
LINER TAKEUP.....	OPTION
FW VERSION.....	IDLE DISPLAY
01/13/97.....	RTC DATE
07:13.....	RTC TIME
NONE.....	ZEBRA NET II

FIRMWARE IN THIS PRINTER IS COPYRIGHTED



Troubleshoot Printing Problems

If the configuration label did not print, or if the labels are aligned properly, review the items below in the order shown. Do only as many steps as needed to solve the printing problem.

- Review [Types of Media on page 10](#).
- Review [Load the Media on page 13](#).
- Configure the printer according to the directions given in [Basic Configuration on page 22](#).
- Check the position of the media sensor and move if necessary. Follow the directions in [Position the Label Sensor on page 26](#).

Basic Configuration

If your labels are not printing correctly, the configuration may need to be changed because the printer defaults may not reflect the options you need. Media, ribbon, darkness, print mode, media type, sensor type, and print method all affect the way the printer is configured. Refer to [Configuration on page 58](#) for more detailed information.

Review the Front Panel illustration on [page 3](#) to familiarize yourself with the controls. The table below shows the LCD display settings you will need and what they mean.

LCD Display	Meaning
PRINTER READY	Ready to print labels or to configure the printer. All printer self-tests have been performed successfully.
DARKNESS	The larger the number, the darker the print. The range is 0 to 30, with a default setting of 10.
PRINT SPEED	The print speed is given in inches per second. The larger the number, the faster the label prints.
TEAR OFF	Establishes the position of the media over the tear-off bar after printing.
PRINT MODE	Tear-Off (default setting), Peel-Off, Cutter, Rewind.
MEDIA TYPE	Non-continuous (default setting), Continuous
SENSOR TYPE	Web (default setting), Mark
SENSOR SELECT	Auto Select (default setting), Reflective, Transmissive
PRINT METHOD	Thermal transfer (default setting using a ribbon), Direct thermal (no ribbon)



Basic Configuration Process

See the instructions below to perform basic a configuration:

1. Enter the configuration mode by pressing **SETUP/EXIT**.
DARKNESS displays.
2. If there is no print darkness problem, press **PLUS (+)** to move to the next option, Print Speed.

If the labels moved forward, but the print is light or there is no print, increase the darkness.

If the print is too dark, or the ribbon sticks to the media, decrease the darkness.
3. Press **SELECT**.
4. Press **PLUS (+)** to increase the darkness or **MINUS (-)** to decrease the darkness.
5. Press **SELECT** to accept the change.
6. Press **PLUS (+)** to move to the next option.
PRINT SPEED displays.
7. If the image is crisp, press **PLUS (+)** to move to the next option, Tear-Off.

If the print is dark enough, but the image is not crisp, slow down the print speed.
Print speed is given in inches per second (ips).
8. Press **SELECT**.
9. Press **PLUS (+)** to increase the speed or **MINUS (-)** to decrease the speed.
10. Press **SELECT** to accept the changes.
11. Press **PLUS (+)** to move to the next option.
TEAR OFF displays.

The Tear Off position defines the position of the label on the tear-off bar. When working with non-continuous labels, the inter-label gap should be on the tear bar.

If the label gap is lining up on the tear bar, or if you are using continuous material, press **PLUS (+)** to move to the next option, Print Mode.
12. If the position of the label needs to be adjusted, press **SELECT**.
13. Press **PLUS (+)** to move the label forward or **MINUS (-)** to move the label back.
14. Press **SELECT** to accept the changes.

15. Press **PLUS (+)** to move to the next option.

PRINT MODE displays.

When the wrong Print Mode is selected, the top of the label is not found by the printer. Some examples of common problems are gaps between noncontinuous labels not lining up on the tear bar, or continuous media not being cut at the right interval.

If the labels line up correctly on the tear bar, press **PLUS (+)** to go to the next step, Media Type.

If the labels are not lined up correctly, review the media and the printer options, then adjust accordingly, continue with [Step 16](#).

16. Press **SELECT**.

17. Press **PLUS (+)** or **MINUS (-)** to scroll through the setting options. Stop at the setting that matches your printer options (Tear-Off, Peel-Off, Cutter, or Rewind)

18. Press **SELECT** to accept the change.

19. Press **PLUS (+)** to move to the next option,

MEDIA TYPE displays.

[Types of Media on page 10](#) showed examples of non-continuous and continuous media.

If your media matches the Media Type, press **PLUS (+)** to go to the next step, Sensor Type.

If your label media does not match the Media Type, follow the steps below.

20. Press **SELECT**.

21. Press **PLUS (+)** or **MINUS (-)** to scroll through the setting options. Stop at the setting that matches your printer options (Continuous or Noncontinuous).

22. Press **SELECT** to accept the change.

23. Press **PLUS (+)** to move to the next option.

SENSOR TYPE displays.

Web sensor is used with most labels, unless the label liner has black marks on the back.

If your liner does not have black marks, press **PLUS (+)** to go to the next step, Sensor Select.

If the label liner has black marks, continue with [Step 24](#).

24. Press **SELECT**.

25. Press **PLUS (+)** or **MINUS (-)** to scroll through the setting options. Stop at the setting that matches your printer options (Web or Mark).

26. Press **SELECT** to accept the change.

27. Press **PLUS (+)** to move to the next option.

SENSOR SELECT displays.

Auto Select is the default setting. Do not make any changes.

28. Press **PLUS (+)** to move to the next option.

PRINT METHOD displays.

- Use Thermal Transfer if you are using ribbon with your label material.
- Use Direct Thermal if you are not using ribbon. Direct thermal label media has ink embedded in the label material that is brought out by the heat of the printhead.

If the Print Method setting matches your media and ribbon choices, press **SETUP/EXIT** to leave the front panel menu,

SAVE CHANGES PERMANENT displays.

29. Press **SETUP/EXIT** again.

30. SAVING PERMANENT displays. One or more labels may feed out, depending on your setting choices.

The LCD displays **PRINTER READY**.

If the Print Method setting does not match your media and ribbon choices, follow the steps below.

31. Press **SELECT**.

32. Press **PLUS (+)** or **MINUS (-)** to scroll through the setting options. Stop at the setting that matches your printer options (Thermal Transfer or Direct Thermal).

33. Press **SELECT** to accept the change.

34. Press **SETUP/EXIT** to leave the front panel menu.

SAVE CHANGES PERMANENT displays.

35. Press **SETUP/EXIT** again.

SAVING PERMANENT displays. One or more labels may feed out, depending on your settings. The LCD displays **PRINTER READY**.

Position the Label Sensor

There are two media sensors in this printer: reflective and transmissive.

Reflective Sensor

The reflective sensor detects the start-of-label indicator (the notch, hole, black mark, or gap between die-cut labels).

The reflective sensor must be positioned:

- directly under the notch, hole, or black mark
- anywhere along the width of the media if there is a gap between labels

The glow of the red light through the media may help you accurately position the reflective sensor.



Note • If you are using continuous media, position the reflective sensor anywhere under the media to detect an out-of-paper condition. The reflective sensor is compatible with most types of media. If you have difficulties with calibration, use the transmissive sensor. See [Transmissive Sensor on page 28](#).

Adjust the Reflective Sensor

Refer to the illustration on the next page.

See the instructions below to adjust the reflective sensor:

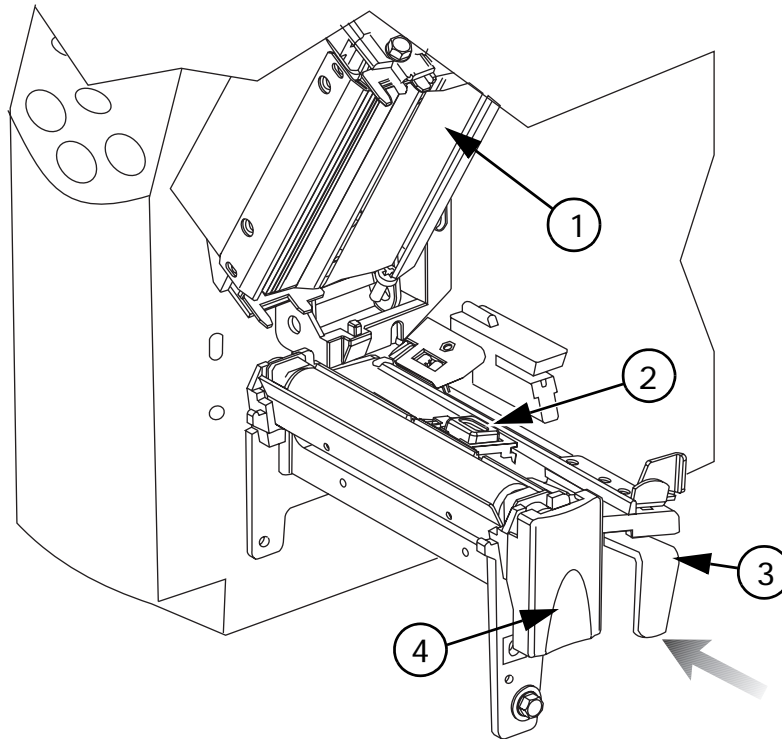
1. Open the printhead assembly by pressing the printhead open lever.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Locate the reflective sensor positioning lever.
3. Move the reflective sensor positioning lever across the width of the media until the reflective sensor aligns with the gap or notch. The glow of the red light assists in the proper placement of the reflective sensor.

4. Close the printhead assembly.

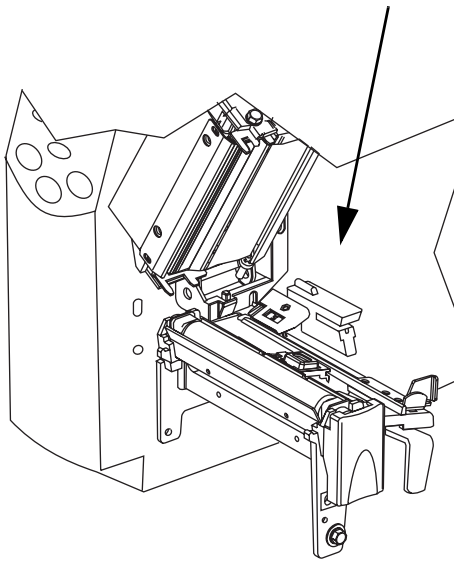


Number	Description
1	Printhead Assembly
2	Reflective Sensor
3	Adjustment Lever
4	Printhead Open Lever

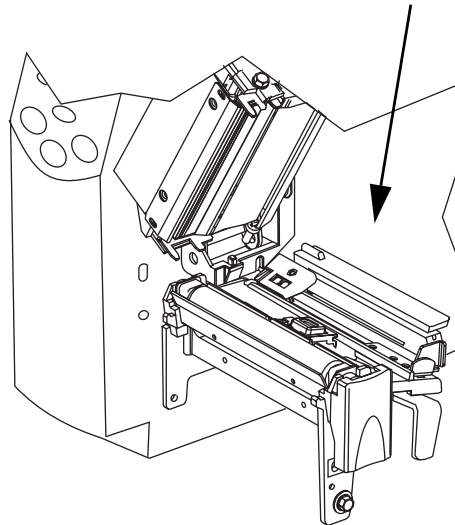
Transmissive Sensor

The standard transmissive sensor is in a fixed position and enabled from the front panel. For more detailed information, see [SENSOR SELECT on page 64](#).

Standard Transmissive Sensor



Adjustable Transmissive Sensor (Optional)



Configure the Software or Printer Driver

Many printer settings may also be controlled by your printer's driver or label preparation software. See the driver or software documentation for more information.

CHAPTER 3

Communication

This chapter describes communications options and their connections.

Contents

System Considerations	30
Interfaces	30
Cable Requirements	32

System Considerations

Interfaces

Standard interfaces: the RS-232 DB-9 serial data port, and IEEE 1284 compliant bi-directional parallel port.



Note • For further information on serial and parallel, pin-out, and technical information, see Appendices A and B, starting on [page 123](#).

Optional interfaces:

- Socket Card for PCMCIA cards



Note • For further information on PCMCIA cards, see Appendix C, starting on [page 135](#)

Optional PrintServers:

- ZebraNet PrintServer II (external)
- PS II Internal PrintServer (factory installed only)
Which enables the printer to be connected to 10Base-T Ethernet networks.



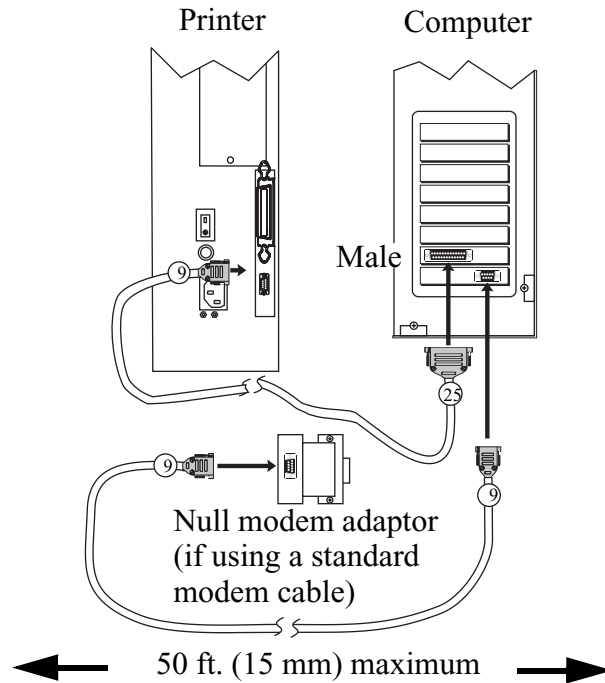
Note • For further information on PrintServer II, see the *PrintServer II User and Reference Guide* (Zebra part number 45537L).

Standard Interfaces

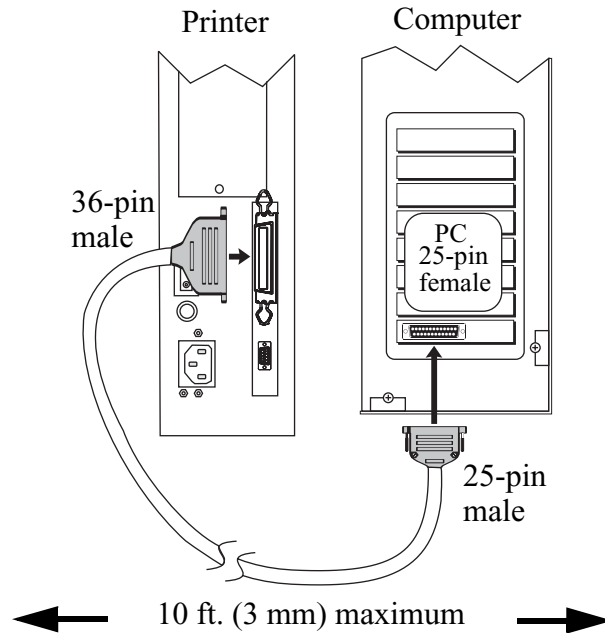
The standard serial and parallel interfaces are discussed in this section.

Serial Port Communicating using a serial data port (see illustration on next page) requires choosing the baud rate, number of data bits, stop bits, parity, and handshake (default settings are 9600 baud, 8 data bits, 1 stop bit, no parity, and XON/XOFF). Parity only applies to data transmitted by the printer since the parity of received data is ignored. See [Serial Data Communications](#) on [page 124](#) to configure the

communication parameters. The values selected must be the same as those used by the host equipment connected to the printer.



Parallel Port Communicating using the parallel port (see the parallel illustration below), does not require special settings. The serial settings do not affect the parallel port. Refer to [Parallel Data Port on page 131](#) for further information.



Cable Requirements



Note • Zebra printers comply with FCC Rules and Regulations, Part 15 for Class B equipment using fully shielded data cables. Use of unshielded cables may increase radiation above the Class B limits.

Data cables must be fully shielded and fitted with metal or metalized connector shells. Shielded cables and connectors are required to prevent radiation and reception of electrical noise.

To minimize electrical noise pickup in the cable:

- Keep data cables as short as possible.
- Do not bundle the data cables tightly with the power cords.
- Do not tie the data cables to power wire conduits.



Note • RS-422 and RS-485 applications should use twisted shielded pairs as recommended in the Appendix of the TIA/EIA-485 Specification.

CHAPTER 4

Printer Basics

This chapter provides instructions for loading media and ribbon.

Contents

Printer Overview	34
Front Panel	34
Load Roll Media	38
Tear-Off Mode	38
Cutter Mode	40
Peel-Off Mode	42
Liner Take-Up Mode	44
Rewind	47
Load Fanfold Media	54
Load the Ribbon	56
Remove the Ribbon	58

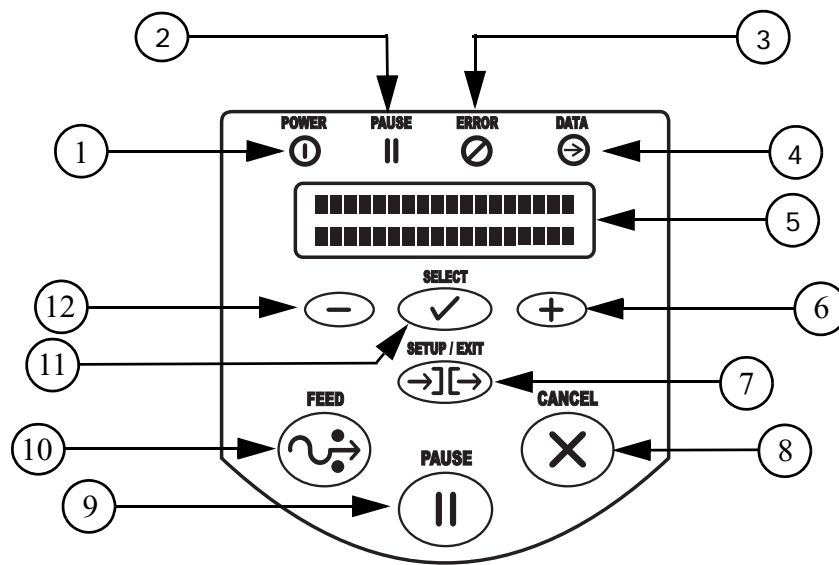
Printer Overview

This printer overview provides you the basics of printer controls and media loading.

Front Panel

The front panel display shows the printer's operating status and allows you to change settings as needed to work with your media and label formats.

The front panel keys and lights are shown below.





Number	Description
1	Power LED
2	Pause LED
3	Error LED
4	Data LED
5	LCD
6	PLUS (+) Key
7	SETUP/EXIT Key
8	CANCEL Key
9	PAUSE Key
10	FEED Key
11	SELECT Key
12	MINUS (–) Key

Front Panel Keys

Key	Function
FEED	Forces the printer to feed one blank label each time the key is pressed. Printer not printing: one blank label immediately feeds. Printing: one blank label feeds after the current batch of labels is complete.
PAUSE	Starts and stops the printing process. Printer not printing: no printing occurs. (Press PAUSE again to resume printing.) Printing: printing stops after the current label is complete.
CANCEL	Cancels print jobs when in the pause mode. Printer not printing: the next stored label format does not print. Printing: current label completes printing and the next label format is cancelled. Press and hold for several seconds to cancel all print jobs in memory.
SETUP/EXIT	Enters and exits the configuration mode.
SELECT	Toggles the function of PLUS (+) and MINUS (-) between the Scroll and Change Modes. Press once to use PLUS (+) and MINUS (-) to change the values of the selection. Press again to use PLUS (+) and MINUS (-) to scroll through the menu items.
PLUS (+) (scroll mode)	Scrolls to the next selection.
PLUS (+) (change mode)	Increases the value. Answers yes. Prints a label (when applicable).
MINUS (-) (scroll mode)	Scrolls to the previous selection.
MINUS (-) (change mode)	Decreases the value. Selects the digit you wish to change. Answers no.



Front Panel Lights

Light	Status	Indication
POWER	Off	The printer is off or no power is applied.
	On	The printer is on.
PAUSE	Off	Normal printer operation.
	On	The printer has stopped all printing operations.
	Flashing	Peel-Off Mode, the Pause light flashes when the label is available, and when initializing FLASH or PCMCIA memory.
ERROR	Off	Normal printer operation (no errors).
	Slow flashing	RIBBON IN warning, HEAD UNDER TEMP warning, or HEAD OVER TEMP error.
	Fast flashing	HEAD OPEN error.
	On	PAPER OUT, RIBBON OUT, or CUTTER JAM errors.
DATA	Off	Normal printer operation (no data being received or processed).
	One flash	CANCEL is pressed and a format is successfully cancelled.
	Slow flashing	The printer is unable to accept more data from the host.
	Fast flashing	The printer is receiving data.
	On	A partial format has been received and no subsequent data activity.

Load Roll Media

Tear-Off Mode

See the instructions below to load media in Tear-Off Mode:

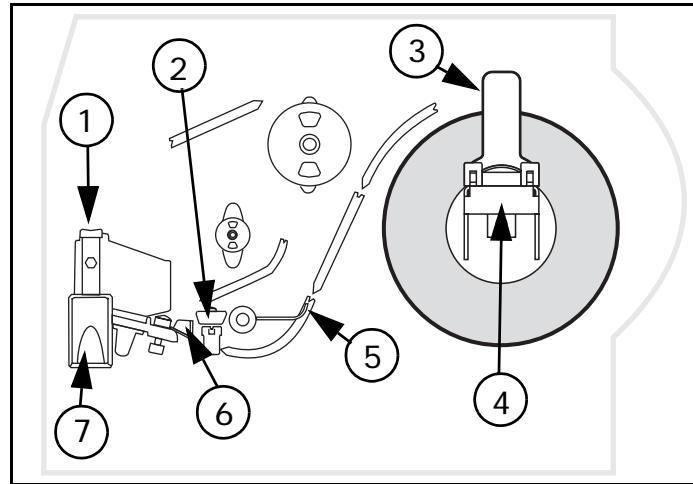
This is the default mode. The printer is set to this mode in the factory.

1. Press the printhead open lever. The printhead assembly springs up.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Flip down the media supply guide.
3. Slide out the media guide as far from the printer frame as possible.
4. Place the roll of media on the media supply hanger and orient the media properly.
5. Flip up the media supply guide.
6. Slide in the media supply guide until it touches, but does not restrict, the edge of the roll.
7. Feed the media under the dancer, through the slot in the transmissive sensor, under the ribbon sensor, and out the front of the printer.
8. Ensure the media is against the back of the transmissive sensor. Slide in the media guide until it touches, but does not restrict, the edge of the label.
9. Close the printhead assembly.
10. The printer is paused (the Pause light is on), press **PAUSE** to enable printing.



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Label Supply Guide
4	Label Supply Hanger
5	Dancer
6	Label Guide
7	Printhead Open Lever

Cutter Mode

See the instructions below to load media in Cutter-Off Mode:

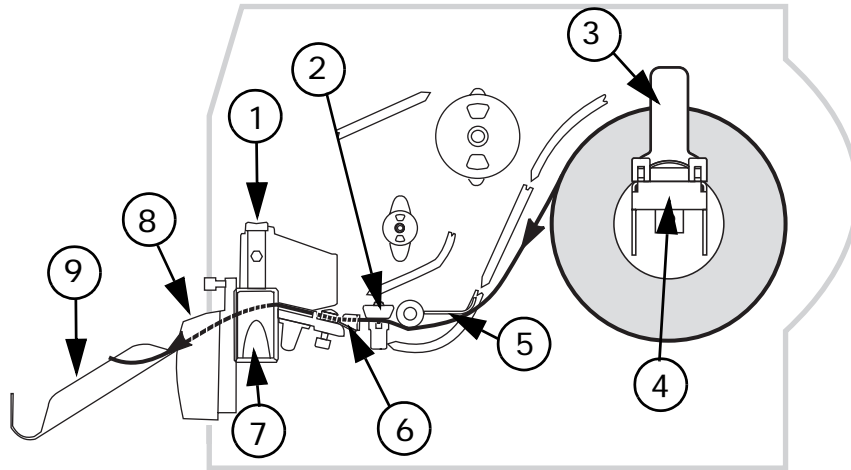
Cutter Mode requires that the cutter be installed.

1. Press the printhead open lever. The printhead assembly springs up.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Flip down the media supply guide.
3. Slide out the media guide as far from the printer frame as possible.
4. Place the roll of media on the media supply hanger and orient the media properly.
5. Flip up the media supply guide.
6. Slide in the media supply guide until it touches, but does not restrict, the edge of the roll.
7. Feed the media under the dancer, through the slot in the transmissive sensor, under the ribbon sensor, and through the cutter module.
8. Ensure that the media is against the back of the transmissive sensor. Then, slide in the media guide until it touches, but does not restrict, the edge of the media.
9. Close the printhead assembly.
10. The printer is paused (the Pause light is on), press **PAUSE** to enable printing.



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Label Supply Guide
4	Label Supply Hanger
5	Dancer
6	Label Guide
7	Printhead Open Lever
8	Cutter Module
9	Catch Tray

Peel-Off Mode

See the instructions below to load media in Peel-Off Mode:

This setting works only with the Peel-Off Option installed on the printer. An illustration of the printer with the Peel-Off Option is shown on the next page.

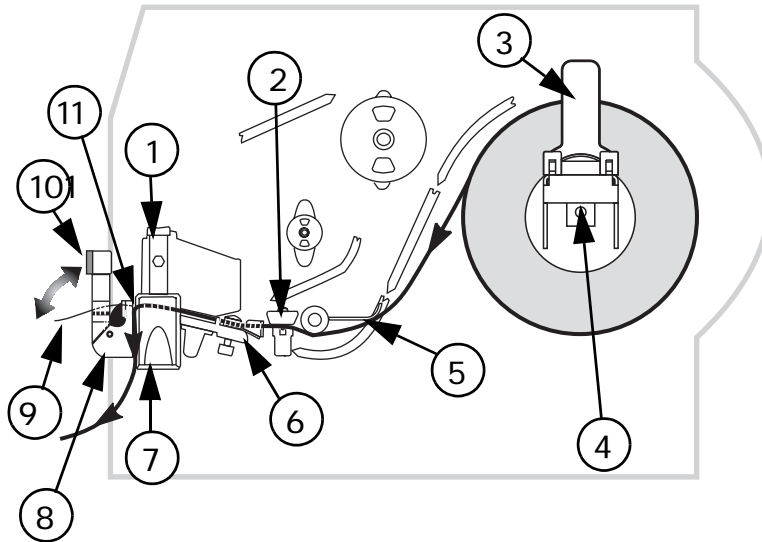
1. Press the printhead open lever. The printhead assembly springs up.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Flip down the media supply guide.
3. Slide the media guide as far from the printer main frame as possible.
4. Place a roll of media onto the media supply hanger as shown.
5. Flip up the media supply guide.
6. Slide in the media supply guide until it just touches, but does not restrict, the edge of the media.
7. Feed the media under the dancer, through the slot in the transmissive sensor, under the ribbon sensor, and through the Peel Assembly.
8. Pull approximately 12 in. (30 mm) of media through the front of the printer.
9. Ensure the media is against the rear of the transmissive sensor. Slide in the media guide until it just touches, but does not restrict, the edge of the media.
10. Pull down the peel lever to open the peel assembly.
11. Feed the liner over the tear-off/peel-off bar and behind the peel assembly.
12. Close the printhead assembly.
13. Close the peel assembly using the peel lever.
14. The printer is paused (the Pause light is on), press **PAUSE** to enable printing.

Peeling starts automatically. Press **FEED** to test.



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Media Supply Guide
4	Media Supply Hanger
5	Dancer
6	Media Guide
7	Printhead Open Lever
8	Peel Assembly
9	Label
10	Peel Lever
11	Tear-Off/Peel/Off Bar

Liner Take-Up Mode

See the instructions below to load media in Liner Take-Up Mode:

The Liner Take-up option must be installed to use this mode. The option is shown in the illustration on the next page.



Note • This option is available on the Z4Mplus printer only

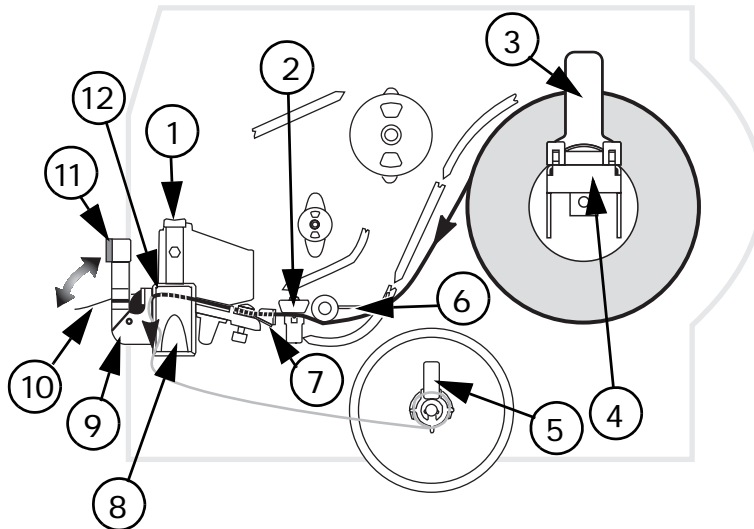
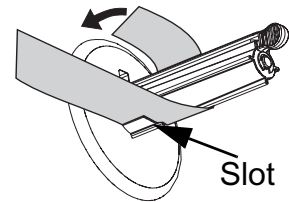
1. Press the printhead open lever. The printhead assembly springs up.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Flip down the media supply guide.
3. Slide the media guide as far from the main frame as possible.
4. Place a roll of media onto the media supply hanger as shown.
5. Flip up the media supply guide.
6. Slide in the media supply guide until it just touches, but does not restrict, the edge of the media.
7. Feed the media under the dancer, through the slot in the transmissive sensor, and under the ribbon sensor.
8. Pull approximately 18 in. (500 mm) of media through the front of the printer.
9. Remove the labels from the exposed media until only liner remains.
10. Ensure the media is against the back of the transmissive sensor. Slide in the media guide until it just touches, but does not restrict, the edge of the media.
11. Pull down the peel lever to open the peel assembly.
12. Feed the media over the tear-off/peel-off bar and behind the peel assembly.
13. Close the printhead assembly.
14. Close the peel assembly.

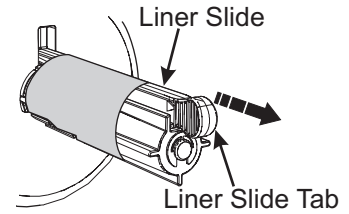
15. Slide the liner into the slot (see inset) in the spindle of the liner take-up. Ensure the liner is resting against the back plate of the spindle assembly.
16. Turn the spindle assembly counterclockwise a few times to snug the liner.
17. If the printer is paused (the pause light is on), press **PAUSE** to enable printing. Peeling starts automatically. Press **FEED** to test.



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Label Supply Guide
4	Label Supply Hanger
5	Liner Take-Up
6	Dancer
7	Label Guide
8	Printhead Open Lever
9	Peel Assembly
10	Label
11	Peel Lever
12	Tear-Off/Peel/Off Bar

Liner Removal

1. Pull the liner slide toward you (see inset) until it stops (about a third of the way down the liner take-up spindle).
2. Slide the liner from the take-up spindle.



Note • The liner slide moves back in place once the liner is removed.

Rewind

Peel Mode

See the instructions below to load media in Rewind/Peel Mode:

Refer to the illustration on the next page.

1. Press the printhead open lever. The printhead assembly springs up.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Flip down the media supply guide.
3. Slide the media guide as far from the main frame as possible.
4. Place the roll of labels on the media supply hanger as shown.
5. Flip up the media supply guide.
6. Slide in the media supply guide until it just touches, but does not restrict, the edge of the media.
7. Feed the labels under the dancer, through the slot in the transmissive sensor, and under the ribbon sensor.
8. Pull approximately 36 in. (900 mm) of label through the front of the printer.
9. Remove the labels from the first 18 in. (450 mm) of media.
10. Ensure the media is against the back of the transmissive sensor. Slide in the media guide until it touches, but does not restrict, the edge of the media.



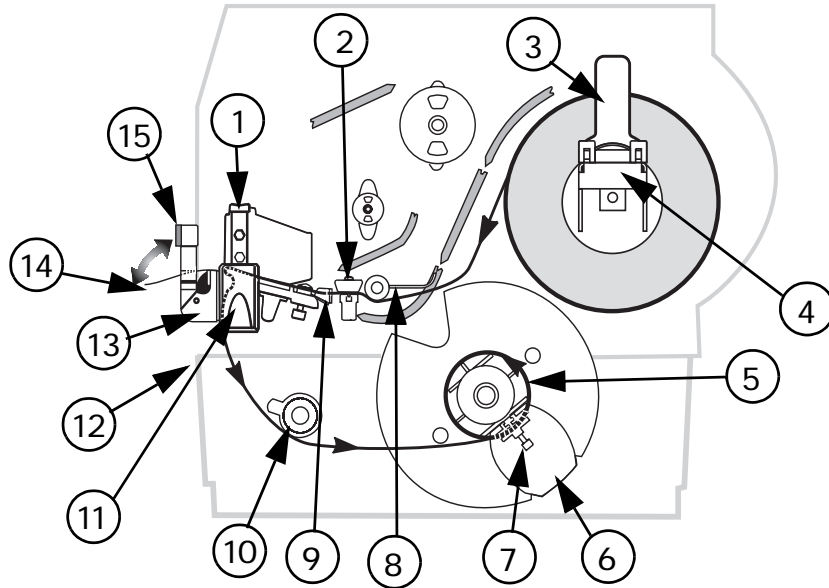
11. Pull down the peel lever to open the peel assembly.
12. Feed the media over the tear-off/peel-off bar, and through the slot in the peel assembly.
13. Loosen the thumbscrew and slide out the rewind media guide to the end of the take-up spindle.
14. Slide an empty core onto the take-up spindle; wrap the liner around the core and turn the take-up spindle counterclockwise to wind up the excess liner.



Note • The liner must be attached to the take-up spindle for the printer to operate properly. Ensure the edge of the liner is flush against the backplate of the take-up spindle.

15. Slide the rewind media guide against the liner and tighten the thumbscrew.
16. Close the printhead assembly.
17. Close the peel assembly using the peel lever.
18. If the printer is paused (the Pause light is on), press **PAUSE** to enable printing.

Peeling starts automatically. Press **FEED** to test.



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Label Supply Guide
4	Label Supply Hanger
5	Rewind Spindle
6	Rewind Label Guide
7	Thumbscrew
8	Dancer
9	Label Guide
10	Rewind Label Spindle
11	Printhead Open Lever
12	Peel Assembly
13	Label
14	Rewind Base Assembly
15	Peel Lever



Liner Removal

1. Cut the liner between the media alignment spindle and the take-up spindle.
2. Rotate the take-up spindle counterclockwise until the rewind media guide is in the 12 o'clock position.
3. Loosen the thumbscrew and slide the rewind media guide to the end of the take-up spindle.
4. Slide the core with the liner from the take-up spindle.

Rewind Mode

See the instructions below to load media in Rewind Mode:

Refer to the illustration on the next page.

1. Press the printhead open lever. The printhead assembly springs up.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

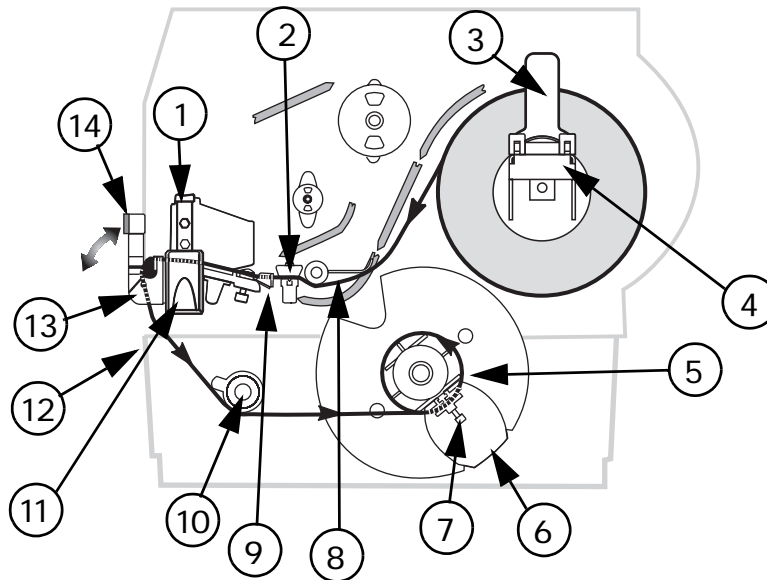
2. Flip down the media supply guide.
3. Slide the media guide as far from the main frame as possible.
4. Place a roll of media on the media supply hanger as shown.
5. Flip up the media supply guide.
6. Slide in the media supply guide until it just touches, but does not restrict, the edge of the media.
7. Feed the media under the dancer, through the slot in the transmissive sensor, and under the ribbon sensor.
8. Pull approximately 36 in. (900 mm) of media through the front of the printer.
9. Remove the labels from the first 18 in. (450 mm) of media.
10. Ensure the media is against the back of the transmissive sensor. Slide in the media guide until it just touches, but does not restrict, the edge of the media.
11. Feed the media over the peel assembly and through the rewind base assembly.
12. Loosen the thumbscrew and slide out the rewind media guide to the end of the take-up spindle.

13. Slide an empty core onto the take-up spindle; wrap the media around the core and turn the take-up spindle counterclockwise to wind up the excess material.



Note • The liner must be attached to the take-up spindle for the printer to operate properly. Ensure the edge of the liner is flush against the backplate of the take-up spindle.

14. Slide the rewind media guide against the media, and tighten the thumbscrew.
15. Close the printhead assembly.
16. The printer is paused (the Pause light is on), press **PAUSE** to enable printing.



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Label Supply Guide
4	Label Supply Hanger
5	Rewind Spindle
6	Rewind Label Guide
7	Thumbscrew
8	Dancer
9	Label Guide
10	Rewind Label Spindle
11	Printhead Open Lever
12	Rewind Base Assembly
13	Peel Assembly
14	Peel Lever

Media Removal

1. Cut the media between the media alignment spindle and the take-up spindle.
2. Rotate the take-up spindle counterclockwise until the rewind media guide is in the 12 o'clock position.
3. Loosen the thumbscrew and slide out the rewind media guide to the end of the take-up spindle.
4. Slide the core with the roll of media from the take-up spindle.

Load Fanfold Media

Fanfold media feeds through either the bottom or rear access slot.

Refer to the illustration on next page.

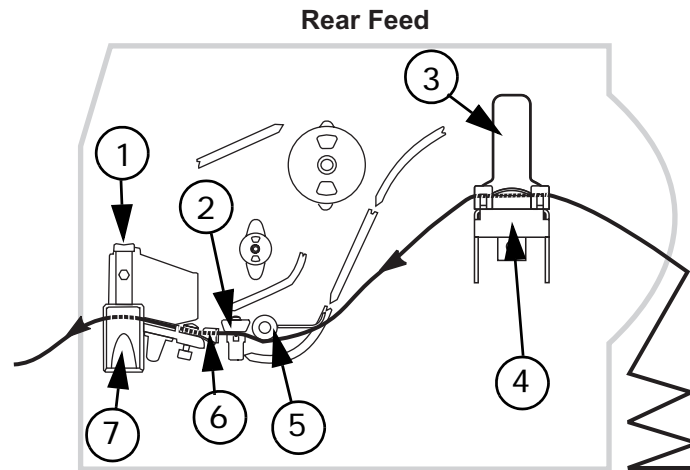
See the instructions below to load fanfold media:

1. Press the printhead open lever. The printhead assembly springs up.

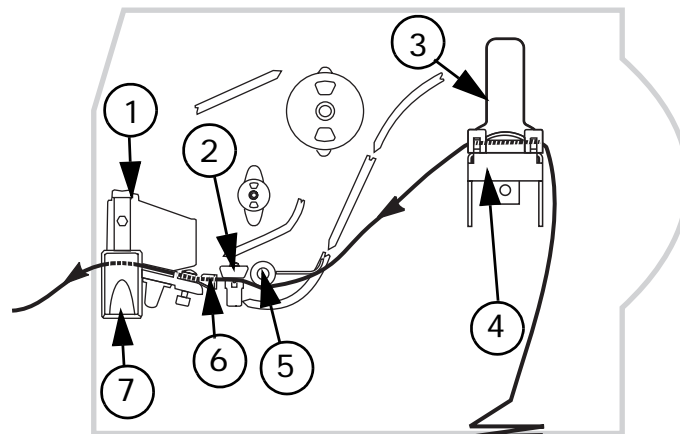


Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Flip down the media supply guide.
3. Slide the media guide as far from the main frame as possible.
4. Pass the fanfold media over the media supply hanger.
5. Flip up the media supply guide. Slide in the media supply guide until it just touches, but does not restrict, the edge of the media.
6. Thread the media under the dancer, through the slot in the transmissive sensor, under the ribbon sensor, and out the front of the printer.
7. Ensure the media is against the back of the transmissive sensor. Then, slide in the media guide until it just touches, but does not restrict, the edge of the media.
8. Close the printhead assembly.
9. Press **PAUSE**.



Bottom Feed



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Label Supply Guide
4	Label Supply Hanger
5	Dancer
6	Label Guide
7	Printhead Open Lever

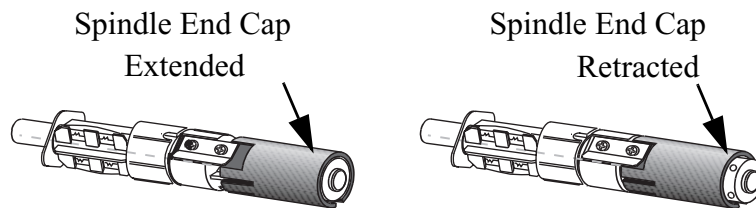
Load the Ribbon



Note • The ribbon supply spindle in your printer is a dual-tension variety. Most applications require the spindle to be in the normal position. The low tension position is recommended only when a wide ribbon is used or normal tension hampers the ribbon movement.

See the instructions below to load the ribbon:

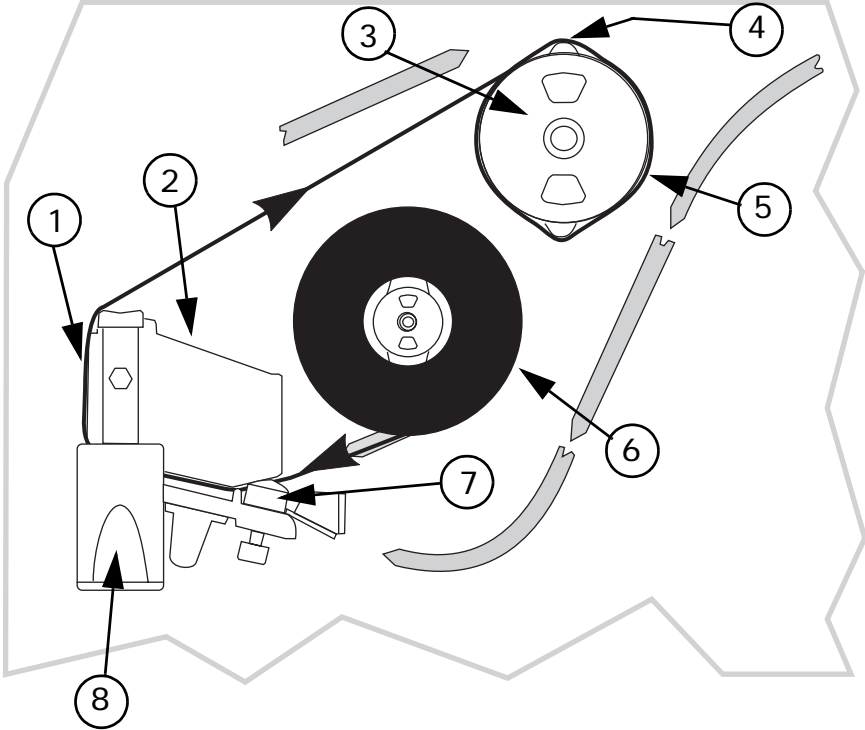
1. To place this spindle in the normal position, firmly pull out the spindle end cap until it clicks as shown in below.
2. To place the spindle in the low tension position, firmly push in the end cap until it clicks in place.



Note • Always use ribbon that is wider than the media. The smooth liner of the ribbon protects the printhead from wear. For direct thermal printing, do **not** load ribbon in the printer.

Refer to illustration on the next page.

3. Press the printhead open lever. The printhead assembly springs up.
4. Orient the ribbon as shown. Push the ribbon roll completely onto the ribbon supply spindle.
5. Pull the end of the ribbon over the ribbon sensor, under the printhead assembly, and out the front of the printer.
6. Hold the ribbon snug and free of wrinkles and in line with the guide mark near the left edge of the strip plate. Close the printhead assembly.
7. Wind the ribbon clockwise onto the ribbon take-up spindle.



Number	Description
1	Strip Plate
2	Printhead Assembly
3	Release Knob
4	Tension Blades
5	Ribbon Take-Up Spindle
6	Ribbon Supply Spindle
7	Ribbon Sensor
8	Printhead Open Lever

Remove the Ribbon

1. If the ribbon has not run out, break it between the strip plate and the ribbon take-up spindle.
2. While turning the ribbon take-up spindle release knob counter clockwise, squeeze the ribbon against the ribbon take-up spindle tension blades.
3. When the tension blades collapse into the ribbon take-up spindle, hold the release knob and rotate the spent ribbon toward the rear of the printer. Then, slide off the ribbon.



Note • Do not cut the ribbon on the ribbon take-up spindle. This may damage the spindle.

CHAPTER 5

Configuration

This chapter discusses detailed configuration settings.

Contents

Configuration	58
Enter Setup Mode	58
Change Password-Protected Parameters	59
Leave the Setup Mode	60
Configuration and Calibration Sequence	61

Configuration

After you have installed the media and ribbon, and the Power-On Self Test (POST) is complete, the front panel displays PRINTER READY. If the printer fails its POST, see [Troubleshooting on page 97](#). Use the front panel display and the four keys directly below it to set printer parameters for your application.



Note • Printers operating on an IP network can be quickly configured using ZebraLink WebView (optional ZebraNet PrintServer II required). For information, see *PrintServer II User and Reference Guide* (Zebra part number 45537L).

Enter Setup Mode

See the instructions below to enter the setup mode:

1. Press SETUP/EXIT:
2. Press **PLUS (+)** or **MINUS (-)** to scroll to the setting you wish to change.
3. Press **SELECT** to toggle the functionality of **PLUS (+)** and **MINUS (-)** keys.
4. Press **PLUS (+)** or **MINUS (-)** to increase or decrease the value, answer yes or no, print a label, or select the digit you wish to change.
5. Press **SELECT** again to use **PLUS (+)** and **MINUS (-)** to scroll to the desired menu item.



Note • An asterisk (*) in the upper left-hand corner of the display indicates that the value displayed is different than the currently stored value.



Change Password-Protected Parameters

Certain parameters are password protected by factory default.



Note • You have the option of making all parameters password protected. Refer to [PASSWORD LEVEL](#) on page 81 for details.

1. Enter a four-digit password at the ENTER PASSWORD display.
MINUS (–) changes the selected digit position. **PLUS** (+) increases the selected digit value. After entering the password, press **SELECT**. The parameter you wish to change is displayed. If the password was entered correctly, you can now change the value.
2. The default password is 1234. The password can be changed using the ^KP (Define Password) ZPL II instruction.

Leave the Setup Mode



Note • Once the password has been entered correctly, it does not have to be entered again unless you leave and re-enter the programming mode using **SETUP/EXIT**.

Note • You can disable the password protection feature to no longer prompt you for a password by setting the password to 0000 via the ^KP0 ZPL/ZPL II command. To re-enable the password-protection feature, send the ZPL/ZPL II command ^KPx, where x can be any number that is one to four digits in length, except 0.

You can leave the program mode at any time by pressing **SETUP/EXIT**. The **SAVE CHANGES** display appears. There are five choices, which are described below. Pressing **PLUS (+)** or **MINUS (-)** displays other choices and pressing **SELECT** selects the displayed choice.

- **PERMANENT** — Permanently saves the changes. Values are stored in the printer even when power is turned off.
- **TEMPORARY** — Saves the changes until you change them again or until power is turned off.
- **CANCEL** — Cancels all changes from the time you pressed **SETUP/EXIT**, except for darkness and tear-off settings (if they were changed).
- **LOAD DEFAULTS** — Loads factory defaults.
- **LOAD LAST SAVE** — Loads values from the last permanent save.

Press **SETUP/EXIT** again to save your choice.



Configuration and Calibration Sequence

Display Shows	Action/Explanation
PRINTER READY	Normal printer operation.
Set Print Parameters	
DARKNESS	<p>Press SELECT to make change.</p> <p>Adjusting Print Darkness: Press PLUS (+) to increase darkness. Press MINUS (-) to decrease darkness.</p> <p>Default: +10 Range: 0 to +30</p> <p>Press SELECT to accept the change.</p> <p>Darkness settings are dependent upon a variety of factors, including ribbon type, media, and the condition of the printhead. You may adjust the darkness for consistent high-quality printing.</p> <p>If printing is too light, or if there are voids in printed areas, increase the darkness. If printing is too dark, or if there is spreading or bleeding of printed areas, decrease the darkness.</p> <p>Feed Self Test on page 111 can also be used to determine the best darkness setting. Since the darkness setting takes effect immediately, you can see the results on labels that are currently printing.</p> <p>Set the darkness to the lowest setting that provides good print quality. Darkness set too high may cause ink smearing or it may burn through the ribbon.</p> <p>Darkness settings may also be changed by the driver or software settings.</p>
PRINT SPEED	<p>Press SELECT to make change.</p> <p>Adjusting print speed: Press PLUS (+) to increase print speed and MINUS (-) to decrease print speed. Speed is measured in inches per second (ips). The default is 2 ips.</p> <p>Press SELECT to accept the change.</p>

Display Shows	Action/Explanation
TEAR OFF	<p>Press SELECT to make change.</p> <p>Adjusting the Tear-off Position: Press PLUS (+) to increase the value, press MINUS (-) to decrease the value. Each press adjusts the tear-off position by four dot rows.</p> <p>Default: +0</p> <p>Range: -120 to +120</p> <p>Press SELECT to accept the change.</p> <p>This parameter establishes the position of the media over the tear-off/peel-off bar after printing. The label and liner can be torn off or cut between labels.</p>
PRINT MODE	<p>Press SELECT to make change.</p> <p>Selecting Print Mode: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Tear-off</p> <p>Selections: Tear-off, cutter, peel-off, rewind</p> <p>Press SELECT to accept the change.</p> <p>Print mode settings tell the printer the method of media delivery that you wish to use. Be sure to select a print mode that your hardware configuration supports as some selections displayed are for optional printer features.</p>



Display Shows	Action/Explanation
MEDIA TYPE	<p>Press SELECT to make change.</p> <p>Setting Media Type: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Non-Continuous</p> <p>Selections: Non-continuous, Continuous</p> <p>Press SELECT to accept the change.</p> <p>This parameter tells the printer the type of media you are using. Selecting continuous media requires that you include a label length instruction in your label format (^LLxxxx if you are using ZPL or ZPL II).</p> <p>When non-continuous media is selected, the printer feeds media to calculate label length (the distance between two detections of the inter-label gap, webbing, or alignment notch or hole).</p>
SENSOR TYPE	<p>Press SELECT to make change.</p> <p>Setting the Sensor Type: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Web</p> <p>Selections: Web, mark</p> <p>Press SELECT to accept the change.</p> <p>This parameter tells the printer whether you are using media with a web (gap or space between labels, notch, or hole) to indicate the separation between labels or if you are using media with a black mark printed on the back. If your media does not have black marks on the back, leave your printer at the default setting (web).</p>

Display Shows	Action/Explanation
SENSOR SELECT	<p>Press SELECT to make change.</p> <p>Setting the Sensor Select: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Auto select</p> <p>Selections: Auto select, reflective, transmissive</p> <p>Press SELECT to accept the change.</p> <p>This parameter tells the printer the sensor you wish to use. Auto Select is compatible with most types of media. However, if you encounter difficulties with calibration, see Types of Media on page 10 to help you choose the appropriate sensor for your media. Select the reflective sensor with either continuous or non-continuous black mark media; choose the transmissive sensor if you are using noncontinuous web media.</p>
PRINT METHOD	<p>Press SELECT to make change.</p> <p>Selecting Print Method: Press PLUS (+) for the next value; press MINUS (-) for the previous value.</p> <p>Default: Thermal transfer</p> <p>Selections: Thermal transfer, direct thermal</p> <p>Press SELECT to accept the change.</p> <p>The print method parameter tells the printer the method of printing you wish to use: direct thermal (no ribbon) or thermal transfer (using thermal transfer media and ribbon). Selecting direct thermal when using thermal transfer media and ribbon creates a warning condition, but printing continues.</p>



Display Shows	Action/Explanation
PRINT WIDTH	<p>Press SELECT to make change.</p> <p>Setting Print Width: Press PLUS (+) to increase the value, press MINUS (-) to decrease the value. To change the unit of measurement, press MINUS (-) until the unit of measurement is active, then press PLUS (+) to toggle to a different unit of measure (inches, mm, or dots).</p> <p>Default; Range: The default and range of acceptable values may vary depending on what printer you have. See Printing Specifications on page 115 for further information about the ranges available for your model.</p> <p>Press SELECT to accept the change.</p> <p>Print width determines the printable area across the width of the label.</p>
MAXIMUM LENGTH	<p>Press SELECT to make change.</p> <p>Setting Maximum Length: Press PLUS (+) to increase the value, press MINUS (-) to decrease the value. Default is 39 in. (991 mm) for non-continuous material.</p> <p>Press SELECT to accept the change.</p> <p>Always set the value to at least 1 in. (25.4 mm) longer than the longest label to be used in the printer.</p>
LIST FONTS	<p>Press SELECT to select.</p> <p>List Fonts: Press PLUS (+) to print a label listing all of the available fonts.</p> <p>This selection is used to print a label that lists all of the fonts currently available in the printer, including standard printer fonts plus any optional fonts. Fonts may be stored in RAM, FLASH memory, font EPROMs, or font cards.</p>
LIST BAR CODES	<p>Press SELECT to select.</p> <p>List Bar Codes: Press PLUS (+) to print a label listing all of the available bar codes.</p> <p>This selection is used to print a label that lists all of the bar codes currently available in the printer.</p>

Display Shows	Action/Explanation
LIST IMAGES	<p>Press SELECT to select.</p> <p>List Images: Press PLUS (+) to print a label listing all of the available images.</p> <p>This selection is used to print a label that lists all of the images currently stored in the printer's RAM, FLASH memory, optional EPROM, or optional memory card.</p>
LIST FORMATS	<p>Press SELECT to select.</p> <p>List Formats: Press PLUS (+) to print a label listing all of the available formats.</p> <p>This selection is used to print a label that lists all of the formats currently stored in the printer's RAM, FLASH memory, optional EPROM, or optional memory card.</p>
LIST SETUP	<p>Press SELECT to select.</p> <p>List Setup: Press PLUS (+) to print a label listing the current printer configuration.</p> <p>This selection is used to print a label that lists the current printer configuration information. (Same as Cancel Self Test on page 109.)</p>
LIST ALL	<p>Press SELECT to select.</p> <p>List All: Press PLUS (+) to print a label listing all of the available fonts, bar codes, images, formats, and the current printer configuration.</p> <p>This selection is used to print a label that lists the five previous selections, as described.</p>



Display Shows	Action/Explanation
<p>FORMAT CARD</p> <p>A B</p>	<p>Initialize Memory Card</p> <p>Caution • Perform this operation only when it is necessary to erase all previously stored information from the optional memory card. Press PLUS (+) to bypass this function.</p> <p>Press SELECT to make change. If your printer is set to require a password, you are prompted to enter the password. Enter the password and then press SELECT.</p> <p>Press the PLUS (+) to select B memory (PCMCIA card) or press MINUS (-) to select the A memory (internal compact flash).</p> <p>The front panel LCD asks ARE YOU SURE?.</p> <p>Press PLUS (+) YES to begin initialization.</p> <p style="text-align: center;">or</p> <p>Press MINUS (-) No to cancel the request and return to the INITIALIZE CARD prompt.</p> <p>FORMATTING CARD displays. When formatting is complete, FORMAT CARD displays.</p> <p>Press SELECT to accept the change.</p> <p>Depending on the amount of memory in the memory card, initialization may take up to three minutes to complete.</p>

Display Shows	Action/Explanation
INIT FLASH MEM	<p>Initialize Flash Memory</p> <p>Caution • Perform this operation only when it is necessary to erase all previously stored information from the FLASH memory. Press SELECT to make change.</p> <p>Press SETUP/EXIT to bypass this function.</p> <p>Press PLUS (+) to select YES.</p> <p>If your printer is set to require a password, you are prompted to enter the password. Enter the password and then press SELECT.</p> <p>The display asks INITIALIZE FLASH?. Press PLUS (+) to select YES.</p> <p>The front panel LCD asks ARE YOU SURE?.</p> <p>Press PLUS (+) YES to begin initialization.</p> <p>or</p> <p>Press MINUS (-) No to cancel the request and return to INITIALIZE FLASH prompt.</p> <p>Press SETUP/EXIT followed by SELECT. If initialization is still in process, the front panel display flashes back and forth between the two phrases CHECKING E: MEMORY and PRINTER IDLE.</p> <p>When initialization is complete, the printer automatically exits the configuration mode and the front panel displays PRINTER READY.</p> <p>Depending on the amount of free FLASH memory, initialization may take up to one minute to complete.</p>

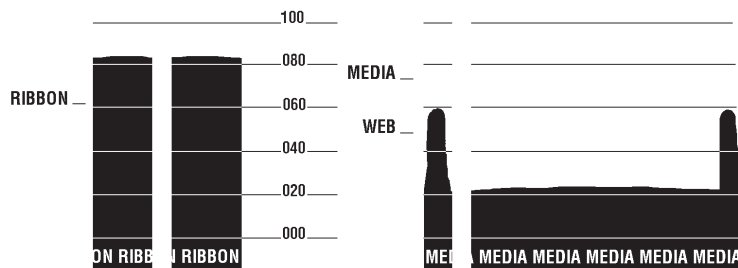


Display Shows	Action/Explanation
Media and Ribbon Sensor Calibration	
<p>Performing the manual calibration procedure resets the sensitivity of the sensors to detect the media and ribbon you are using more accurately. With the sensors at their new sensitivity, the printer then performs the manual calibration. Changing the type of ribbon and/or media may require resetting the sensitivity of the media and ribbon sensors.</p>	
SENSOR PROFILE	<p>Press SELECT to make change.</p> <p>Sensor Profile: Press PLUS (+) to print a media sensor profile.</p> <p>The media sensor profile may be used to troubleshoot registration problems that may be caused when the media sensor detects preprinted areas on the media or experiences difficulty in determining web location. If the sensitivity of the media and/or ribbon sensors MUST be adjusted, use the manual calibration procedure.</p>
MEDIA AND RIBBON	<p>Press SELECT to display MEDIA AND RIBBON CALIBRATE.</p> <p>Manual Calibration: Press PLUS (+) to start the calibration procedure.</p> <p>This procedure is used to reset the sensitivity of the media and ribbon sensors. The manual calibration is then performed.</p>
LOAD BACKiNG	<p>Open the printhead.</p> <p>Remove approximately 8 in. (200 mm) of labels from the media roll, enough so that only the liner material is threaded between the media sensors when the media is loaded.</p> <p>Close the printhead.</p> <p>To cancel the operation, press MINUS (-).</p>
REMOVE RiBBON	<p>Open the printhead.</p> <p>Remove the ribbon (sliding it as far to the right as possible has the same effect as removing it).</p> <p>Close the printhead.</p> <p>To cancel the operation, press MINUS (-).</p>

Configuration

Configuration and Calibration Sequence

Display Shows	Action/Explanation
CALIBRATING PLEASE WAIT	The printer automatically adjusts the scale (gain) of the signals it receives from the media and ribbon sensors based on the specific media and ribbon combination you are using. On the sensor profile, this corresponds to moving the graph up or down to optimize the readings for your application.
RELOAD ALL	When RELOAD ALL is displayed: Open the printhead and pull the media forward until a label is positioned under the media sensor. Move the ribbon back to its proper position. Close the printhead.
MEDIA AND RIBBON CALIBRATE	Now that the scale has changed, the printer performs another calibration. During this process, the printer checks the readings for the media and ribbon based on the new scale you have established, determines the label length, and determines whether you are in Direct Thermal or Thermal Transfer Print Mode. The process is now complete. To see the new readings on the new scale, print a sensor profile. See illustration below. Press SELECT to accept the calibration. Press Plus (+) to go to the next display.





Display Shows	Action/Explanation
Setting Communication Parameters	
Communication parameters must be set correctly for the printer to communicate with the host computer. These parameters make sure that the printer and host computer are speaking the same language. All communication parameters are password protected.	
PARALLEL COMM	<p>Press SELECT to make change.</p> <p>Setting Parallel Communications: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Bidirectional</p> <p>Selections: Bidirectional, Unidirectional</p> <p>Note • Unidirectional will not support ZNet two-way communications.</p> <p>Press SELECT to accept the change.</p>
SERIAL COMM	<p>Press SELECT to make change.</p> <p>Setting Serial Communications: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: RS-232</p> <p>Selections: RS-232, RS-422/485, RS-485 multidrop</p> <p>Press SELECT to accept the change.</p> <p>Select the communications port that matches the one being used by the host computer.</p>
BAUD	<p>Press SELECT to make change.</p> <p>Setting Baud: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: 9600</p> <p>Selections: 110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200</p> <p>Press SELECT to accept the change.</p> <p>The baud setting of the printer must match the baud setting of the host computer for accurate communications to take place. Select the value that matches the one being used by the host computer.</p>

Display Shows	Action/Explanation
DATA BITS	<p>Setting Data Bits: Press the INCREMENT (+) or DECREMENT (-) key to display other choices.</p> <p>Default: 7-bits</p> <p>Selections: 7-bits, 8-bits</p> <p>The data bits of the printer must match the data bits of the host computer for accurate communications to take place. Set the data bits to match the setting being used by the host computer.</p> <p>Note • Must be set to 8 data bits to use Code Page 850.</p>
PARITY	<p>Press SELECT to make change.</p> <p>Setting Parity: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: None</p> <p>Selections: None, even, odd</p> <p>Press SELECT to accept the change.</p> <p>The parity of the printer must match the parity of the host computer for accurate communications to take place. Select the parity that matches the one being used by the host computer.</p>
HOST HANDSHAKE	<p>Press SELECT to make change.</p> <p>Setting Host Handshake: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: XON/XOFF</p> <p>Selections: XON/XOFF, DTR/DSR, RTS/CTS</p> <p>Press SELECT to accept the change.</p> <p>The handshake protocol of the printer must match the handshake protocol of the host computer for communications to take place. Select the handshake protocol that matches the one being used by the host computer.</p>



Display Shows	Action/Explanation
PROTOCOL	<p>Press SELECT to make change.</p> <p>Setting Protocol: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: None</p> <p>Selections: None, Zebra, ACK_NACK</p> <p>Press SELECT to accept the change.</p> <p>Protocol is a type of error checking system. Depending on the selection, an indicator may be sent from the printer to the host computer signifying that data has been received. Select the protocol that is requested by the host computer. Further details on protocol can be found in the <i>ZPL II Programming Guide Volume I</i>.</p> <p>Zebra is the same as ACK_NACK except that with Zebra the response messages are sequenced.</p> <p>If Zebra is selected, printer must use DTR/DSR host handshake protocol.</p>
NETWORK ID	<p>Press SELECT to make change.</p> <p>Setting Network ID: Press MINUS (-) to move to the next digit position, press PLUS (+) to increase the value of the digit.</p> <p>Default: 000</p> <p>Range: 000 to 999</p> <p>Press SELECT to accept the change.</p> <p>Network ID is used to assign a unique number to a printer used in an RS-422/RS-485 network. This gives the host computer the means to address a specific printer. If the printer is used in a network, you must select a network ID number. This does not affect TCP/IP or IPX networks.</p>

Display Shows	Action/Explanation
COMMUNICATIONS	<p>Press SELECT to make change.</p> <p>Setting Communications Mode: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Normal mode</p> <p>Selections: Normal mode, diagnostics</p> <p>Press SELECT to accept the change.</p> <p>The communication diagnostics mode is a troubleshooting tool for checking the interconnection between the printer and the host computer. When “diagnostics” is selected, all data sent from the host computer to the printer is printed as straight ASCII hex characters. The printer prints all characters received including control codes, like CR (carriage return). A sample printout is shown on page 112.</p> <p>Notes • on diagnostic printouts:</p> <p>FE indicates a framing error.</p> <p>OE indicates an overrun error.</p> <p>PE indicates a parity error.</p> <p>NE indicates noise.</p> <p>For any errors, check that your communication parameters are correct. Set the print width equal to or less than the label width used for the test. See page 65 for more information.</p>



Display Shows	Action/Explanation
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Selecting Prefix and Delimiter Characters

Prefix and delimiter characters are 2-digit hex values used within the ZPL/ZPL II formats sent to the printer. The printer uses the last prefix and delimiter characters sent to it, whether from a ZPL II instruction or from the front panel.

DO NOT use the same hex value for the control, format, and delimiter character. The printer needs to see different characters to function properly.

CONTROL PREFIX	<p>Press SELECT to make change.</p> <p>Control Prefix Character: Press MINUS (–) to move to the next digit position, press PLUS (+) to increase the value of the digit.</p> <p>Default: 7E (tilde - displayed as a black square)</p> <p>Range: 00 to FF</p> <p>Press SELECT to accept the change.</p> <p>The printer looks for this 2-digit hex character to indicate the start of a ZPL/ZPL II control instruction.</p>
FORMAT PREFIX	<p>Press SELECT to make change.</p> <p>Format Prefix Character: Press MINUS (–) to move to the next digit position, press PLUS (+) to increase the value of the digit.</p> <p>Default: 5E (caret)</p> <p>Range: 00 to FF</p> <p>Press SELECT to accept the change.</p> <p>The printer looks for this 2-digit hex character to indicate the start of a ZPL/ZPL II format instruction.</p>

Display Shows	Action/Explanation
DELIMITER CHAR	<p>Press SELECT to make change.</p> <p>Delimiter Character: Press MINUS (–) to move to the next digit position, press PLUS (+) to increase the value of the digit.</p> <p>Default: 2C (comma)</p> <p>Range: 00 to FF</p> <p>Press SELECT to accept the change.</p> <p>The delimiter character is a 2-digit hex value used as a parameter place marker in ZPL/ZPL II format instructions. See the <i>ZPL II Programming Guide Volume I</i> for more information.</p>
Selecting ZPL Mode	
ZPL MODE	<p>Press SELECT to make change.</p> <p>Selecting ZPL Mode: Press PLUS (+) or MINUS (–) to display other choices.</p> <p>Default: ZPL II</p> <p>Selections: ZPL II, ZPL</p> <p>Press SELECT to accept the change.</p> <p>The printer remains in the selected mode until it is changed by this front panel instruction or by using a ZPL/ZPL II command. The printer accepts label formats written in either ZPL or ZPL II. This eliminates the need to rewrite any ZPL formats you already have. See the <i>ZPL II Programming Guide Volume II</i> for more information on the differences between ZPL and ZPL II.</p>

Display Shows	Action/Explanation
Power-Up and Head Close Parameters	
MEDIA POWER UP	<p>Press SELECT to make change.</p> <p>Media Power Up: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Calibration</p> <p>Selections: Calibration, length, no motion, and feed</p> <p>Press SELECT to accept the change.</p> <p>This parameter establishes the action of the media when the printer is turned on.</p> <p>Calibration: Recalibrates the media and ribbon sensors.</p> <p>Feed: Feeds the label to the first web.</p> <p>Length: Determines the length of the label.</p> <p>No Motion: Media does not move.</p>
HEAD CLOSE	<p>Press SELECT to make change.</p> <p>Head Close: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Calibration</p> <p>Selections: Calibration, length, no motion, and feed</p> <p>Press SELECT to accept the change.</p> <p>Determines the action of the media after the printhead has been opened and then closed.</p> <p>Calibration: Recalibrates the media and ribbon sensors.</p> <p>Feed: Feeds the label to the first web.</p> <p>Length: Determines the length of the label.</p> <p>No Motion: Media does not move.</p>

Display Shows	Action/Explanation
Label Positioning Parameters	
BACKFEED	<p>Press SELECT to make change.</p> <p>Backfeed Sequence: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Default (90%)</p> <p>Selections: Default, after, before, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, off</p> <p>Press SELECT to accept the change.</p> <p>This parameter establishes when and how much label backfeed occurs after a label is removed or cut in the peel-off or cutter modes. It has no effect in rewind or tear-off modes. This parameter setting can be superseded by the ~JS instruction when received as part of a label format (see the <i>ZPL II Programming Guide Volume I</i>).</p> <p>The difference between the value entered and 100% establishes how much backfeed occurs before the next label is printed. For example, a value of 40 means that 40% of the backfeed takes place after the label is removed or cut. The remaining 60% takes place before the next label is printed. A value of “before” means that all backfeed takes place before the next label is printed.</p>
LABEL TOP	<p>Press SELECT to make change.</p> <p>Adjusting Label Top Position: Press PLUS (+) to increase the value, press MINUS (-) to decrease the value. The displayed value represents dots.</p> <p>Default: +0</p> <p>Range: -120 to +120 dot rows</p> <p>Press SELECT to accept the change.</p> <p>The label top position adjusts the print position vertically on the label. Positive numbers adjust the label top position further down the label (away from the printhead); negative numbers adjust the position up the label (toward the printhead).</p>



Display Shows	Action/Explanation
LEFT POSITION	<p>Press SELECT to make change.</p> <p>Adjusting Left Position: Press MINUS (–) to move to the next position, press PLUS (+) to change between + and to increase the value of the digit. The displayed value represents dots.</p> <p>Default: 0000</p> <p>Range: –9999 to +9999</p> <p>Press SELECT to accept the change.</p> <p>For a negative value, enter the value before changing to the minus sign.</p> <p>This parameter establishes how far from the left edge of a label the format begins to print by adjusting horizontal positioning on the label. Positive numbers adjust the printing to the left by the number of dots selected; negative numbers shift printing to the right.</p>
WEB S.	Press SELECT to make change.
MEDIA S.	These parameters are automatically set during the calibration procedure. They should only be changed by a qualified service technician. See the <i>Maintenance Manual</i> for more information on these parameters.
RIBBON S.	
TAKE LABEL S.	
MEDIA LED	Press PLUS (+) repeatedly to skip these parameters.
RIBBON LED	
LCD ADJUST	<p>Press SELECT to make change.</p> <p>LCD Display Adjustment: Press MINUS (–) to decrease the value (reduce brightness), press PLUS (+) to increase the value (increase brightness).</p> <p>Range: 00 to 19</p> <p>Press SELECT to accept the change.</p> <p>This parameter allows you to adjust the brightness of your display if your display is difficult to read.</p>

Display Shows	Action/Explanation
FORMAT CONVERT	<p>Press SELECT to make change.</p> <p>Note • The Format Convert setting is used when upgrading from a printer of lower resolution to a printer of higher resolution and the user does not wish to modify their formats.</p> <p>Example: If your original formats were written for a 150 dpi printer and your new printer is 300 dpi, you would choose 150-300.</p> <p>Format Convert: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: None</p> <p>Selections: None, 150–300, 150–600, 200–600, 300–600</p> <p>Press SELECT to accept the change.</p>
IDLE DISPLAY	<p>If RTC is installed.</p> <p>Idle Display: Press SELECT to change. Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: FW Version</p> <p>Selections: FW Version, MM/DD/YY 24HR, MM/DD/YY 12HR, DD/MM/YY 24HR, DD/MM/YY 12HR</p> <p>Press SELECT to accept the change.</p> <p>This parameter selects the LCD options for the real-time clock.</p>
RTC DATE	<p>If RTC is installed.</p> <p>RTC Date: Press SELECT to change. Press PLUS (+) to change value, press MINUS (-) to change position.</p> <p>This parameter allows changing of the date.</p>
RTC TIME	<p>If RTC is installed.</p> <p>RTC Time: Press SELECT to change. Press PLUS (+) to change value, press MINUS (-) to change position.</p> <p>Press SELECT to accept the change.</p> <p>This parameter allows changing of time.</p>



Display Shows	Action/Explanation
PASSWORD LEVEL	<p>Press SELECT to make change.</p> <p>Password Level: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Selected items</p> <p>Selections: Selected items, all items</p> <p>Press SELECT to accept the change.</p> <p>This parameter allows you to select whether certain Zebra-selected menu items (selected items) or all menu items (all items) are password protected.</p>
IP RESOLUTION*	<p>Press SELECT to make change.</p> <p>IP Resolution: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Dynamic</p> <p>Selections: Dynamic, permanent</p> <p>Press SELECT to accept the change.</p> <p>Depending on the selection, allows either the user (permanent) or the server (dynamic) to select the IP address. For more information, see <i>ZebraNet Networking: PrintServer II Installation and Users Guide</i>.</p>
IP PROTOCOLS*	<p>Press SELECT to make change.</p> <p>IP Protocols: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: All</p> <p>Selections: All, gleaning only, RARP, BOOTP, DHCP, DHCP/BOOTP</p> <p>Press SELECT to accept the change.</p> <p>If dynamic was chosen in the previous parameter, this selection determines the method(s) by which the PrintServer II receives the IP address from the server. For more information, see <i>ZebraNet Networking: PrintServer II Installation and Users Guide</i>.</p>

Display Shows	Action/Explanation
IP ADDRESS*	<p>Press SELECT to make change.</p> <p>IP Address: Press MINUS (–) to move to the next digit position, press PLUS (+) to increase the value of the digit.</p> <p>This parameter allows you to select the IP address if permanent was chosen in IP RESOLUTION. (If dynamic was chosen, the user cannot select the address.) For more information, see <i>ZebraNet Networking: PrintServer II Installation and Users Guide</i>.</p>
SUBNET MASK*	<p>Press SELECT to make change.</p> <p>Subnet Mask: Press PLUS (+) or MINUS (–) to display other choices.</p> <p>Default: Permanent (user <i>must</i> set)</p> <p>Selections: Dynamic (user <i>may</i> set, but server can assign), permanent</p> <p>Press SELECT to accept the change.</p> <p>This parameter selects the part of the IP address that is considered to be part of the local network. It can be reached without going through the default gateway.</p>
DEFAULT GATEWAY*	<p>Press SELECT to make change.</p> <p>Default Gateway: Press MINUS (–) to move to the next digit position, press PLUS (+) to increase the value of the digit.</p> <p>Press SELECT to accept the change.</p> <p>This parameter allows you to select the IP address that the network traffic is routed through if the destination address is not part of the local network.</p>

* External ZebraNet PrintServer II or Cobra Internal option required

Display Shows	Action/Explanation
LANGUAGE	<p>Press SELECT to make change.</p> <p>Selecting the Display Language: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: English</p> <p>Selections: English, Spanish, French, German, Italian, Norwegian, Portuguese, Swedish, Danish, Spanish 2, Dutch, Finnish, Japanese</p> <p>Press SELECT to accept the change.</p> <p>This parameter allows you to change the language used on the front panel display.</p>
<p>You have now completed the entire configuration and calibration sequence. You may either press SELECT or SETUP/EXIT.</p>	
DARKNESS	<p>You are now back at the first parameter in the configuration sequence.</p> <p>If you pressed SELECT but are through programming the printer configuration, you may press SETUP/EXIT and continue with the SAVE SETTINGS function.</p>

Display Shows	Action/Explanation
SAVE SETTINGS	<p>Save Settings: Press PLUS (+) or MINUS (-) to display other choices.</p> <p>Default: Permanent</p> <p>Selections: Permanent, temporary, cancel, load defaults, load last save</p> <p>Press SELECT to accept the change.</p> <p>This display appears when you attempt to exit the configuration mode.</p> <p>Permanent: Permanently saves the changes, even when printer power is turned off.</p> <p>Temporary: Saves the changes until you change the values again or until power is turned off.</p> <p>Cancel: Cancels all changes from the time you entered the configuration mode except for darkness and tear-off position (if they were changed).</p> <p>Load defaults: Loads factory defaults.</p> <p>Load last save: Loads the values from the last permanent save.</p>
PRINTER READY	<p>Press SETUP/EXIT to activate the displayed choice.</p> <p>You have exited the configuration and calibration sequence and are now ready for normal printer operation.</p>

CHAPTER 6

Routine Care and Adjustments

This chapter discusses printer cleaning and minor adjustments.

Contents

Cleaning Procedures	86
Clean the Exterior	87
Clean the Interior	87
Clean the Sensors	89
Clean the Rewind Option	90
Clean the Peel-Off Assembly	92
Clean the Cutter Module	93

Cleaning Procedures

Specific cleaning procedures are provided on the following pages. Below is a recommended cleaning schedule.

Area	Method	Interval	
Printhead	Solvent*	Direct Thermal Mode: After every roll of media (or 500 feet of fanfold media).	
Platen roller	Solvent*		
Media sensors	Air blow	Thermal Transfer Mode: After every roll of ribbon or three rolls of media.	
Ribbon sensor	Air blow		
Media path	Solvent*	These intervals are intended as guidelines only. You may have to clean more often, depending upon your application and media.	
Ribbon path	Solvent*		
Pinch roller. (Optional peel-off option required. Refer to page 92.)	Solvent*		
Cutter Module	Solvent*		
	If cutting continuous, pressure-sensitive media	Solvent*	After every roll of media (or more often, depending upon your application and media).
	If cutting tag stock or label liner material	Solvent* and air blow	After every two or three rolls of media.
Tear-off/peel-off bar	Solvent*	Once a month.	
Take label sensor	Air blow	Once every six months.	

* Zebra recommends using the Preventive Maintenance Kit, Part Number 47362 or a solution of 90% Isopropyl and 10% deionized water)



Note • Zebra Technologies Corporation will not be responsible for damage caused by the use of cleaning fluids on the Z4Mplus/Z6Mplus printer.

Clean the Exterior

The exterior surfaces of the printer may be cleaned with a lint-free cloth. Do not use harsh or abrasive cleaning agents or solvents. If necessary, a mild detergent or desktop cleaner may be used sparingly.

Clean the Interior

Remove any accumulated dirt and lint from the interior of the printer using a soft bristle brush or vacuum cleaner.

Clean the Printhead and Platen Roller

You can minimize printhead wear and maintain print quality with regular preventive measures.

Avoid abrasion

Over time, the movement of media/ribbon across the printhead wears through the protective ceramic coating, exposing and eventually damaging the print elements (dots). In order to avoid abrasion:

- Clean your printhead frequently and use well-lubricated thermal transfer ribbons with packaging optimized to reduce friction.
- Minimize printhead pressure and burn temperature settings by optimizing the balance between the two.
- Ensure that the thermal transfer ribbon is as wide or wider than the label media to prevent exposing the elements to the more abrasive label material.

Clean the printhead regularly

For best results, perform the following cleaning procedure after changing every roll of ribbon. Inconsistent print quality, such as voids in the bar code or graphics, may indicate a dirty printhead.

Routine Care and Adjustments

Cleaning Procedures



Note • The printer can remain on while you are cleaning the printhead. In this way all label formats, images, and all temporary parameter settings stored in the printer's internal memory are saved. In addition, keep the peel engaged while cleaning the platen roller (media must be unloaded to do this) to reduce the risk of bending the tear-off/peel-off bar.

To clean the printhead, refer to the open printhead illustration on the next page and follow these steps:

1. Open the printhead assembly.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

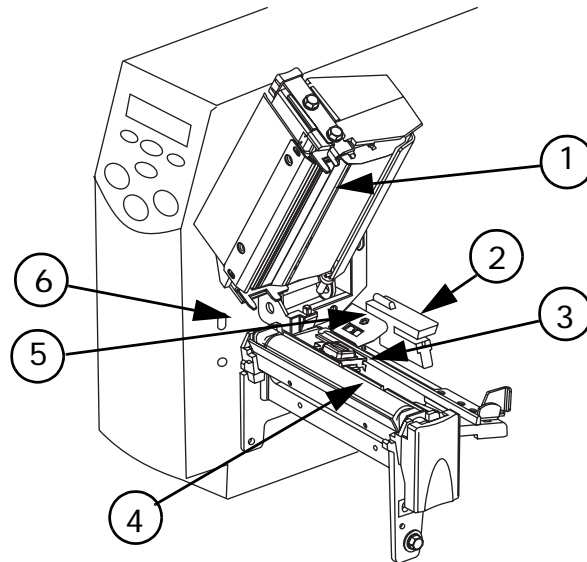
2. Remove the media and ribbon.
3. Using the Preventive Maintenance Kit (Zebra part number 47362) or a solution of 90% Isopropyl and 10% deionized water and swab, wipe along the print elements from end to end. The print elements are on the brown strip just behind the chrome strip on the printhead. Allow sufficient time for the solvent to evaporate.
4. Manually rotate the platen roller and clean thoroughly with solvent and a pad.
5. Brush or vacuum any accumulated paper lint and dust away from the media and ribbon paths.
6. Reload media or ribbon, and close the printhead assembly.



Note • If print quality has not improved after performing this procedure, try cleaning the printhead with *Save-A-Printhead* cleaning film. This specially coated material removes contamination buildup without damaging the printhead. Call your authorized Zebra reseller for more information.

Routine Care and Adjustments

Cleaning Procedures



Number	Description
1	Printhead Assembly
2	Transmissive Sensor
3	Reflective Sensor
4	Platen Roller
5	Ribbon Sensor
6	Take-Label Sensor

Clean the Sensors

Brush or vacuum any accumulated paper lint and dust away from the printer sensors. Refer to the illustration above. The reflective sensor, transmissive sensor, and ribbon sensor should be cleaned on a regular basis to ensure proper operation of the printer. For printers with the peel-off, liner take-up, and/or rewind option(s) installed, clean the take label sensor as well.

Clean the Rewind Option

The Rewind option is required.

Refer to the illustration on next page and perform the following procedure if adhesive buildup begins to affect peel performance.

1. Open the printhead assembly.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Close the peel assembly to prevent bending the tear-off/peel-off bar during cleaning. Using the Preventive Maintenance Kit (Zebra part number 47362) or a solution of 90% Isopropyl and 10% deionized water and swab, remove excess adhesive from the tear-off/peel-off bar.



Note • Apply minimum force when cleaning the tear-off/peel-off bar! Excessive force can cause the tear-off/peel-off bar to bend. This can have a negative effect on peel performance.

3. Open the peel assembly by pivoting the module toward you.
4. Manually rotate the pinch roller and clean thoroughly with solvent and a swab.
5. Close the peel assembly.

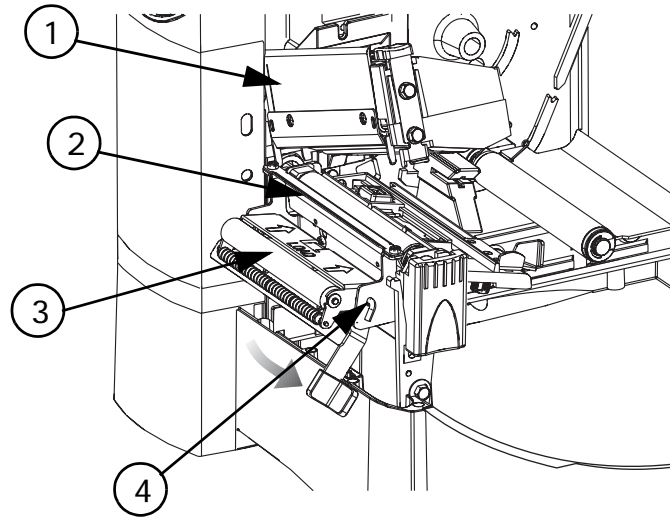


Note • When cleaning the tear-off/peel-off bar or the pinch roller, remove excess solvent with a pad to ensure the solvent has dried before printing.

6. Close the printhead assembly.

Routine Care and Adjustments

Cleaning Procedures



Number	Description
1	Printhead Assembly
2	Tear-Off/Peel-Off Bar
3	Pinch Roller
4	Peel Assembly

Clean the Peel-Off Assembly

The Peel-Off option is required.

Refer to the illustration on the previous page and perform the following procedure if adhesive buildup begins to affect peel-off performance.

1. Open the printhead assembly.



Caution • Ensure printhead is fully open and engaged in the up position. Failure to latch in the up position could result in the printhead falling on your hand during the procedure.

2. Close the peel assembly to prevent bending the tear-off/peel-off bar during cleaning. Using the Preventive Maintenance Kit (Zebra part number 47362) or a solution of 90% Isopropyl and 10% deionized water and a swab, remove excess adhesive from the tear-off/peel-off bar.
3. Open the peel assembly by pivoting the module toward you.



Note • Apply minimum force when cleaning the tear-off/peel-off bar. Excessive force can cause the tear-off/peel-off bar to bend, which could have a negative effect on peel performance.

4. Manually rotate the pinch roller and clean thoroughly with solvent and a swab.
5. Close the peel assembly.



Note • When cleaning the tear-off/peel-off bar or the pinch roller, remove excess solvent with a pad to ensure the solvent has dried before printing.

6. Close the printhead assembly.

Clean the Cutter Module

Cutter option required.



Caution • For personnel safety, always turn off and unplug the printer before performing this procedure.

Refer to the illustration on the next page and the procedures below to clean adhesive off of the upper and lower cutter blades:

1. Remove the cutter shield by removing the thumbscrew and lock washer.



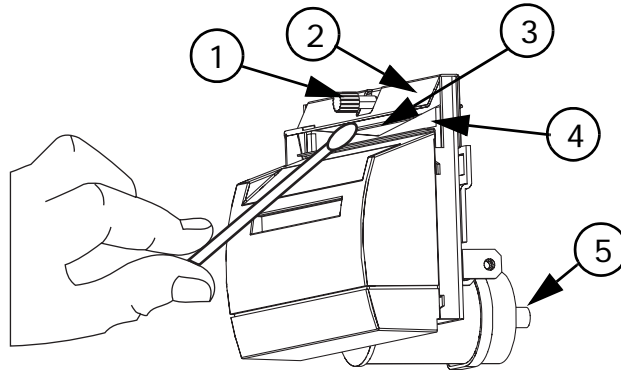
Caution • Cutter blade is sharp. Use caution when cleaning. Do not rub the blade with your fingers.

2. Using the Preventive Maintenance Kit (Zebra part number 47362) or a solution of 90% Isopropyl and 10% deionized water and swab, wipe along the upper cutter blade.
3. To expose the lower cutter blade, turn the cutter motor thumbnut counterclockwise until you see the “V”-shaped lower cutter blade.
4. Clean the lower blade, following the instructions in step 2.
5. Replace the cutter shield.
6. When you have finished cleaning the cutter module, plug in and turn on the printer. The lower cutter blade returns to its correct operating position.

If the cutter continues to perform unsatisfactorily, contact an authorized service technician.

Routine Care and Adjustments

Cleaning Procedures



Number	Description
1	Thumbscrew and Lock Washer
2	Cutter Shield
3	Upper Cutter Blade
4	Lower Cutter Blade

Lubrication

No lubrication is needed for this printer.

Fuse Replacement

Caution • Some commercially available lubricants will damage the finish and the mechanical parts if used.

A user-replaceable AC power fuse is located just below the AC power switch at the rear of the printer. The replacement fuse is a 5 × 20 mm fast blow style rated at 5 Amp/250 VAC.



Caution • Before replacing the fuse, turn off the AC power switch and unplug the AC power cord.

Perform the following procedure to replace the fuse:

1. To replace the fuse, insert the tip of a flat blade screwdriver into the slot in the end of the fuse holder end cap.
2. Press in slightly on the end cap and turn the screwdriver slightly counter clockwise. This disengages the end cap from the fuse holder and permits removal of the fuse.
3. To install a new fuse, remove the old fuse and insert the new fuse into the fuse holder.
4. Push the end cap in slightly, then insert the tip of a flat blade screwdriver into the slot in the end cap and turn clockwise to engage it.



CHAPTER 7

Troubleshooting

This chapter discusses typical problems and their probable solutions.

Content

LCD Error Conditions and Warnings	98
Error Conditions	98
Warnings	101
Print Quality Problems	103
Calibration	105
Communication Problems	106
Printer Diagnostics	108
Power-On Self Test	108
Additional Printer Self Tests	108
Cancel Self Test	109
Pause Self Test	110
Feed Self Test	111
Communications Diagnostics Test	112

LCD Error Conditions and Warnings

The LCD displays error condition messages and warnings if the printer detects a problem. The messages, along with their causes and solutions, are listed below.

Error Conditions

Error condition — RIBBON OUT

Problem	Solution
In thermal transfer mode, the ribbon is not loaded <i>or</i> loaded incorrectly.	Load the ribbon correctly. See Load the Ribbon on page 54 .
In thermal transfer mode, the ribbon sensor is not sensing correctly loaded ribbon.	Perform the media and ribbon sensor calibration (see page 15).

Error condition — RIBBON IN

Problem	Solution
In direct thermal mode, when ribbon is not used:	Put the printer in direct thermal mode via the front panel and remove ribbon. Ensure that the printer driver or software settings are correctly set.

Error condition — PAPER OUT

Problem	Solution
The media is not loaded <i>or</i> loaded incorrectly.	Reload the media. See Load Roll Media beginning on page 38 .
The media sensor is not positioned properly.	Check the position of the reflective sensor. See Position the Label Sensor on page 26 .
The printer is set for non-continuous media, but continuous media is loaded.	<p>Either load the correct media or set the printer for the correct media type via the front panel.</p> <p>Ensure that the printer driver or software settings are correctly set.</p> <p>Calibrate the printer (see page 15).</p>
The incorrect media sensor is being used.	Via the front panel, locate the SENSOR SELECT menu item (page 64) and manually select the correct sensing method.

Error condition — HEAD OPEN

Problem	Solution
The printhead is not fully closed.	Close the printhead.
The ribbon is loaded incorrectly; it is covering the head open sensor.	Correctly align the ribbon with the guide mark on the strip plate before closing the printhead assembly. See Position the Label Sensor on page 26 .
Print method is incorrectly set.	Via the front panel, locate the PRINT METHOD menu item (page 64) and select thermal transfer mode. Ensure that the printer driver and/or software settings are correctly set.
The ribbon is loaded.	Remove the ribbon and set the printer to direct thermal mode. See PRINT MODE on page 62 . Ensure that the printer driver and/or software settings are correctly set.

Warnings

Warning — HEAD OVER TEMP



Caution • The printhead is hot and can cause severe burns. Allow the printhead to cool.

Problem	Solution
The printhead is over temperature.	Allow the printer to cool. Printing automatically resumes when the printhead elements cool to an acceptable operating temperature.

Warning — HEAD UNDER TEMP



Caution • The printhead is hot and can cause severe burns. Allow the printhead to cool.

Problem	Solution
The printhead is under temperature.	<p>Continue printing while the printhead reaches the correct operating temperature.</p> <p>The environment may be too cold for proper printing. Relocate the printer to a warmer area.</p>

Warning — CUTTER JAM



Caution • Cutter blade is sharp. Use caution when cleaning. Do not rub the blade with your fingers.

Problem	Solution
Cutter blade is in the media path.	Turn off the printer power and unplug the printer. Inspect the cutter module for debris and clean as needed following the cleaning instructions on page 93 .

OUT OF MEMORY*

Problem	Solution
*There is not enough memory to perform the function shown on the second line of the error message.	Insufficient DRAM for the label length, downloaded fonts/graphics, and images. Ensure that the device, such as FLASH memory or PCMCIA card, is installed and not write protected or full. Ensure that the data is not directed to a device that is not installed or available.



Print Quality Problems

General print quality issues

Problem	Solution
You are using an incorrect media and ribbon combination for your application.	Consult your authorized Zebra reseller/distributor for information and advice.
The printer is set at an excessive print speed to achieve optimal quality.	For optimal print quality, set the print speed to a lower setting via ZPL II, the driver, software, or front panel.
The printer is set at an excessive darkness level to achieve optimal quality.	For optimal print quality, set the darkness level to a lower setting via the front panel, the driver, or the software.
The printhead is dirty.	Clean the printhead according to the instructions on page 87 .
There is light printing (or no printing) on the left or right side of the label <i>or</i> the printed image is not sharp.	The pressure adjustment dials need to be adjusted. Follow the printhead pressure adjustment instructions on page 17 .

Gray lines on blank labels with no consistent pattern

Problem	Solution
The printhead is dirty.	Clean the printhead according to the instructions on page 87 .

Light, consistent vertical lines running through all labels

Problem	Solution
The printhead or platen roller is dirty.	Clean the printhead, platen roller, or both according to the instructions on page 87 .

Intermittent creases on the left and right edges of the label

Problem	Solution
There is too much pressure on the printhead.	Reduce the printhead pressure. See Set Printhead Pressure on page 17.

Wrinkled ribbon

Problem	Solution
The ribbon is not loaded correctly.	Load the ribbon correctly. See Load the Ribbon on page 54.
The darkness setting is incorrect.	Set the darkness to the lowest possible setting for good print quality. See DARKNESS on page 61.
Incorrect printhead pressure or balance.	Set the pressure to the minimum required for good print quality. See Set Printhead Pressure on page 17.
The media is not feeding correctly. It is walking from side to side.	Make sure that the media guide and media supply guide touch the edge of the media.



Calibration

Problem	Solution
<p>Loss of printing registration on labels. Excessive vertical drift in top-of-form registration.</p>	<p>Adjust the reflective sensor position. See page 26.</p> <p>Set the printer for the correct media type. See page 63.</p> <p>Ensure that the media guides are properly positioned.</p> <p>Via the front panel, locate the SENSOR SELECT menu item (page 64) and manually select the correct sensing method.</p> <p>Reload the media. Check the reflective sensor position (see page 26).</p> <p>Clean the platen roller according to the instructions on page 87.</p>
<p>Auto Calibrate failed.</p>	<p>Perform a manual calibration (see page 69).</p> <p>Reload the media and ensure the reflective sensor is properly positioned (see page 26).</p>

Communication Problems

Data light does not flash when a label format is sent.

Problem	Solution
The printer does not respond to label requests.	<p>Check the printer driver or software communications settings.</p> <p>Confirm you are using the correct communication cable. See Cable Requirements on page 32.</p> <p>Via the front panel, check the protocol setting. It should be set to the default none. See page 73.</p> <p>Ensure that the correct driver is being used.</p>

Several labels print, then the printer skips, misplaces, misses, or distorts the image on the label after a label is sent to the printer.

Problem	Solution
The host is set to EPP parallel communications.	Change the settings on the computer host to standard parallel communications.
The serial communication settings are incorrect.	<p>Standard RS-232 cables are appropriate for lengths under 50 ft. (15.2 m); RS-422 and RS-485 cables allow serial transmission up to 4000 ft. (1.2 km). Check cable length and shielding, and confirm the appropriate RS-232, RS-422, or RS-485 setting is being used.</p> <p>Check the printer driver or software communications settings.</p>

A label format was sent to the printer but not recognized. The DATA light flashes but no printing occurs.



Problem	Solution
The prefix and delimiter characters set in the printer do not match the ones in the label format.	Verify the prefix and delimiter characters. See page 75 .
Incorrect data is being sent to the printer.	Check the communication settings on the computer. Ensure they match the printer settings.

Printer Diagnostics

Power-On Self Test

A Power-On Self Test (POST) is performed automatically each time the printer is turned on. During this test sequence, the front panel lights and liquid crystal display (LCD) monitor the progress of the POST. If the printer fails any of these tests, the word FAILED is display. If this occurs, notify an authorized Zebra reseller.

Additional Printer Self Tests

These self tests produce sample printouts and provide specific information that help determine the operating conditions for the printer.

Each self test is enabled by pressing a specific front panel key or combination of keys while turning the printer On (I). Keep the key(s) depressed until the DATA light turns off (approximately five seconds). When the Power-On Self Test is complete, the selected self test starts automatically.



Note • When performing self tests, avoid sending a label format to the printer. In the case of a remote host, disconnect all data interface cables from the printer.

- When cancelling a self test prior to its actual completion, always turn the printer Off (O) and then back on to reset the printer.
- When performing these self tests while in the Peel-Off Mode, you must remove the labels as they become available.
- If your media is not wide enough or long enough, unexpected or undesired results may occur. Ensure your print width is set correctly for the media you are using before you run any self tests, otherwise the test may print out on the platen roller. See [page 65](#) for information on setting the print width.

Cancel Self Test

This self test prints a listing of the configuration parameters currently stored in the printer's memory. See the labels below. Depending on the options ordered, your label may look different.

Perform the following procedure to complete the Cancel Self Test:

1. Turn the printer Off (O).
2. Press and hold CANCEL while turning the printer On (I).
3. Release CANCEL after the DATA light turns off (approximately five seconds).

PRINTER CONFIGURATION	
Zebra Technologies ZTC Z6Mplus - 300dpi	
+14.....	DARKNESS
2 IPS.....	PRINT SPEED
+000.....	TEAR OFF
TEAR OFF.....	PRINT MODE
NON-CONTINUOUS.....	MEDIA TYPE
WEB.....	SENSOR TYPE
AUTO SELECT.....	SENSOR SELECT
THERMAL-TRANS.....	PRINT METHOD
168 00/12 MM.....	PRINT WIDTH
1222.....	LABEL LENGTH
39.01N 988MM.....	MAXIMUM LENGTH
BIDIRECTIONAL.....	PARALLEL COMM.
RS232.....	SERIAL COMM.
9600.....	BAUD
8 BITS.....	DATA BITS
NONE.....	PARITY
XON/XOFF.....	HOST HANDSHAKE
NONE.....	PROTOCOL
000.....	NETWORK ID
NORMAL MODE.....	COMMUNICATIONS
<~> 7EH.....	CONTROL PREFIX
<^> 5EH.....	FORMAT PREFIX
<.> 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
CALIBRATION.....	MEDIA POWER UP
CALIBRATION.....	HEAD CLOSE
DEFAULT.....	BACKFEED
-040.....	LABEL TOP
+0000.....	LEFT POSITION
016.....	WEB S.
064.....	MEDIA S.
071.....	RIBBON S.
061.....	TAKE LABEL
017.....	MEDIA LED
132.....	RIBBON LED
+10.....	LCD ADJUST
DPSWFXM.....	MODES ENABLED
1984 12/MM FULL.....	MODES DISABLED
V44.12.4 <-.....	RESOLUTION
V22.0.0.54.....	FIRMWARE ID
CUSTOMIZED.....	HARDWARE ID
3584k.....R:	CONFIGURATION
2560k.....E:	RAM
NONE.....	ONBOARD FLASH
000 DISPLAY.....	FORMAT CONVERT
VALUE PEEL REWIND.....	P30 INTERFACE
FW VERSION.....	OPTION
02/13/01.....	IDLE DISPLAY
08:25.....	RTC DATE
NONE.....	RTC TIME
AV31890.03JDR050114.....	ZEBRA NET II
	33008.01.VH1

FIRMWARE IN THIS PRINTER IS COPYRIGHTED

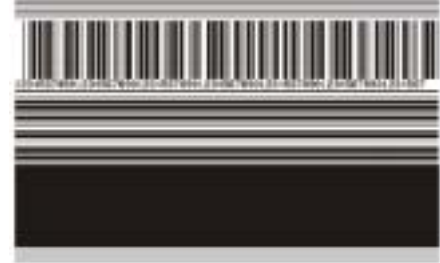
PRINTER CONFIGURATION	
Zebra Technologies ZTC Z4Mplus - 200dpi	
+14.....	DARKNESS
2 IPS.....	PRINT SPEED
+000.....	TEAR OFF
TEAR OFF.....	PRINT MODE
CONTINUOUS.....	MEDIA TYPE
WEB.....	SENSOR TYPE
AUTO SELECT.....	SENSOR SELECT
THERMAL-TRANS.....	PRINT METHOD
104 0/8 MM.....	PRINT WIDTH
1300.....	LABEL LENGTH
39.01N 988MM.....	MAXIMUM LENGTH
BIDIRECTIONAL.....	PARALLEL COMM.
RS232.....	SERIAL COMM.
57600.....	BAUD
8 BITS.....	DATA BITS
NONE.....	PARITY
XON/XOFF.....	HOST HANDSHAKE
NONE.....	PROTOCOL
000.....	NETWORK ID
NORMAL MODE.....	COMMUNICATIONS
<~> 7EH.....	CONTROL PREFIX
<^> 5EH.....	FORMAT PREFIX
<.> 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
CALIBRATION.....	MEDIA POWER UP
CALIBRATION.....	HEAD CLOSE
DEFAULT.....	BACKFEED
+000.....	LABEL TOP
+0000.....	LEFT POSITION
072.....	WEB S.
072.....	MEDIA S.
073.....	RIBBON S.
066.....	TAKE LABEL
007.....	MEDIA LED
000.....	RIBBON LED
+10.....	LCD ADJUST
DPSWFXM.....	MODES ENABLED
832 8/MM FULL.....	MODES DISABLED
V44.12.4 <-.....	RESOLUTION
V23.0.0.54.....	FIRMWARE ID
CUSTOMIZED.....	HARDWARE ID
NONE.....A:	CONFIGURATION
3584k.....R:	COMPACT FLASH
NONE.....B:	RAM
0512k.....E:	MEMORY CARD
NONE.....	ONBOARD FLASH
000 DISPLAY.....	FORMAT CONVERT
VALUE PEEL REWIND.....	P30 INTERFACE
FW VERSION.....	OPTION
01/13/97.....	IDLE DISPLAY
07:13.....	RTC DATE
NONE.....	RTC TIME
	ZEBRA NET II

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The configuration may be changed either temporarily (for specific label formats or ribbon and label stock) or permanently (by saving the new parameters in memory). See [page 22](#) for further information about the configuration procedure.

Pause Self Test

This self test can be used to provide the test labels required when making adjustments to the printer's mechanical assemblies. See the sample printout at right.



Perform the following procedure to complete the Pause Self Test:

1. Turn the printer Off (O).
2. Press and hold **PAUSE** while turning the printer On (I).
3. Release **PAUSE** after the DATA light turns off (approximately five seconds).
 - The initial self test prints 15 labels at 2 in. (51 mm) per second, then automatically pauses the printer. When **PAUSE** is pressed, an additional 15 labels print.
 - Pressing **CANCEL** while the printer is paused alters the self test. When **PAUSE** is pressed, the printer prints 15 labels at 6 in. (152 mm) per second.
 - Pressing **CANCEL** again while the printer is paused alters the self test again. When **PAUSE** is pressed, the printer prints 50 labels at 2 in. (51 mm) per second.
 - Pressing **CANCEL** again while the printer is paused alters the self test a third time. When **PAUSE** is pressed, the printer prints 50 labels at 6 in. (152 mm) per second.
 - Pressing **CANCEL** again while the printer is paused alters the self test a fourth time. When **PAUSE** is pressed, the printer prints 15 labels at the printer's maximum speed.
 - To exit this self test at any time, press and hold **CANCEL**.

Feed Self Test

See the illustration at right.

Perform the following procedure to complete the Feed Self Test:

1. Turn the printer Off (O).
2. Press and hold **FEED** while turning the printer On (I).
3. Release **FEED** after the DATA light turns off (approximately five seconds).

Feed Self Test prints out at various darkness settings above and below that of the darkness value shown on the configuration label. Examine these labels and determine which one has the best darkness setting for your application. This value can be entered into the printer by setting the darkness during the configuration procedure. See [page 22](#) for more information.

The value printed on that label is added to (plus) or subtracted from (minus) the darkness value specified on the configuration label. The resulting numeric value (0 to 30) is the best darkness value for that specific media and ribbon combination.

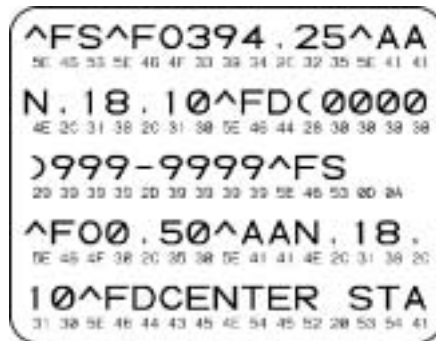


Communications Diagnostics Test

This test is controlled from the front panel display. See [page 75](#). A typical printout from this test is shown in below. Turn the printer Off (O) to exit this self test.



Note • This label is inverted when printed (prints upside down).



Loading Factory Defaults

Perform the following procedure to load the factory defaults:

1. Press **SETUP/EXIT** two times.
2. Use **PLUS (+)** or **MINUS (-)** to scroll through the SAVE CHANGES choices.
3. When **LOAD DEFAULTS** displays, press **SETUP/EXIT**.

CHAPTER 8

Specifications

This chapter contains all needed specifications on the Z4Mplus and Z6Mplus printers.

Contents

General Specifications	114
Printing Specifications	115
Media Specifications	116
Ribbon Specifications	118
Options	119
Zebra Programming Language (ZPL II)	120
Bar codes	121
AC Power Cord	122
Power Line Cord Specifications	122

General Specifications

General Specifications		Z4Mplus		Z6Mplus	
Height		13.3 in.	338 mm	13.3 in.	338 mm
Width		10.9 in.	277 mm	13.4 in.	341 mm
Depth		18.7 in.	475 mm	18.7 in.	475 mm
Weight (without options)		32.4 lbs.	14.7 kg	34.7 lbs.	16 kg
Electrical		90-265 VAC, 48-62 Hz, 5 Amps (fused)		90-265 VAC, 48-62 Hz, 5 Amps (fused)	
Agency Approvals		UL 1950, CISPR 22 (class B), CSA 22.2 No. 950-95, IEC60950, EN60950, EN500824, EN55022 (class B), EN55024, EN61000-3-2, -3-3. Complies with FCC Class B and Canadian Doc Class A rules. Carries the CE mark of compliance. Product markings: cULus, CE Marking, FCC-B, ICES-003, VCCI, C-Tick, NOM, IRAM, CCC, GOST-R, BSMI.			
Temperature	Operating	40° to 104°F	5° to 40°C	40° to 104°F	5° to 40° C
	Storage	-40° to 140°F	-40° to 60°C	-40° to 140°F	-40° to 60°C
Relative Humidity	Operating	20% to 85%, non-condensing		20% to 85%, non-condensing	
	Storage	5% to 85%, non-condensing		5% to 85%, non-condensing	
Communication Interface		RS-232/CCITT V.24 serial data interface; 110 to 115000 baud, parity, bits/character, 7 or 8 data bit, and XON-XOFF, RTS/CTS or DTR/DSR handshake protocol required. 750mA at 5 V from pin 9. 8-bit parallel data interface; supports IEEE 1284 bi-directional parallel, ECP and nibble mode compliant. Error detection CRC protocol.			

Printing Specifications

Printing Specifications		Z4Mplus		Z6Mplus	
Print resolution		203 dots/inch	8 dots/mm	203 dots/inch	8 dots/mm
		300 dots/inch	12 dots/mm	300 dots/inch	12 dots/mm
Dot size (width x length)	203 dpi	0.00492 in. x 0.00492 in.	0.125 mm x 0.125 mm	0.00492 in. x 0.00492 in.	0.125 mm x 0.125 mm
	300 dpi	0.0033 in. x 0.0039 in.	0.084 mm x 0.099 mm	0.0033 in. x 0.0039 in.	0.084 mm x 0.099 mm
Maximum print width	203 dpi	4.09 in.	104 mm	6.6 in.	168 mm
	300 dpi	4.1 in.	106 mm		
Minimum print length		1 dot row		1 dot row	
Maximum print length	203 dots/ inch	105 in.	2667 mm	65 in.	1651 mm
	300 dots/ inch	45 in.	1143 mm	29 in.	737 mm
Bar code modulus	203 dots/ inch	5 mil to 50 mil		5 mil to 50 mil	
(X) dimension	300 dots/ inch	3.3 mil to 33 mil		3.3 mil to 33 mil	
Programmable constant print speeds	203 dots/ inch	Per second: 7 in., 8 in., 9 in., 10 in.	Per second: 178 mm, 203 mm, 229 mm, 254 mm	Per second: 7 in., 8 in., 9 in., 10 in.	Per second: 178 mm, 203 mm, 229 mm, 254 mm
	300 dots/ inch	Per second: 2 in., 3 in., 4 in., 5 in., 6 in.	Per second: 51 mm, 76 mm, 102 mm, 127 mm, 152 mm	Per second: 2 in., 3 in., 4 in., 5 in., 6 in.	Per second: 51 mm, 76 mm, 102 mm, 127 mm, 152 mm

Thin film printhead with energy control

Media Specifications

Media Specifications			Z4Mplus		Z6Mplus	
Label length	Minimum	Tear-off	0.5 in.	13 mm	0.5 in.	13 mm
		Peel-off	1 in.	25.4 mm	1 in.	25.4 mm
	Maximum	Rewind	0.5 in.	13 mm	0.5 in.	13 mm
		Cutter	1 in.	25.4 mm	1.5 in.	38.1 mm
			39 in.	991 mm	39 in.	991 mm
Label width	Minimum		1 in.	25.4 mm	2 in.	51 mm
	Maximum	Tear/Cutter	4.5 in.	114 mm	7.0 in.	178 mm
		Peel/ Rewind	4.25 in.	108 mm	6.75 in.	171 mm
Total thickness (includes liner, if any)	Minimum		0.0023 in.	0.058 mm	0.0023 in.	0.058 mm
	Maximum		0.010 in.	0.25 mm	0.010 in.	0.25 mm
Core size			3 in.	76 mm	3 in.	76 mm
Maximum roll diameter			8 in.	203 mm	8 in.	203 mm
Inter-label gap	Minimum		0.079 in.	2 mm	0.079 in.	2 mm
	Preferred		0.118 in.	3 mm	0.118 in.	3 mm
	Maximum		0.157 in.	4 mm	0.157 in.	4 mm
Ticket/tag notch size (width x length)			0.236 in. × 0.12 in.	6 mm × 3 mm	0.236 in. × 0.12 in.	6 mm × 3 mm
Hole diameter			0.125 in.	3 mm	0.125 in.	3 mm
Notch or hole position (Centered from inner media edge)	Minimum		0.15 in.	3.8 mm	0.15 in.	3.8
	Maximum		2.25 in.	57 mm	3.5 in.	90 mm

Media Specifications		Z4Mplus		Z6Mplus	
Black mark dimensions	Vertical length	0.98 in. to 0.453 in.	2.5 to 11.5 mm	0.98 in. to 0.453 in.	2.5 to 11.5 mm
	Horizontal width	> 0.37 in.	≥ 9.5 mm	≥ 0.37 in.	≥ 9.5 mm
	Location	within 0.40 in. (1 mm) of inside media edge			
		May also be centered from 0.23 in. to 2.25 in. from the media inner edge	May also be centered from 5.84 mm to 57 mm from the media inner edge	May also be centered from 0.23 in. to 3.5 in. from the media inner edge	May also be centered from 5.84 mm to 90 mm from the media inner edge
	Density, in Optical Density Units (UDO)	> 1.0 ODU			
	Maximum media density	≤ 0.5 ODU			
Transmissive Sensor	Fixed	7/16 in. (11 mm) from inside edge			

Ribbon Specifications

Ribbon Specifications		Z4Mplus		Z6Mplus	
Ribbon must be wound with the coated side out					
Ribbon width <small>(Zebra recommends using ribbon at least as wide as the media to protect the printhead from wear.)</small>	Minimum	>1 in.	25.4 mm	>2 in.	60 mm
	Maximum	4.3 in.	109 mm	6.9 in.	174 mm
Standard lengths	2:1 media to ribbon roll ratio	984 ft.	300 m	984 ft.	300 m
	3:1 media to ribbon roll ratio	1476 ft.	450 m	1476 ft.	450 m
Ribbon core inside diameter		1 in.	25.4 mm	1 in.	25.4 mm

Options

Z4Mplus	Z6Mplus
<ul style="list-style-type: none"> • Cutter • Peel-off • Liner take-up • PCMCIA card socket (supports Zebra Rapid Flash and ATA formats) • Linear Memory Card (Zebra Rapid Flash) 8MB and 32MB • Compact Flash 32MB, 64MB, 128MB, and 256MB • 300 dpi printhead • Rewind • Adjustable transmissive sensor • External PrintServer • Internal PrintServer 	<ul style="list-style-type: none"> • Cutter • Peel-off • Not Available • PCMCIA card socket (supports Zebra Rapid Flash and ATA formats) • Linear Memory Card (Zebra Rapid Flash) 8MB and 32MB • Compact Flash 32MB, 64MB, 128MB, and 256MB • 300 dpi printhead • Rewind • Not Available • External PrintServer • Internal PrintServer

Zebra Programming Language (ZPL II)

Z4M/Z6Mplus ZPL II Features

- Downloadable graphics (with data compression)
 - Bit image data transfer and printing, mixed text/graphics
 - Format inversion
 - Mirror image printing
 - Four-position field rotation (0°, 90°, 180°, 270°)
 - Slew command
 - Programmable quantity with print pause
 - Communicates in printable ASCII characters
 - Controlled via mainframe, mini, PC, portable data terminal
 - In-Spec OCR-A and OCR-B
 - UPC/EAN (nominal 100% magnification 6 dots/mm printheads only)
 - Serialized fields
-

Bar codes

Z4M/Z6Mplus Bar Code Features

Code 11	LOGMARS
Code 39 (supports ratios of 2:1 to 3:1)	Plessey
Code 49 (2-dimensional bar code)	EAN-8, EAN-13, EAN EXTENSIONS
Code 93	UPC-A, UPC-E, UPC EXTENSIONS
Code 128 (supports serialization in all subsets and UCC case codes)	MSI
Codabar (supports ratios of 2:1 to 3:1)	PDF-417 (2-dimensional bar code)
Codablock	Micro-PDF-417
Interleaved 2 of 5 (supports ratios of 2:1 to 3:1; modulus 10 check digit)	POSTNET
Industrial 2 of 5	MaxiCode
Standard 2 of 5	Datamatrix
QR Code	Check digit calculation where applicable

AC Power Cord



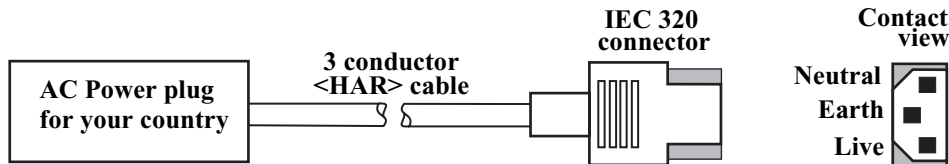
Caution • For personnel and equipment safety, always use a three-prong plug with an earth ground connection to the AC power source.

Power Line Cord Specifications

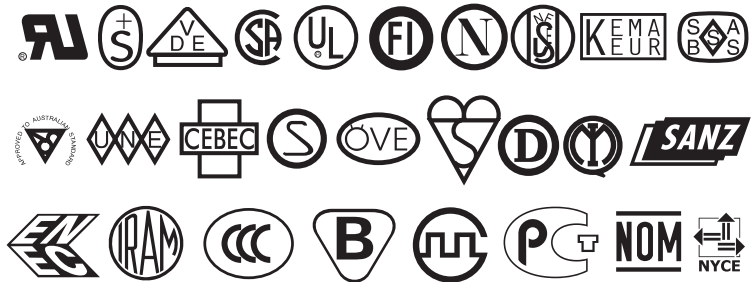


Note • Since many areas of the world have specific power requirements, an AC power cord may not be included with your printer. The power cord **must** meet your local electrical requirements.

- The overall length must be less than 9.8 ft. (3.0 m).
- It must be rated for at least 5A, 250 VAC.
- The chassis ground (earth) **MUST** be connected to ensure safety and reduce electromagnetic interference. The ground connection is handled by the third wire (earth) in the power cord as shown below.



- The AC power plug and IEC 320 connector must bear the certification mark of at least one of the known international safety organizations shown below.



APPENDIX A

DB-9 Connectors

This appendix discusses the Serial Port connections and adaptors.

Content

Printer Interface Technical Information	124
Serial Data Communications	124
Cable Specifications	124

Printer Interface Technical Information

Serial Data Communications

Hardware Control Signal Descriptions

For all RS-232 input and output signals, the Z4Mplus and Z6Mplus printers follow both the Electronics Industries Association (EIA) RS-232 and the Consultative Committee for International Telegraph and Telephone (CCITT) V.24 standard signal level specifications.

When DTR/DSR handshaking is selected, the Data Terminal Ready (DTR) control signal output from the printer controls when the host computer may send data. DTR ACTIVE (positive voltage) permits the host to send data. When the printer places DTR in the INACTIVE (negative voltage) state, the host must not send data.



Note • When XON/XOFF handshaking is selected, data flow is controlled by the ASCII Control Codes DC1 (XON) and DC3 (XOFF). The DTR Control lead has no effect.

Request to send (RTS) is a control signal from the printer that is connected to the clear to send (CTS) input at the host computer. RTS is always active (positive voltage) when the printer is on.

Cable Specifications

RS-232 Serial Data Port

The connection for this standard interface is made through the female DB-9 connector on the rear panel. A DB-9 to DB-25 interface module is required for all RS-232 connections through a DB-25 cable (see [page 128](#) for details).

For all RS-232 input and output signals, the printer follows both the Electronics Industries Association's (EIA) RS-232 specifications and the Consultative Committee for International Telegraph and Telephone (CCITT) V.24 standard signal level specifications.

The Table below shows the pin configuration and function of the rear panel serial data connector on the printer.

Pin Number	Name	Description
1	—	Not connected
2	RXD	Receive data—data input to printer
3	TXD	Transmit data—data output from printer
4	DTR	Data terminal ready—output from printer
5	SG	Signal ground
6	DSR	Data set ready—input to printer
7	RTS	Request to send—output from printer
8	CTS	Clear to send—input to printer
*9	+5 V DC	+5 VDC

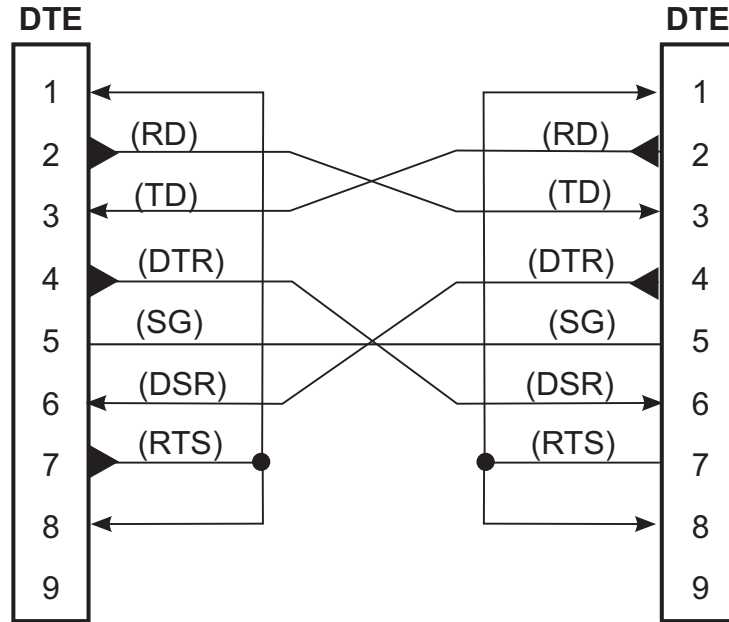
Note • * This pin is also available as a +5 VDC power source at 750 mA. To enable this capability, a jumper on the computer's main logic board needs to be installed on JP1, pins 2 and 3.



Note • An interface module is required for RS-422/RS-485 interface support (refer to [page 129](#)).

RS-232 Interface Connections

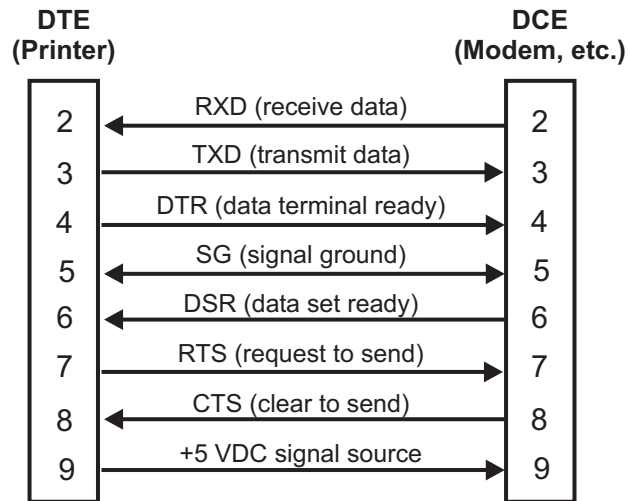
The printer is configured as Data Terminal Equipment (DTE). The illustration below shows the internal connections of the printer's RS-232 connector.



Note • The cable used to connect the printer to a computer must be a null modem (crossover) cable. If you want to connect the printer to any other DTE devices, a null modem cable must also be used.



When the printer is connected via its RS-232 interface to Data Communication Equipment (DCE) such as a modem, use a standard RS-232 (straight-through) interface cable. Figure 45 illustrates the connections required for this cable.



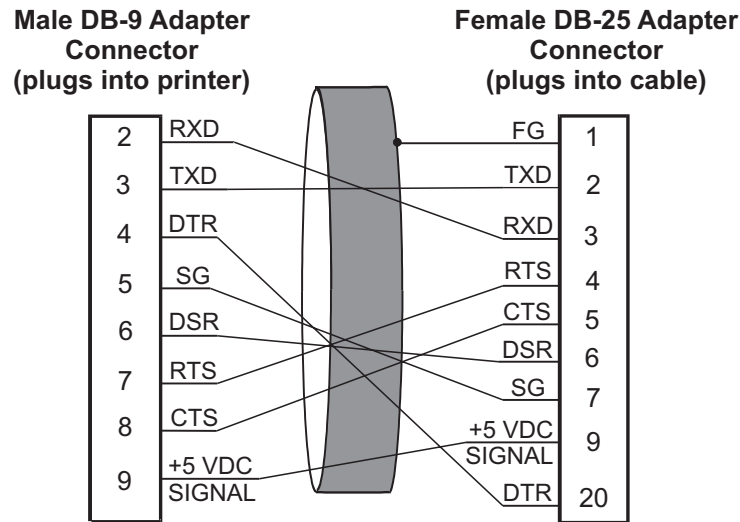
NOTE • Pin 1 is unused and unterminated at the printer.

RS-232 Interconnections Using a DB-25 Cable

To connect the printer's RS-232 DB-9 interface to a DB-25 connector, an interface adapter is required (Zebra part number 33138). A generic DB-25 adapter may also be used, however, the +5 VDC signal source would not be passed through. The illustration below shows the connections required for the DB-9 to DB-25 interface.



Note • The cable used to connect the printer to a computer must be a null modem (crossover) cable. If you want to connect the printer to any other DTE devices, you must also use a null modem cable.



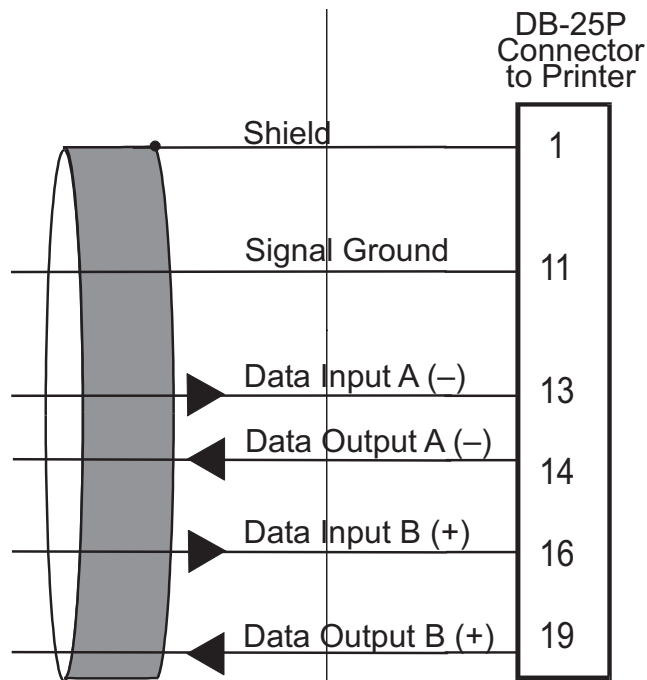
Note • Pin 1 of DB-9 connector is unused and unterminated.

RS-422/RS-485 Interconnections



Note • A jumper on the computer’s main logic board needs to be installed on JP1, Pins 2 and 3, for the RS-422/RS-485 interface adapter to function properly.

To connect the printer’s RS-232 DB-9 interface to a host computer through an RS-422 or an RS-485 interface, an interface adapter is required (Zebra part number 33130). The illustration below shows the required cable wiring for interconnecting to the interface adapter’s DB-25 female connector.





APPENDIX B

Parallel Data Port

This appendix discusses the parallel data port and connections.

Contents

Parallel Data Port	132
Parallel Interface	132
Parallel Port Interconnections	132

Parallel Data Port

Parallel Interface

The 8-bit parallel data interface supports IEEE 1284 bi-directional parallel communications in nibble mode. The parallel interface provides a means of communication that is typically faster than the previously mentioned serial interface methods. In this method, the bits of data that make up a character are sent all at one time over several wires in the cable, one bit per wire.

Parallel Cabling Requirements

An IEEE-1284 compatible bi-directional parallel data cable is required when this communication method is used. The required cable must have a standard 36-pin parallel connector on one end that is plugged into the mating connector located at the rear of the printer. The other end of the cable connects to the printer connector at the host computer. Port selection for status information is determined each time the printer is turned on.

Parallel Port Interconnections

The table below shows the pin configuration and function of a standard computer-to-printer parallel cable.



36-Pin Connectors	Description
1	nStrobe/HostClk
2 to 9	Data Bits 1 to 8
10	nACK/PtrClk
11	Busy/PtrBusy
12	PError/ACKDataReq
13	Select/Xflag
14	nAutoFd/HostBusy
15	Not used
16 and 17	Ground
18	+5V @ 750 mA The maximum current draw may be limited by option configuration.
19 to 30	Ground
31	nInit
32	nFault/NDataAvail
33 and 34	Not used
35	+5V through a 1.8K Ω Resistor
36	NSelectin/1284 active



APPENDIX C

Memory Cards

This appendix discusses the field available memory cards and their installation.

Contents

Memory Cards.....	136
PCMCIA Card	136

Memory Cards

PCMCIA Card

See the instructions below to install the Type I or Type II compliant PCMCIA card:



Caution • The printer electronics are susceptible to static discharge. Use a properly grounded wrist strap while working on the printer.



Note • The PCMCIA card is hot-swappable, it can be installed while the printer is On (I).

Install the PCMCIA Card

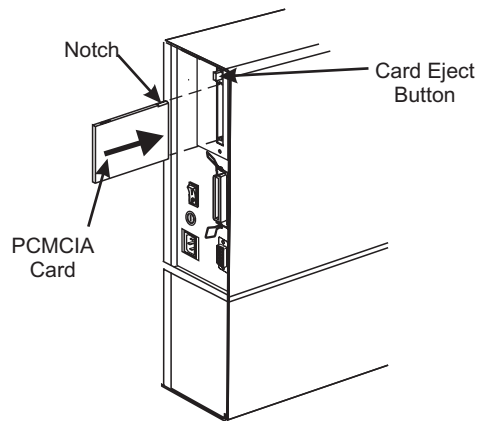
Refer to illustration on next page.

1. Remove the PCMCIA card shield from the rear of the printer.
2. Insert the PCMCIA card, with the notch UP, into the card slot as shown. Insert far enough to cause the eject button to pop out.
3. Reinstall the PCMCIA card shield over the PCMCIA card and card slot.

The printer is now ready to operate with the additional memory or font option.



Note • Initialization of the PCMCIA card may take a few minutes; the Pause LED flashes while the card initializes. If the card is already initialized, the Pause LED flashes only once or twice. To verify that the card has successfully initialized, print a configuration label and review it to see if the new memory card information is listed.





APPENDIX D

Extend Printhead Life

This appendix discusses the processes needed to extend the life of the printhead.

Content

Extend the Life of Your Printhead with Save-a-Printhead Cleaning Film	140
Recommended for all Zebra printers	140
Use Save-a-Printhead Cleaning Film	143
How to Order Cleaning Film Kits	144



Extend Printhead Life

Extend the Life of Your Printhead with Save-a-Printhead Cleaning Film

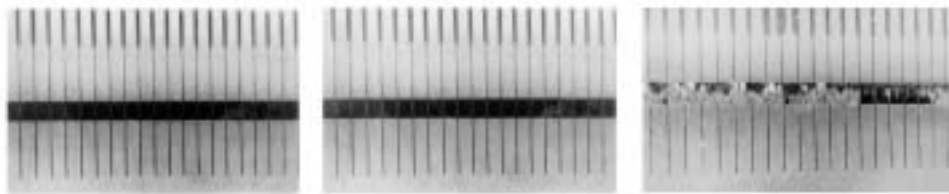
Extend the Life of Your Printhead with Save-a-Printhead Cleaning Film

Recommended for all Zebra printers

Challenge

The printhead is the most critical component in your printer, and possibly the most delicate. It is a consumable item, just like the brakes on your car, that eventually wears over time. However, with ongoing careful attention and maintenance, you can **extend the life of the printhead**.

Below are photographs of three printheads. The first printhead is brand new. The second has printed over 1 million linear inches of thermal transfer labels and has been properly maintained. The third printhead has printed far fewer labels, but without proper care and maintenance, signs of abrasion and contamination buildup are evident.



New

Over 1 Million Inches
(Properly Maintained)

Less than 1 Million Inches
(Without Proper Care)

Preventive Maintenance

For optimum performance, clean the printhead regularly. Take care when handling or cleaning the printhead by removing any jewelry that may scratch it, and use a grounding strap or anti-static mat to discharge static electricity that could damage the printhead.

For 200 and 300 dpi printers: Clean after every roll (1500 feet or 450 m) of thermal transfer ribbon or after every roll (500 feet or 150 m) of direct thermal labels.

To start, use only the presoaked (isopropyl alcohol) cleaning swabs provided in the preventive maintenance kit (Zebra part number 47362). Open the media cover to access the printhead, then open the printhead. Lightly blow or brush away any loose dust and lint particles within the print mechanism (such as rollers, media or ribbon sensors, and printhead). Never use any hard, metallic, or abrasive objects—such as a screwdriver—to remove adhesives or other contaminants that may have built up on the printhead. Next, press the swab tip against the printhead and swipe the print elements from end to end. Finally, turn the platen rollers while wiping them from side to side. Repeat this last step until the swab no longer shows dirt.

Avoid the Contributing Factors to Premature Printhead Failure

Abrasion: Over time, the movement of media and ribbon across the printhead wears through the protective ceramic coating, exposing and eventually damaging the print elements (dots).

To avoid abrasion:

- Clean your printhead frequently and use well-lubricated thermal transfer ribbons with backcoatings optimized to reduce friction.
- Minimize printhead pressure and burn temperature settings by optimizing the balance between the two.
- Ensure that the thermal transfer ribbon is as wide as or wider than the label media to prevent exposing the elements to the more abrasive label material.

Extend Printhead Life

Extend the Life of Your Printhead with Save-a-Printhead Cleaning Film

Ribbon Backcoating and Buildup: Printhead contamination from direct thermal labels or thermal transfer ribbon may occur in applications requiring high burn settings, high head pressure, high speed, or high volume. This contamination builds up on the printhead elements, creating a barrier to the heat transformation required to produce high-quality images. Contaminant buildup occurs gradually and results in poor print quality that may look like faded print or a failed print element. This buildup resists cleaning with presoaked swabs and can be difficult to remove. Follow the recommendations below to avoid contamination buildup on the printhead.

To avoid ribbon backcoating and buildup:

- Use thermal transfer ribbons that have been specially cured to provide backcoat protection for high-demand applications. These ribbons (sometimes referred to as anti-stick ribbons) also dissipate static and provide more lubrication.
- Follow the recommended Printhead Preventive Maintenance procedures.
- Use Zebra's *Save-a-Printhead* cleaning film to remove printhead contamination buildup quickly and easily.

***Save-a-Printhead* Cleaning Film**

Save-a-Printhead cleaning film is a specially coated film that removes contamination buildup without damaging the printhead. *Save-a-Printhead* cleaning film extends the life of your printhead, reduces maintenance downtime and the cost of replacing a printhead, and is an inexpensive, easy, and quick way to remove contaminants without removing the printhead.

Use *Save-a-Printhead* cleaning film when you see degrading print quality that looks like faded print or a failed print element that cannot be corrected by cleaning with the presoaked cleaning swabs.

For 200 and 300 dpi printers: Clean after every roll (1500 feet or 450 m) of thermal transfer ribbon or after every roll (500 feet or 150 m) of direct thermal labels or when CLEAN HEAD NOW appears on the liquid crystal display (LCD).

Use *Save-a-Printhead* Cleaning Film



Caution • An improperly seated printhead data cable or power cable could result in the printhead generating excessive heat that could cause harm if it is touched.

1. Open the media cover.
2. Open the printhead, remove labels and ribbon from the print mechanism.
3. Clean the printhead per recommended preventive maintenance procedures.
4. Position the *Save-a-Printhead* film in the print path, placing the glossy side down away from the printhead (matte side up).
5. Close and latch the printhead.
6. Slowly pull the full length of the film through the print mechanism.
7. Clean the printhead a second time per recommended preventive maintenance procedures.
8. Reload labels and ribbon, close and latch the printhead.
9. Close the media cover.

Print labels and inspect for improved print quality. If quality has not improved, contact Zebra's Technical Support staff at **1.847.913.2259** or visit our Web site: www.zebra.com.

Only one pass of *Save-a-Printhead* film is required to remove contamination buildup, and each strip of film can be used up to 10 times. Discard the strip when residue buildup or other contamination is apparent.

If a replacement printhead is needed, Zebra strongly recommends using a product from the Original Equipment Manufacturer (OEM) to ensure that your printer and part warranties remain intact and that the product performs optimally.

Extend Printhead Life

Extend the Life of Your Printhead with Save-a-Printhead Cleaning Film

How to Order Cleaning Film Kits

There are five kits to accommodate printers with different print widths. Each kit contains three 10 in. (254 mm) long strips of film. Reference the following table to order the appropriate kit for your printer:

Order kit number:	For Printers with Print Widths of:
46902	3.0–4.0 in. (76–102 mm)
44902	4.0–5.0 in. (102–127 mm)
48902	5.0–6.0 in. (127–152 mm)
38902	6.0–7.0 in. (152–178 mm)
22902	8.0–9.0 in. (178–229 mm)

Index

A

About this Document xxvii
AC Power Cord Specifications, 122
Adjustments
 Printhead Pressure, 16
 Reflective Sensor, 26
Auto Calibration, 28

B

Bar Codes, 121

C

Cabling Requirements, 32
Calibrating the Printer, 7
Cleaning
 Cutter Module, 93
 Power Peel/Rewind Module, 90
 Printhead and Platen Roller, 87
 Save-a-Printhead Cleaning Film 140–144
Communication Problems, 106
Communications Diagnostics Test, 112
Configuration
 Changing Password-Protected
 Parameters, 59
 Configuration and Calibration Sequence, 61
 Entering the Setup Mode, 58
 Leaving the Setup Mode, 60

Printer Driver Software, 28
Printer, 28
Contacts xxvi
Continuous Media, 11
Cutter Mode, 40

D

Damage, 2
Data Communications
 Parallel, 132
 Serial, 124
Data Ports
 Parallel, 132
 Serial, 124–129
Document Conventions xxviii

F

Factory Defaults, 112
Fanfold Media Loading, 52
Front Panel
 Display, 34
 Keys, 36
 Lights, 37
Fuse Replacement, 95

G

General Specifications, 114

H

Hardware Control Signal Descriptions, 124

I

Interconnections
 Parallel Port, 132
 RS-232, 125–128
 RS-422, 129
 RS-485, 129
 Interfaces
 Parallel, 132
 Printer, 124–132
 System, 30

L

LCD Error Conditions and Warnings, 98
 Liner Removal, 46, 49
 Liner Take-up Mode, 44
 Lubrication, 94

M

Media Loading
 Cutter Mode, 40
 Fanfold, 52
 Liner Take-up Mode, 44
 Tear-off Mode, 38
 Value Peel-off Mode, 42
 Media Removal, 52
 Media Specifications, 116
 Media Types
 Continuous Media, 11
 Non-Continuous Black Mark Media, 11
 Non-Continuous Web Media, 10
 Memory Card Installation
 PCMCIA Card, 136

N

Non-Continuous Black Mark Media, 11

P

Parallel Cabling Requirements, 132
 Parallel Data Port, 132
 Parallel Interface, 132
 Parallel Port Interconnections, 132
 Password-Protected Parameters, 59
 PAUSE Key Self Test, 110
 PCMCIA Card Installation, 136
 Port 132
 Positioning the Media Sensor
 Reflective Sensor, 26
 Transmissive Sensor, 28
 Power Cord Specifications, 122
 Power Peel/Rewind (Peel Mode), 46
 Print Mode, 12
 Print Quality Problems, 103
 Printer Calibration, 7
 Printer Diagnostics, 108
 Printer Interface Technical Information
 Hardware Control Signal Descriptions, 124
 Parallel Data Communications, 132
 Serial Data Communications, 124
 Printhead Pressure Adjustment, 16
 Printing Specifications, 115
 Proprietary Statement v

R

Reflective Sensor Adjustment, 26
 Reflective Sensor Positioning, 26
 Reporting Damage, 2
 Rewind Media Alignment, 18
 Ribbon Loading, 14, 54
 Ribbon Removal, 56
 Ribbon Specifications, 118
 Roll Media Loading, 38–52
 RS-232 serial data port, 124

S

- Save-a-Printhead Cleaning Film 142–144
- Self Tests
 - CANCEL Key, 109
 - Communications Diagnostics, 112
 - FEED Key, 111
 - PAUSE Key, 110
- Serial Data Communications, 124
- Serial Data Port, 124–129
- Specifications
 - AC Power Cord, 122
 - Bar Codes, 121
 - General, 114
 - Media, 116
 - Options, 118
 - Printing, 115
 - Zebra Programming Language (ZPL II), 120
- Storage, 2
- Support xxvi
- System Considerations
 - Interfaces, 30

T

- Tear-off Mode, 38
- Technical 124
- Transmissive Sensor Positioning, 28
- Types of Media
 - Continuous Media, 11
 - Non-continuous Black Mark Media, 11
 - Non-Continuous Web Media, 10

V

- Value Peel-off Mode, 42

Z

- Zebra Programming Language (ZPL II), 120

