



Zebra® *RXiIIIPlus™*
High-Performance Printer

User Guide



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Customer Order # 23063L-001

Manufacturer Part # 23063L-001 Rev. 1

DECLARATION OF CONFORMITY

I have determined that the Zebra printers identified as the

XiIIIPlus Series
90*XiIIIPlus*, 96*XiIIIPlus*, 110*XiIIIPlus*,
140*XiIIIPlus*, 170*XiIIIPlus*, 220*XiIIIPlus*

manufactured by:

Zebra Technologies
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This device complies with Part 15 rules. Operation is subject to the following two conditions:

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This equipment has been tested and found to comply with the limits for Class B Digital Devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the product manuals, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, the user is encouraged to do one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that any changes or modifications not expressly approved by Zebra Technologies could void the user's authority to operate the equipment. To ensure compliance, this printer must be used with Shielded Communication Cables.

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Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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Warranty Information



Effective December 30, 2002

All new Zebra products are warranted by the manufacturer to be free from defect in material and workmanship.

Printers and Related Hardware Products

Proof of purchase or shipment date is required to validate the warranty period. The warranty becomes void if the equipment is modified, improperly installed or used, damaged by accident or neglect, or if any parts are improperly installed or replaced by the user.

Products returned must be packaged in the original or comparable packing and shipping container. In the event equipment is not so packaged, or if shipping damage is evident, it will not be accepted for service under warranty. Surface transportation charges for return to customers in the continental United States is paid by Zebra. Otherwise, Zebra pays CPT (carriage paid to) nearest airport; customer pays customs, duties, taxes, and freight from airport to destination. If Zebra determines that the product returned for warranty service or replacement is not defective as herein defined, the customer will pay all handling and transportation costs.

Printers

All printers (excluding printheads) are warranted against defect in material or workmanship for twelve (12) months from the purchase date.

Printheads

Since printhead wear is part of normal operation, the original printhead is covered by a limited warranty as indicated below. Warranty period begins on purchase date.

Printhead	Warranty Period
Bar code label and receipt printer printheads	6 months
Plastic card printer printheads	12 months

To qualify for this warranty, the printhead must be returned to the factory or to an authorized service center. Customers are not required to purchase Genuine Zebra Supplies (media and/or ribbons) for warranty qualification.

However, if it is determined that the use of inappropriate or inferior supplies has caused any defect in the printhead for which a warranty claim is made, the user is responsible for Zebra's labor and material charges required to repair the defect. The warranty becomes void if the printhead is physically worn or damaged; also if it is determined that failure to follow the preventive maintenance schedule listed in the User Guide has caused defect in the thermal printhead for which a warranty claim is made.

Related Hardware Items

Products are warranted to be free of defects in material and workmanship from the date of purchase according to this chart:

Product	Warranty Period
Accessories	1 month
Batteries	3 months
Cables	1 month
Chargers/Power Supplies	1 year
Hardware Keys	1 year
Keyboard Display Units	6 months
Parts	3 months
Pocket Eye [®]	1 year
Software	1 month
ZebraNet [®] Print Servers	3 years

Defective product must be returned to Zebra for evaluation. In the event of notification of defect within the warranty period, Zebra will replace the defective item provided there had not been damage resulting from user abuse, modification, improper installation or use, or damage in shipping or by accident or neglect.

Supplies Products

Supplies are warranted to be free from defect in material and workmanship for a period of six (6) months for media and twelve (12) months for ribbon from the date of shipment by Zebra. This is provided the user has complied with storage guidelines, handling, and usage of the supplies in Zebra printers.

Zebra's sole obligation under these warranties is to furnish parts and labor for the repair or possible replacement of products found to be defective in material or workmanship during the warranty period. Zebra may in its discretion issue a credit for any such defective products in such amount as it deems reasonable.

Repair Services

Zebra repairs are warranted against defects in material and workmanship for 90 days from the date of repair by Zebra. This excludes printheads, which are warranted separately. This warranty does not cover normal wear and tear. This warranty becomes void if the item is modified, improperly installed or used, or damaged by accident, neglect, or abuse.

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Preface



This section provides you with contact information, document structure and organization, and additional reference documents.

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Note • The web address is case-sensitive.

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

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

Command Line Examples All command line examples appear in `Courier New` 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.

Cautions, Important, Note, and Example



Electrostatic Discharge Caution • Warns you of the potential for electrostatic discharge.



Electric Shock Caution • Warns you of a potential electric shock situation.



Caution • Warns you of a situation where excessive heat could cause a burn.



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

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



Important • Advises you of information that is essential to complete a task.



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



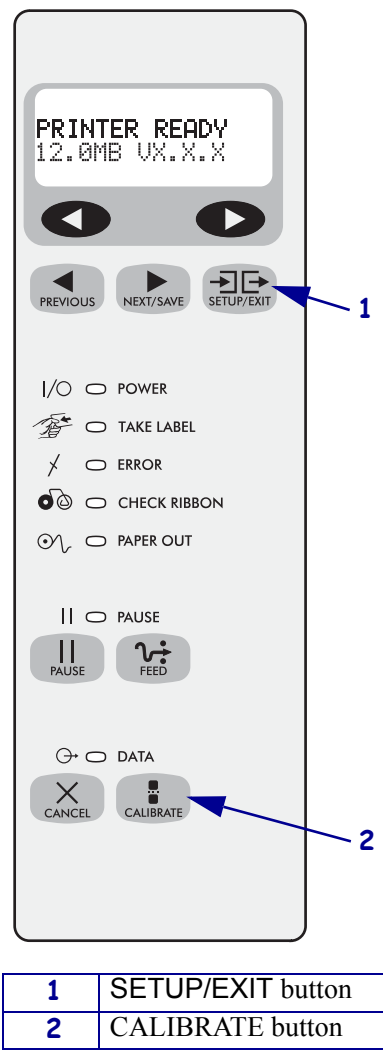
Example • Provides an example, often a scenario, to better clarify a section of text.



Tools • Tells you what tools you need to complete a given task.

Illustration Callouts Callouts are used when an illustration contains information that needs to be labeled and described. A table that contains the labels and descriptions follows the graphic. [Figure 1](#) provides an example.

Figure 1 • Sample Figure with Callouts



Related Documents

- The following documents might be helpful references:
- *ZPL II® Programming Guide Volume I* (part number 45541L) and *Volume II* (part number 45542L).
 - *ZebraNet® Wireless Print Server User Guide* (part number 13422L)
 - *ZebraNet 10/100 Print Server User and Reference Guide* (part number 47619L-001)
 - *ZebraNet PrintServer II™ Installation and User Guide* (part number 45537L)
 - *Maintenance Manual* (part number 48152L)



Introduction

This chapter provides a high-level overview of the printer and its components.

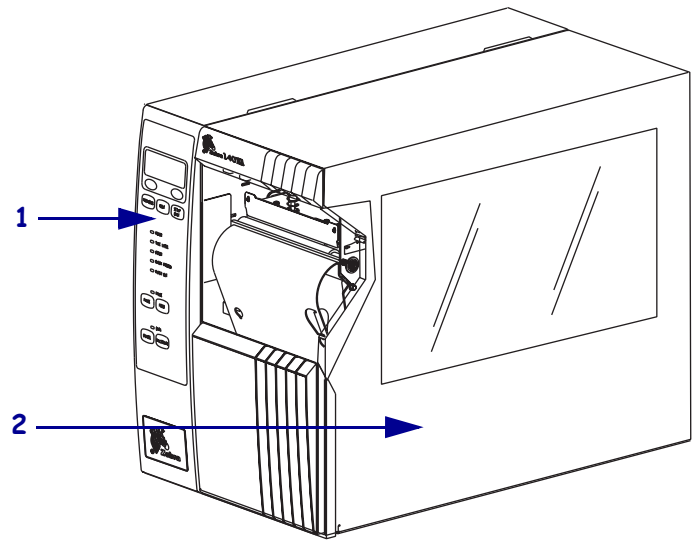
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Exterior View

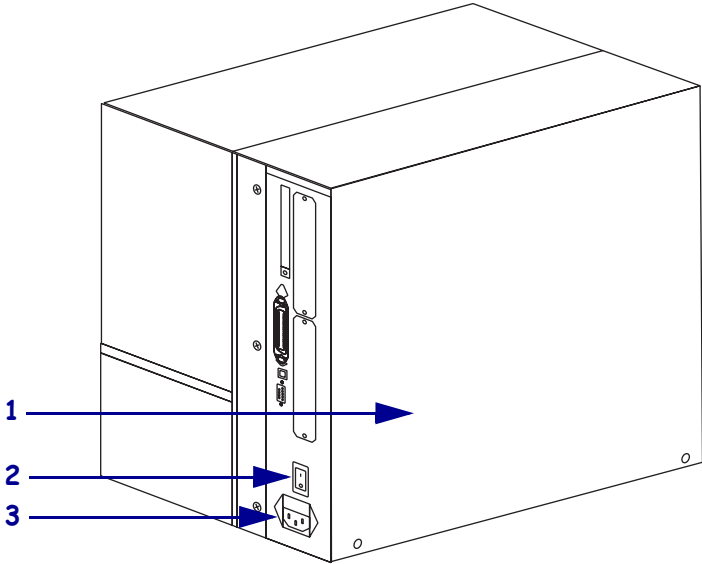
The following illustrations show the exterior of the printer.

Figure 2 • Printer Exterior—Front View



1	Front panel
2	Media door

Figure 3 • Printer Exterior—Rear View

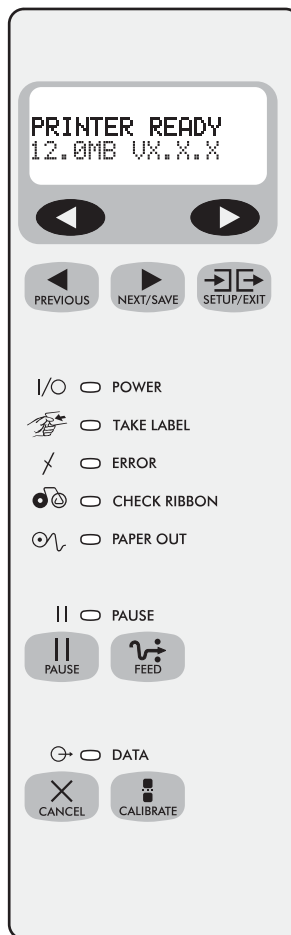


1	Electronics cover
2	Power switch
3	AC power cord connection

Front Panel

Figure 4 shows the buttons and lights on the front panel. For a description of the front panel buttons, see Table 1 on page 4, and for a description of the front panel lights, see Table 2 on page 5.

Figure 4 • Front Panel Buttons and Lights



Front Panel Buttons

This table describes the function of the buttons shown in [Figure 4](#).

Table 1 • Front Panel Buttons

Button	Details
LEFT OVAL 	Changes parameter values. Common uses are to increase/decrease a value, answer yes or no , indicate on or off , scroll through several choices, input the password, or set up the printer for a firmware download.
RIGHT OVAL 	Changes parameter values. Common uses are to increase/decrease a value, answer yes or no , indicate on or off , scroll through several choices, input the password, or set up the printer for a firmware download.
SETUP/EXIT 	Enters and exits the setup mode.
PREVIOUS 	While in setup mode, scrolls to the previous parameter. Press and hold this button to scroll back quickly through parameter sets.
NEXT/SAVE 	While in setup mode, scrolls to the next parameter. Press and hold this button to scroll forward quickly through parameter sets. When exiting setup mode, this button scrolls through the save options.
PAUSE 	Starts and stops the printing process and allows other buttons to be used. If an error messages is on the LCD, pressing this button after the problem is resolved clears the error and allows printing to resume.
FEED 	Forces the printer to feed a blank label each time the button is pressed. • If the printer is not printing, one blank label immediately feeds. • If the printer is printing, one blank label feeds after the current batch of labels is complete.
CANCEL 	In the pause mode, this button cancels print jobs. • If there are multiple print jobs in the print queue, press CANCEL once for each print job to be deleted. • To delete all print jobs, hold CANCEL for several seconds. The DATA light turns off.
CALIBRATE 	This button can be used to calibrate the printer for the following: • Media length • Media type (continuous or non-continuous) • Print mode (direct thermal or thermal transfer) • Sensor values For more information on calibration, see Calibrate the Printer on page 33.

Front Panel Lights

This table details the lights shown in [Figure 4 on page 3](#).

Table 2 • Front Panel Lights

Light	Details
POWER 	Indicates printer power status. • Off — printer is off. • On — printer is on.
TAKE LABEL 	• Off — Normal operation. • Flashing — (<i>Peel-Off Mode only.</i>) The label is available. Printing is paused until the label is removed.
ERROR 	Indicates printer operation. • Off — Normal operation. • Flashing — printer pauses until the error condition is resolved and the PAUSE button is pressed.
CHECK RIBBON 	• Off — Normal operation; ribbon (if used) is properly loaded. • On — No ribbon is detected under the ribbon sensor. Printing is paused, the LCD shows an error message, and the PAUSE light is on.
PAPER OUT 	Indicates that labels need to be reloaded.
PAUSE 	• Off — normal operation. • On — all printing operations have stopped. Either PAUSE was pressed, a pause command was included in the label format, the on-line verifier detected an error, or a printer error was detected.
DATA 	• Off — Normal operation. No data being received or processed. • On/Blinking — Data processing or printing is taking place. Data is being received.

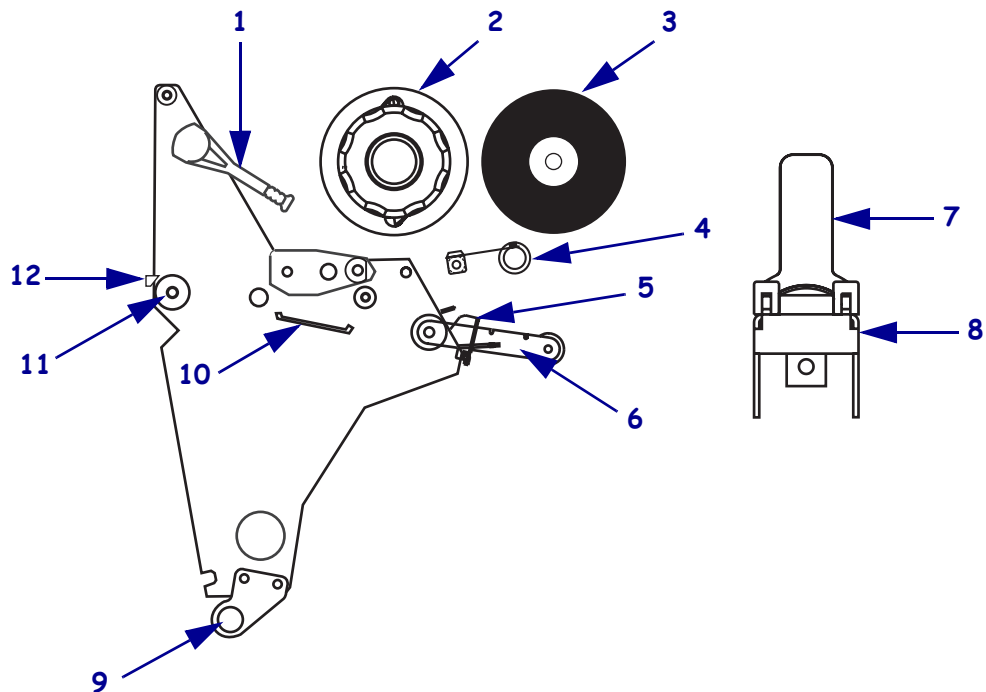
Printer Components

Figure 5 shows a side view of the printer's internal components.



Note • Depending on the printer options that you selected, your printer could look slightly different. For more about printer options, go to www.zebra.com.

Figure 5 • Internal Components



1	Printhead lever
2	Ribbon take-up spindle
3	Ribbon supply spindle
4	Ribbon dancer assembly (only on select models)
5	Media guide
6	Media dancer roller assembly
7	Media supply guide
8	Media supply hanger
9	Lower roller
10	Snap plate
11	Platen roller
12	Tear-off bar



Printer Setup

This chapter provides the tasks that you must complete and the issues that you must consider before you load and configure your printer.

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Before You Begin

Review this checklist, and resolve any issues before you begin setting up your printer. When you are ready, continue with [Printer Operation on page 21](#).

- ☐ **Unpack and Inspect** Have you unpacked the printer and inspected it for damage? If you have not, see [Unpack and Inspect the Printer on page 9](#).
- ☐ **Select a Site** Have you selected an appropriate location for the printer? If you have not, see [Select a Site for the Printer on page 10](#).
- ☐ **Attach Power Cord** Do you have the correct power cord for your printer? If you are unsure, see [Power Cord Specifications on page 11](#). To attach the power cord and connect the printer to a power source, see [Connect the Printer to a Power Source on page 11](#).
- ☐ **Connect to a Data Source** Have you determined how the printer will be connected to a data source (usually a computer)? For more information, see [Select a Communication Interface on page 12](#).
- ☐ **Select Media** Do you have the correct media for your application? If you are unsure, see [Types of Media on page 14](#).
- ☐ **Select Ribbon** Do you need to use ribbon, and is the appropriate ribbon available, if needed? If you are unsure, see [Ribbon on page 17](#).

Unpack and Inspect the Printer

When you unpack the printer, save all packing materials. When the printer is out of the box, raise the printer's media door, and remove the power cord.

Inspect the printer for possible damage incurred during shipment. Check all exterior surfaces for damage. Raise the media door, and inspect the media compartment for damage to components.

Report Shipping Damage

If you discover shipping damage upon inspection:

- Immediately notify the shipping company of the damage, and file a damage report with them. Zebra is not responsible for any damage incurred during shipment of the equipment and does not repair this damage under warranty.
- Keep all packaging material for shipping company inspection.
- Notify your authorized Zebra reseller.

Store or Reship the Printer

If you are not placing the printer into immediate operation, repackage it using the original packing materials. You may store the printer under the following conditions:

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

If you must ship the printer, remove any ribbon and media from the supply spools to avoid damaging the printer. Carefully pack the printer into the original container or a suitable alternate container to avoid damage during transit.

Select a Site for the Printer

Consider the following when selecting an appropriate location for your printer.

Select a Surface

Select a solid, level surface of sufficient size and strength to accommodate the printer and other equipment (such as a computer), if necessary. The choices include a table, countertop, desk, or cart.

Provide Proper Operating Conditions

Because the printer was designed and is fabricated as an industrial-type unit, it functions satisfactorily in a location that conforms to specified environmental and electrical conditions, including a warehouse or factory floor. For more information on the required conditions, see [General Specifications on page 117](#).

[Table 3](#) shows the temperature and relative humidity requirements for the printer when it is operating.

Table 3 • Operating Temperature and Humidity

Mode	Temperature	Relative Humidity
Thermal Transfer	41° to 104°F (5° to 40°C)	20 to 85% non-condensing
Direct Thermal	32° to 104°F (0° to 40°C)	20 to 85% non-condensing

Allow Proper Space

The printer should have enough space around it for you to be able to open the media door. To allow for proper ventilation and cooling, leave open space on all sides of the printer.

Caution • Do not place any padding or cushioning material behind or under the printer because this restricts air flow and could cause the printer to overheat.

Provide a Data Source

If the printer will be located away from the data source, the selected site must provide the appropriate connections to that data source. For more information on the types of communication interfaces, see [Select a Communication Interface on page 12](#).

Connect the Printer to a Power Source



Caution • For personnel and equipment safety, always use an approved three-conductor power cord specific to the region or country intended for installation. This cord must use an IEC 320 female connector and the appropriate region-specific three-conductor grounded plug configuration.

To connect the printer to a power source, complete these steps:

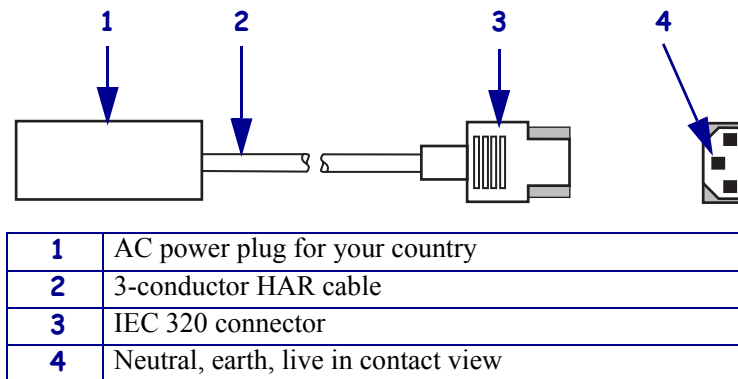
1. Turn the printer power switch (located on the rear of the printer) to the Off (O) position.
2. Plug the power cord into the mating connector on the rear of the printer.
3. Plug the other end of the power cord into the power source.

Power Cord Specifications

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, refer to the following guidelines:

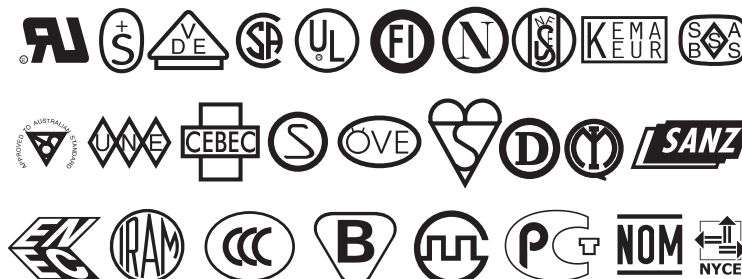
- The overall cord length must be less than 9.8 ft (3.0 m).
- The cord must be rated for at least 5 A, 250 V.
- The chassis ground (earth) **must** be connected to ensure safety and reduce electromagnetic interference. The third wire in the power cord grounds the connection (Figure 6).

Figure 6 • Power Cord Specifications



- The AC power plug and the IEC 320 connector must bear the certification mark of at least one of the known international safety organizations shown in Figure 7.

Figure 7 • International Safety Organization Marks



Select a Communication Interface

The way that you connect your printer to a data source depends on the communication options installed in the printer.

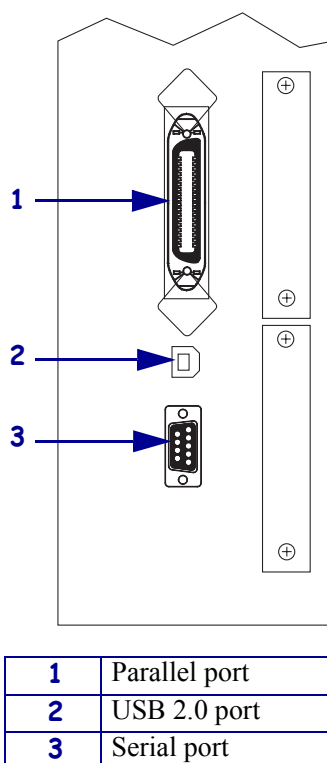
Standard interfaces: The standard communication interfaces are an RS-232 serial data port, a bidirectional parallel port, and a USB 2.0 port.



Note • RS-422 and RS-485 serial data ports are available through an adapter. A DB-25 cable and a USB 2.0 cable are also available.

Figure 8 shows the location of the communication interfaces on the back of the printer. For more information about these interfaces, see [Data Ports on page 73](#).

Figure 8 • Communication Interfaces



Optional Print Servers:

- ZebraNet Wireless Print Server. For more information on this option, see the *ZebraNet Wireless Print Server User Guide* (Zebra part number 13422L-001).
- ZebraNet 10/100 Print Server (10/100 PS). For more information on 10/100 PS, see the *ZebraNet 10/100 Print Server User and Reference Guide* (Zebra part number 47619L-001).
- ZebraNet PrintServer II (PSII). For more information on PSII, see the *PrintServer II User and Reference Guide* (Zebra part number 45537L).

Data Cable Requirements

Data cables must be fully shielded and fitted with metal or metallized 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 • Zebra printers comply with FCC Rules and Regulations, Part 15 for Class B Equipment using fully shielded, 6.5 ft (2 m) data cables. Use of unshielded cables may increase radiation above the Class B limits.

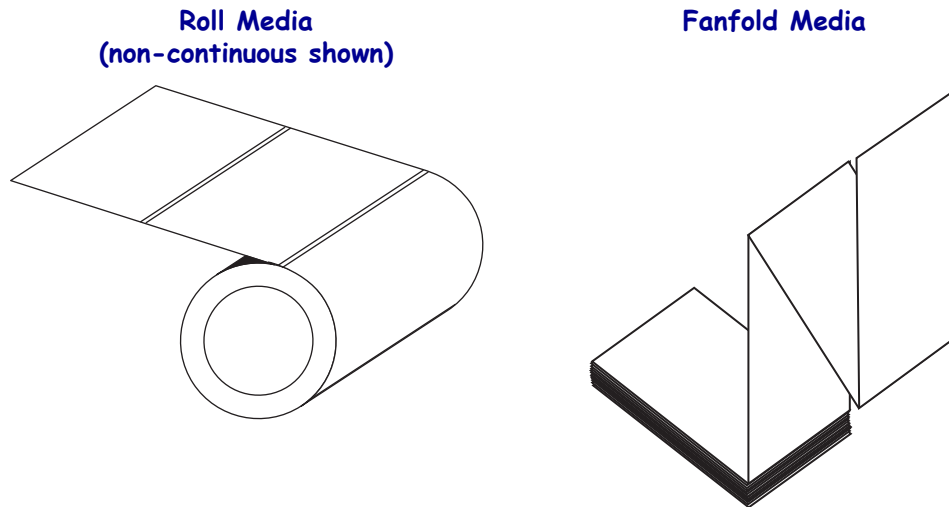


Note • RS-422 and RS-485 applications should use twisted shielded pairs as recommended in the TIA/EIA-485 Specification.

Types of Media

Your printer is capable of using various forms of media. These include roll and fanfold media (Figure 9) that may be labels or card stock and that may have optional perforations or registration holes. The media also may have a radio frequency identification (RFID) chip and antenna inlay embedded in it (sometimes called “smart” labels). The following sections contain descriptions of the various types of media approved for use in your printer.

Figure 9 • Roll and Fanfold Media



Selecting Media

We strongly recommend the use of Zebra-brand supplies for continuous high-quality printing. A wide range of paper, polypropylene, polyester, and vinyl stock has been specifically engineered to enhance the printing capabilities of the printer and to ensure against premature printhead wear.



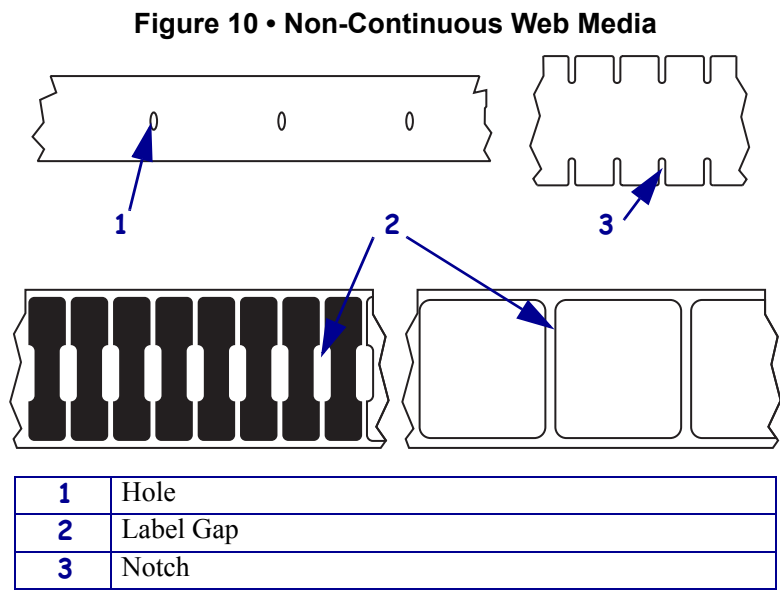
Important • Certain printing conditions may require that you adjust printing parameters, such as print speed, darkness, or print mode. These conditions include (but are not limited to):

- printing at high speeds
- cutting or peeling the media
- the use of extremely thin, small, synthetic, or coated labels

Because print quality is affected by these and other factors, it is important that you run tests to determine the best combination of printer settings and media for your application. A poor match may limit print quality or print rate, or the printer may not function properly in the desired print mode.

Non-Continuous Media

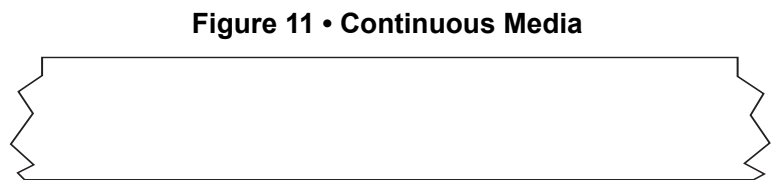
Non-continuous web media refers to individual labels that are separated by a gap, notch, or hole (Figure 10). When you look at the media, you can tell where one label ends and the next one begins.



Important • When using media that has holes or notches, position the sensor directly over a hole or notch.

Continuous Media

Continuous media (Figure 11) is one uninterrupted roll of material without gaps, holes, notches, or black marks. This allows the image to be printed anywhere on the label. The individual labels can be cut apart or stored in a roll for later use.

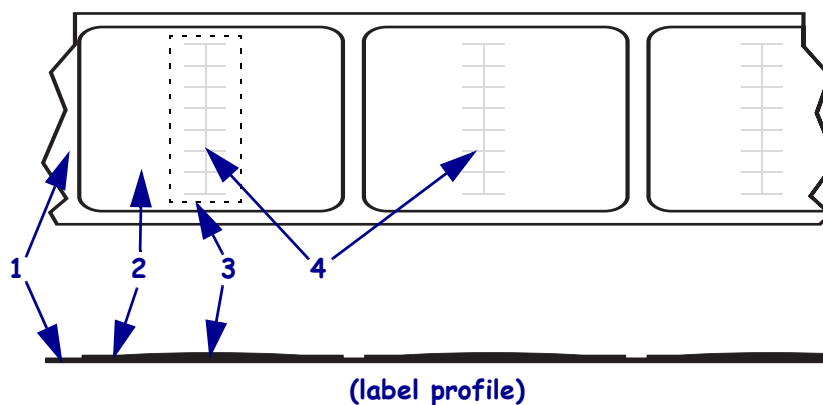


RFID “Smart” Labels

“Smart” labels are usually made from two components: media and an embedded RFID transponder (Figure 12). For more information about reading and encoding RFID tags, see [RFID Guidelines on page 61](#).

- The media (usually a label with a UHF transponder embedded between the label and liner) is usually comprised of synthetic- or paper-based material that can be printed upon using direct thermal or thermal transfer printing techniques. The media is typically made from the same materials and adhesives that a non-RFID barcode printer would use.
- The UHF transponder, which is sometimes called the RFID tag, is usually comprised of an antenna that is bonded to an integrated circuit (IC) chip. If you hold a “smart” label up to the light, you can see the transponder’s antenna embedded within the label, and you can feel a bump in the label where the IC chip is located.
- The IC chip contains the RF circuit, coders, decoders, and memory. At a minimum, “smart” labels have memory that can be read, while the vast majority also have memory that can be encoded by the user as well. For more information about encoding “smart” labels, see [ZPL II Commands for RFID on page 63](#).

Figure 12 • RFID “Smart” Labels



1	Liner
2	Label
3	Location of embedded transponder
4	Outline of transponder antenna (shape varies by manufacturer)

Ribbon

Ribbon is a thin film that is coated on one side with wax or wax resin, which is transferred to the media during the thermal transfer process. The media determines whether you need to use ribbon and how wide the ribbon must be.

When to Use Ribbon

Thermal transfer media requires ribbon for printing while direct thermal media does not. To determine if ribbon must be used with a particular media, perform a media scratch test.

To perform a label scratch test, complete these steps:

1. Scratch the print surface of the media with your fingernail.
2. Did a black mark appear on the media?

If a black mark...	Then...
Does not appear on the media	The media is thermal transfer . A ribbon is required with this type of media.
Appears on the media	The media is direct thermal . No ribbon is required for this type of media, though ribbon may be used to help protect the printhead from abrasion with the media.

Ribbon Width

When ribbon is used, it must be as wide as 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.

Coated Side of Ribbon

Ribbon can be wound with the coated side on the inside or outside (see [Figure 13](#)). If you are unsure which side of a particular roll of ribbon is coated, perform an adhesive test or a ribbon scratch test to determine which side is coated.

Figure 13 • Ribbon Coated on Outside or Inside



Adhesive Test

If you have labels available, perform the adhesive test to determine which side of a ribbon is coated. This method works well for ribbon that is already installed.

To perform an adhesive test, complete these steps:

1. Peel a label from its backing.
2. Press a corner of the sticky side of the label to the outer surface of the roll of ribbon.
3. Peel the label off of the ribbon.
4. Observe the results. Did flakes or particles of ink from the ribbon adhere to the label?

If ink from the ribbon...	Then...
Adhered to the label	The ribbon is coated on the outer surface.
Did not adhere to the label	The ribbon is likely coated on the inner surface. a. Press a corner of the sticky side of the label to the inner surface of the roll of ribbon. b. Peel the label off of the ribbon. c. Observe the results again. The ink from the ribbon should have adhered to the label. If the ink did not stick either time, repeat the adhesive test with a stickier adhesive, or perform the ribbon scratch test.

Ribbon Scratch Test

If you do not have labels available, perform the ribbon scratch test. This method works best if the ribbon is not installed.

To perform a ribbon scratch test, complete these steps:

1. Unroll a short length of ribbon.
2. Place the unrolled section of ribbon on a piece of paper with the outer surface of the ribbon in contact with the paper.
3. Scratch the inner surface of the unrolled ribbon with your fingernail.
4. Lift the ribbon from the paper.

5. Observe the results. Did the ribbon leave a mark on the paper?

If the ribbon...	Then...
Left a mark on the paper	The ribbon is coated on the outer surface.
Did not leave a mark on the paper	The ribbon is likely coated on the inner surface. - Flip the ribbon over on the paper so the inner side of the ribbon comes in contact with the paper. - Scratch the outer surface of the unrolled ribbon with your fingernail. - Lift the ribbon from the paper. - Observe the results again. The ribbon should have left a mark on the paper. If not, repeat the test, starting with the first side again. You may need to scratch the surface of the ribbon harder.



Notes •

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Fax: 1.847.821.1795 Attention: TechPubs — CTC



Printer Operation

If you have completed the tasks and resolved the issues in the checklist in *Before You Begin* on page 8, follow the instruction in this chapter to load and calibrate your printer and to print configuration labels.

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Load the Printer

This section gives you a series of instructions to load labels and ribbon (if used). The instructions that follow are for a standard printer in Tear-Off Mode.



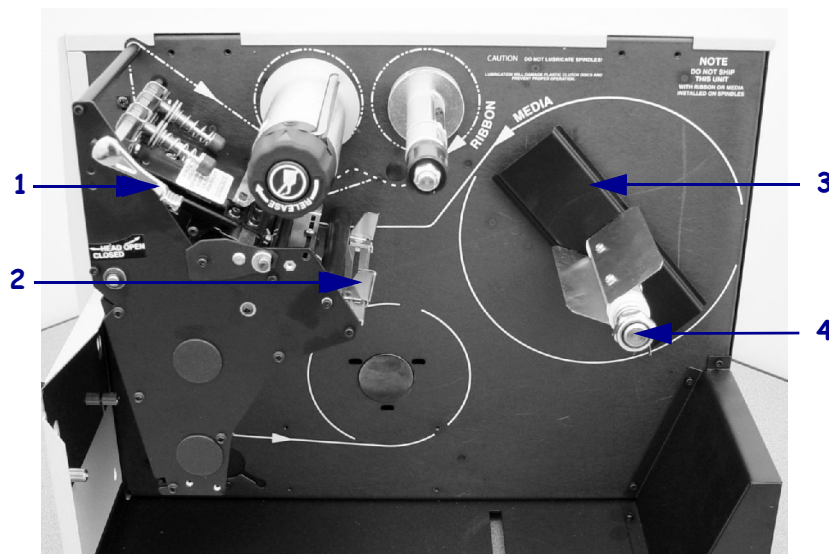
Caution • Be sure the printer is Off (O) if you have connected the power cable.

Load Roll Media

Roll media feeds through the printer from the media hanger or media supply spindle.

Figure 14 identifies the components of the printer that you need to be familiar with to load roll media.

Figure 14 • Interior Components for Media Loading



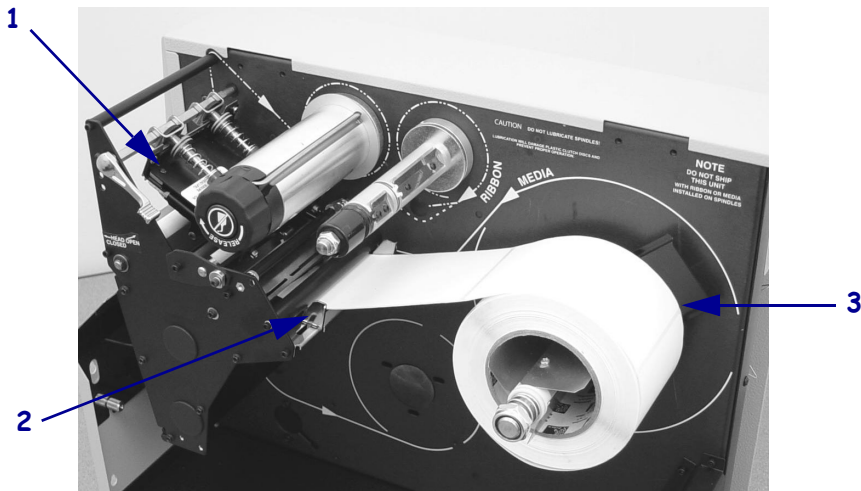
1	Printhead lever
2	Media guide
3	Media back plate
4	Optional media spindle

To load roll media, complete these steps:

1. Open the printhead.
2. Slide the media guide away from the printer frame. You might need to loosen the media guide screw.
3. Put the roll of media on the media hanger or spindle. If using a media hanger, adjust the media guide on the hanger so it just touches the media.
4. Push the label core toward the printer frame. The labels must be aligned with the label core.
5. Feed the media under the media guide roller and under the printhead.

6. Adjust the media guide so it is just touching, but does not restrict, the edge of the media. The labels should lie flat as shown in [Figure 15](#).

Figure 15 • Media Position



1	Printhead
2	Media guide
3	Labels/media

7. Which type of media are you using?

If you are...	Then...
Using direct thermal media	Close the printhead and go to Print a Printer Configuration Label on page 31.
Using thermal transfer media	Go to Load Ribbon on page 26.
Not sure	Go to When to Use Ribbon on page 17.

Load Fanfold Media

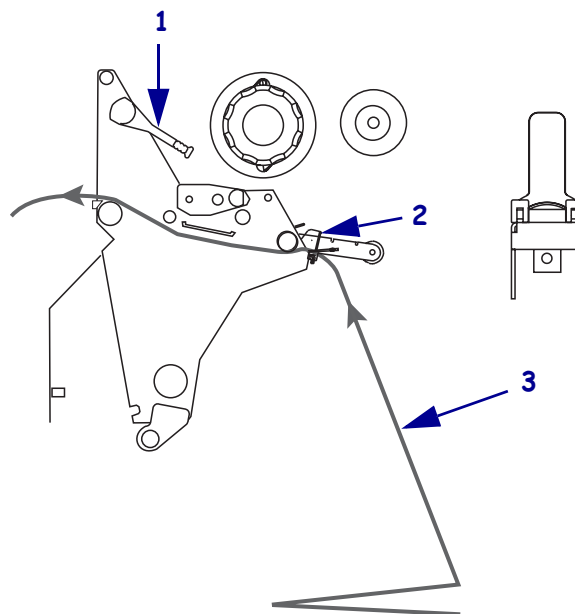
Fanfold media feeds through either the bottom or rear access slot from outside the printer. The media hanger and media supply spindle are **not** used with fanfold media.

To load fanfold labels, complete these steps:

1. Slide the printhead lever to the Open position.
2. Slide the media guide as far from the printer frame as possible.
3. How do you want to feed the fanfold labels?
 - **From the bottom slot in the printer body.**

Figure 16 shows the printer with fanfold labels loaded through the bottom slot.

Figure 16 • Fanfold Media—Bottom Loading

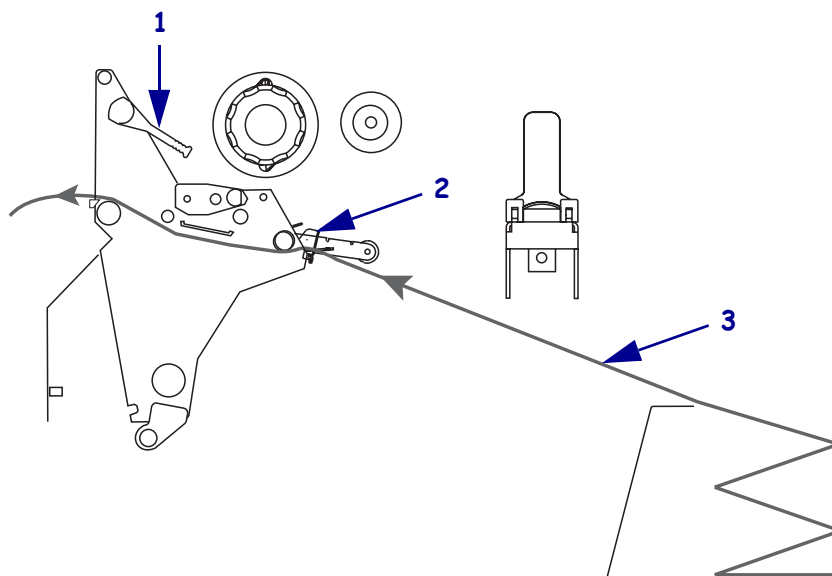


1	Printhead lever (shown in the Open position)
2	Media guide
3	Fanfold labels

- From the rear slot in the printer body.

Figure 17 shows the printer with fanfold labels loaded through the rear slot.

Figure 17 • Fanfold Media—Rear Loading



1	Printhead lever (shown in the Open position)
2	Media guide
3	Fanfold labels

4. Adjust the media guide so it just touches, but does not restrict, the edge of the labels. The labels should lie flat.
5. Which type of media are you using?

If you are...	Then...
Using direct thermal media	Close the printhead and go to <i>Print a Printer Configuration Label</i> on page 31.
Using thermal transfer media	Go to <i>Load Ribbon</i> on page 26.
Not sure	Go to <i>When to Use Ribbon</i> on page 17.

Load Ribbon

Before you load ribbon, make sure that the labels that you are using need ribbon. Only thermal transfer media requires ribbon. Ribbon is not required with direct thermal media, though it may be used to protect the printhead from abrasion. For more information, see [When to Use Ribbon on page 17](#).

Caution • Use ribbon that is wider than the thermal transfer media. If the printhead is not protected by the ribbon, the resulting abrasion from the media may cause premature printhead wear.

A ribbon leader makes it easier to load and unload ribbon. Make a leader for your ribbon roll if it does not already have one.

To make a ribbon leader, complete these steps:

1. Unroll the ribbon about 6 in. (15 cm).
2. Tear off a strip of labels and backing about 6 in. (15 cm) long from the label roll.
3. Peel a label from the backing.
4. Overlap the ribbon and the backing with the ribbon on top, and use the label to tape them together. This serves as a ribbon leader ([Figure 18](#)).

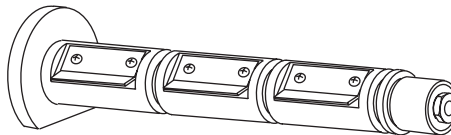
Figure 18 • Ribbon Leader



To load the ribbon, complete these steps:

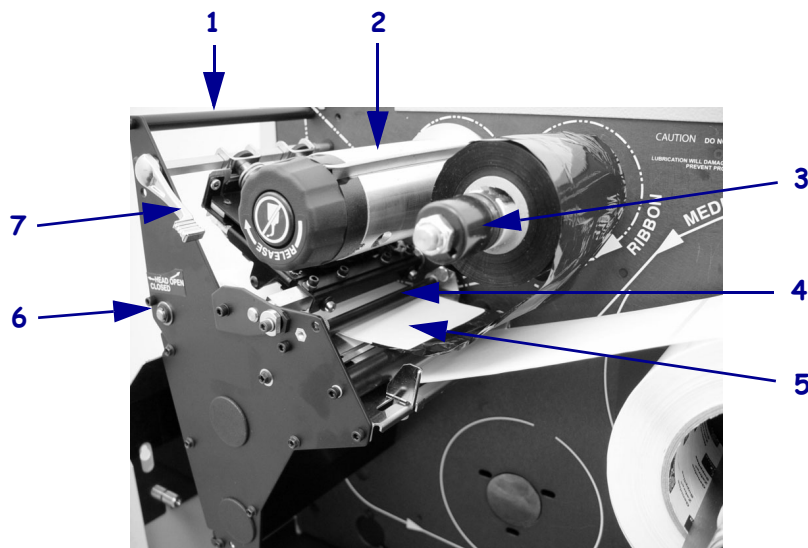
1. Align the segments of the ribbon supply spindle as shown in [Figure 19](#).

Figure 19 • Ribbon Supply Spindle Segments



2. Place the roll of ribbon on the ribbon supply spindle, and push the core as far back as it can go. [Figure 20](#) shows the printer components that are mentioned in this procedure.

Figure 20 • Interior Components for Ribbon Loading

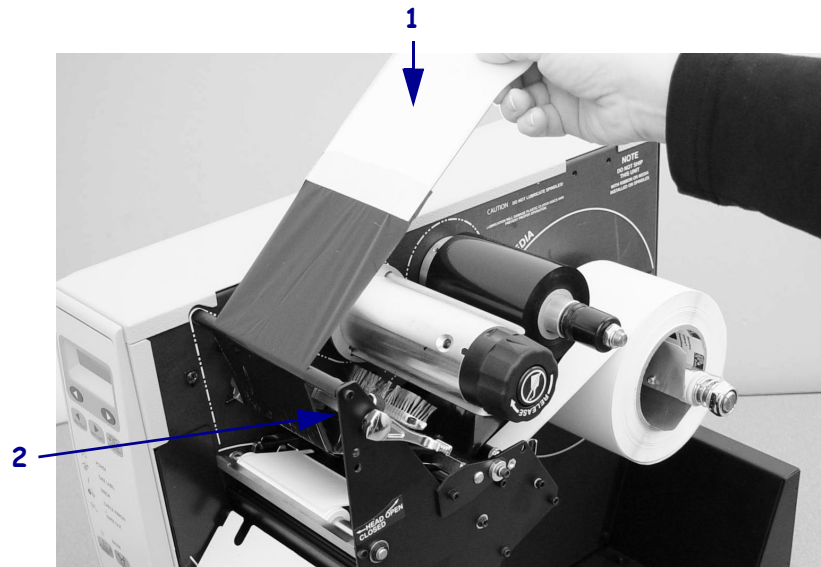


1	Top roller
2	Ribbon take-up spindle
3	Ribbon supply spindle
4	Ribbon guide roller
5	Ribbon leader attached to ribbon
6	Platen roller (not shown)
7	Printhead lever (shown in the Open position)

3. If the printhead is closed, open it using the printhead lever.
4. Thread the ribbon leader and attached ribbon under the ribbon guide roller, through the print mechanism, and past the platen roller.

5. Pull the ribbon leader over the printhead and above the top roller (Figure 21).

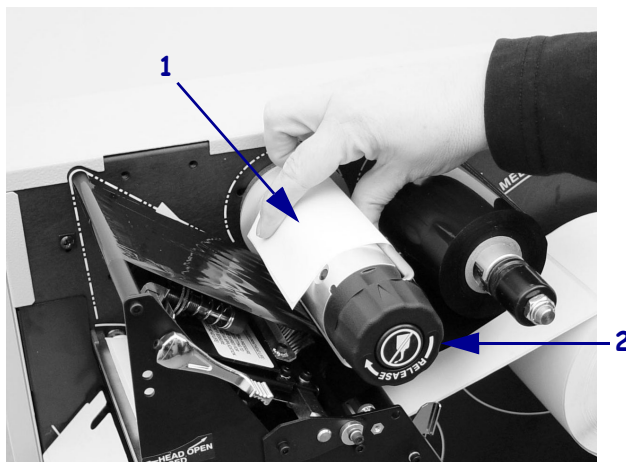
Figure 21 • Threading Ribbon Past Printhead and Platen Roller



1	Ribbon leader
2	Printhead

6. Bring the ribbon leader and ribbon under the ribbon take-up spindle, and wrap them around the spindle. Figure 22 shows the ribbon leader wrapped around the ribbon take-up spindle.

Figure 22 • Wrapping Ribbon around Spindle



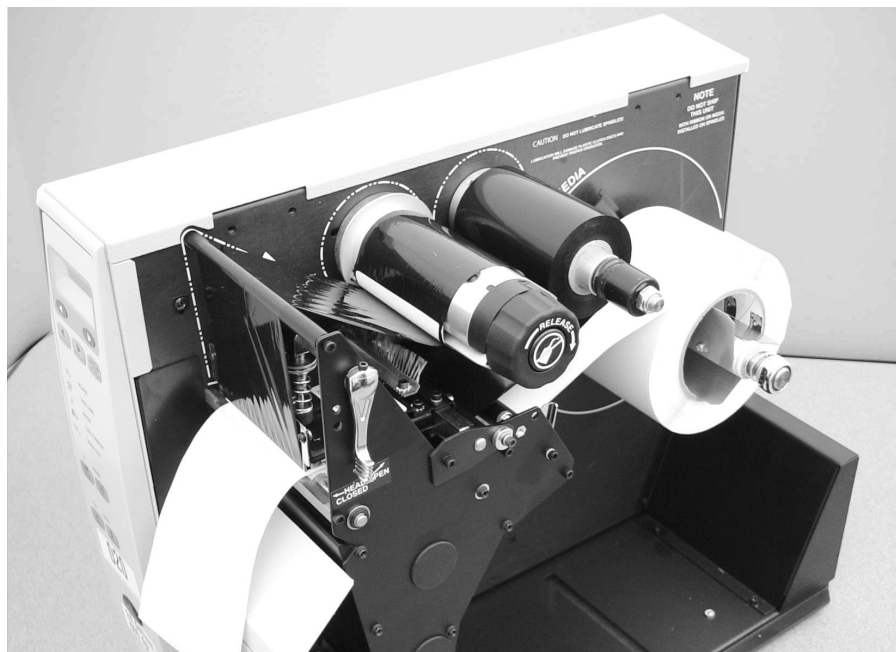
1	Ribbon leader
2	Ribbon take-up spindle

7. Turn the ribbon take-up spindle counterclockwise until the ribbon stays on it, as shown.

8. Close the printhead.

Figure 23 shows how your printer should look with the media and ribbon loaded.

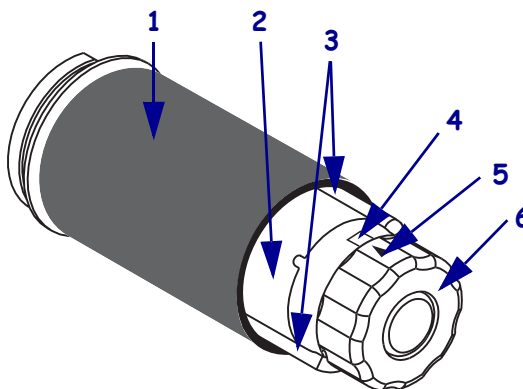
Figure 23 • Ribbon Loaded in Printer



Remove Used Ribbon

When the ribbon has run out or must be changed, remove the used ribbon from the take-up spindle (Figure 24).

Figure 24 • Ribbon Take-Up Spindle



1	Used ribbon
2	Ribbon take-up spindle
3	Ribbon release bars
4	Notch in ribbon take-up spindle
5	Arrow on ribbon take-up spindle
6	Ribbon release knob

To remove used ribbon, complete these steps:

1. Open the printhead.
2. Has the ribbon run out?

If the ribbon...	Then
Ran out	Continue with the next step.
Did not run out	Tear or cut the ribbon as close to the ribbon take-up spindle as possible. Caution • Do not cut through the ribbon that is on the take-up spindle because you may damage the spindle. Use the release knob to slide the ribbon off of the spindle.

3. While holding the ribbon take-up spindle, turn the ribbon release knob clockwise until it stops.
The ribbon release bars pivot down, easing the spindle's grip on the used ribbon.
4. Slide the used ribbon off of the ribbon take-up spindle.
5. Align the arrow on the ribbon take-up spindle knob with the notch in the ribbon take-up spindle.
6. To load new ribbon, see [Load Ribbon on page 26](#).

Print a Printer Configuration Label

When you have loaded the media and ribbon (if necessary), print a printer configuration label to use as a record of your printer settings. Keep the label for baseline information on your printer when troubleshooting printing problems.



Caution • For personal and equipment safety, always use an approved three-conductor power cord specific to the region or country intended for installation. This cord must use an IEC 320 female connector and the appropriate region-specific three-conductor grounded plug configuration.

To print a configuration label, complete these steps:

1. Connect the power cord to the power connection on the back of the printer.
2. To confirm the power connection, turn the printer On (I).
The printer performs the power-up self test (POST). When the test is complete, PRINTER READY displays on the front panel LCD.

3. Does the front panel LCD display PRINTER READY?

If...	Then...
Yes	Continue with the next step.
No	Go to Troubleshooting on page 99 .

4. Turn the printer Off (O).
5. Press and hold CANCEL while turning the printer On (I).
6. Release CANCEL when the DATA light turns off (approximately five seconds).
The configuration label prints ([Figure 25](#)).
7. Did the label print?

If a configuration label...	Then...
Printed	Connect the printer to your data source. Communication can be handled in many different ways. More information about the options is available in Select a Communication Interface on page 12 .
Did not print	Sensors out of position is a common cause of printing problems. Refer to Adjust and Calibrate Sensors on page 34 . For additional assistance, refer to Troubleshooting on page 99 .

Figure 25 • Printer Configuration Label

PRINTER CONFIGURATION	
Zebra Technologies	
ZTC R110KIIIPlus-200dpi	
04.0.....	DARKNESS
2 IPS.....	PRINT SPEED
+000.....	TEAR OFF
TEAR OFF.....	PRINT MODE
CONTINUOUS.....	MEDIA TYPE
WEB.....	SENSOR TYPE
THERMAL-TRANS.....	PRINT METHOD
104 0/8 MM.....	PRINT WIDTH
2000.....	LABEL LENGTH
39.0IN 988MM.....	MAXIMUM LENGTH
MEDIA DISABLED.....	EARLY WARNING
MAINT. OFF.....	EARLY WARNING
NOT CONNECTED.....	USB COMM.
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
<~> ZEH.....	CONTROL PREFIX
<~> SEH.....	FORMAT PREFIX
<~> 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
CALIBRATION.....	MEDIA POWER UP
CALIBRATION.....	HEAD CLOSE
DEFAULT.....	BACKFEED
+000.....	LABEL TOP
+0000.....	LEFT POSITION
OFF.....	VERIFIER PORT
OFF.....	APPLICATOR PORT
PULSE MODE.....	START PRINT SIG
FEED MODE.....	RESYNCH MODE
050.....	WEB S.
079.....	MEDIA S.
072.....	RIBBON S.
089.....	TAKE LABEL
050.....	MARK S.
000.....	MARK MED S.
084.....	MEDIA LED
003.....	RIBBON LED
000.....	MARK LED
+10.....	LCD ADJUST
DPSWFXM.....	MODES ENABLED
.....	MODES DISABLED
932 8/MM FULL.....	RESOLUTION
SP386F <.....	FIRMWARE
V19.0.0.56.....	HARDWARE ID
CUSTOMIZED.....	CONFIGURATION
NONE.....A:	COMPACT FLASH
12160K.....R:	RAM
NONE.....B:	MEMORY CARD
2048K.....E:	ONBOARD FLASH
NONE.....	FORMAT CONVERT
005 DISPLAY.....	P32 INTERFACE
.....	TWINAX/COAX ID
FW VERSION.....	IDLE DISPLAY
06/10/04.....	RTC DATE
11:08.....	RTC TIME
DYNAMIC.....	IP RESOLUTION
ALL.....	IP PROTOCOL
010.003.005.187.....	IP ADDRESS
255.255.255.000.....	SUBNET MASK
010.003.005.001.....	DEFAULT GATEWAY
Matrics : 04.A1.01.....	RFID VERSION
1500 IN.....	NONRESET CNTR
1500 IN.....	RESET CNTR1
1500 IN.....	RESET CNTR2
3806 CM.....	NONRESET CNTR
3806 CM.....	RESET CNTR1
3806 CM.....	RESET CNTR2
335 LABLS.....	NONRESET CNTR
335 LABLS.....	RESET CNTR1
335 LABLS.....	RESET CNTR2
GK 20518.04DL06202.41008.02.VH1	

Calibrate the Printer

There are five different ways that the printer can be calibrated. You may calibrate the printer as needed.

- **Auto-calibration** occurs when the printer feeds media after the printhead is closed and when the printer is first turned on (see [Media Power Up on page 54](#) and [Head Close on page 54](#) for options). The printer automatically sets the value it detects for the spaces between labels. This type of calibration also happens as part of both the sensor profile and media and ribbon sensor calibration procedures.
- **Long Calibration**, which you select by pressing PAUSE then CALIBRATE, calibrates the printer for media length, media type (continuous or non-continuous), and print mode (thermal or direct thermal transfer) and updates the sensor values. This calibration is the same as what is performed when **Calibration** is selected for the MEDIA POWER UP and HEAD CLOSE parameters. For more information, see [Media Power Up on page 54](#) or [Head Close on page 54](#).
- **Short Calibration**, which is a selection for the MEDIA POWER UP and HEAD CLOSE parameters, uses current sensor values rather than detecting the spaces between labels and resetting the sensors. This calibration sequence may use fewer labels than the long calibration sequence, but it is less reliable because the values that are stored in the sensors could be incorrect. For more information, see [Media Power Up on page 54](#) or [Head Close on page 54](#).
- **Sensor Profile Calibration**, which you select through the front panel, auto-calibrates the printer and prints a media sensor profile. See [Sensor Profile on page 49](#) for instructions.
- **Media and Ribbon Sensor Sensitivity Calibration**, which you select through the front panel, resets the sensitivity of the sensors to detect correctly the media and ribbon that you are using. See [Media and Ribbon Sensor Calibration on page 34](#) for instructions. If you change the type of ribbon and/or media, you might need to reset the sensitivity of the media and ribbon sensors. When the sensors are at their new sensitivity, the printer performs an auto-calibration.

Adjust and Calibrate Sensors

This section describes how to adjust and calibrate sensors.

Media and Ribbon Sensor Calibration

Media and ribbon sensor calibration is one of the most common adjustments to the printer settings. This procedure is performed through the front panel.

Indications that the sensitivity may need to be reset are:

- The CHECK RIBBON light is on even though the ribbon is properly installed.
- Non-continuous labels are being treated as continuous labels.



Note • Before you begin the calibration procedure, make sure that the maximum length is set to a value 1 in. (25.4 mm) greater than the length of the labels that you are using. If the maximum length is set to a lower value, the calibration process assumes that continuous media is in the printer.



Important • This procedure must be followed exactly as presented. All of the steps must be performed even if only one of the sensors requires adjustment. You may press the left oval at any step in this procedure to cancel the procedure.

To adjust the sensitivity of media and ribbon sensors, complete these steps:

1. From the front panel, press the right oval to start the calibration procedure.
The LOAD BACKING prompt displays.
2. Open the printhead.
3. Remove approximately 8 in. (203 mm) of labels from the media backing, and pull the media into the printer so that only the backing is between the media sensors.
4. Leave the printhead open.
5. Press the right oval to continue.
The REMOVE RIBBON prompt displays.
6. Remove the ribbon (if used).
7. Close the printhead.
8. Press the right oval to continue.
The message CALIBRATING PLEASE WAIT displays.
The printer adjusts the scale (gain) of the signals that it receives from the media and ribbon sensors. On the sensor profile, this essentially corresponds to moving the peak of the graph up or down to optimize the readings for your application (for more information, see [Sensor Profile on page 49](#)).
When calibration is complete, RELOAD ALL displays.
9. Open the printhead and pull the media forward until a label is positioned under the media sensor.
10. Reload the ribbon (if used) into its proper position.

11. Close the printhead.

12. Press the right oval to continue.

The printer does a calibration equivalent to pressing **CALIBRATE**; during this process, the printer determines the label length. To see the new readings on the new scale, print a sensor profile.

Transmissive (Media) Sensors

The transmissive sensor consists of two sections: a light source (the lower media sensor) and a light sensor (the upper media sensor). The media passes between the two.

Adjust these sensors only when the printer cannot detect the top of the label. The front panel LCD displays **ERROR CONDITION PAPER OUT**, even though there are labels loaded in the printer.

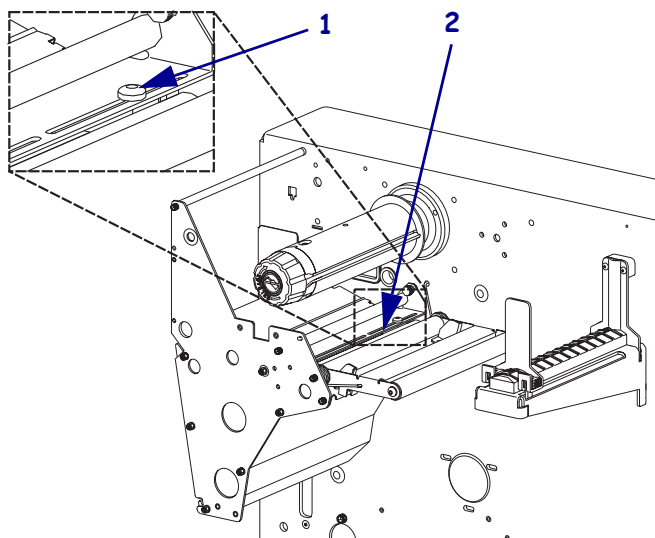


Note • The upper media sensor can be positioned along the inside half of the media (the side closest to the back of the printer) or the outside half of the media (the side farthest from the back of the printer).

To adjust the upper media sensor for the inside half of the media, complete these steps:

1. Remove the ribbon (if ribbon is used).
2. Locate the upper media sensor (Figure 26). The upper media sensor eye is directly below the adjustment screw head.

Figure 26 • Upper Media Sensor Location



1	Upper media sensor adjustment screw
2	Upper media sensor

3. Slightly loosen the upper media sensor adjustment screw using a Phillips-head screwdriver.
4. Using the tip of the screwdriver, slide the upper sensor along the slot to the desired position (for non-continuous media with a notch or hole in the media, the sensor must be directly above the notch or hole).
5. Tighten the adjustment screw to secure the upper media sensor.

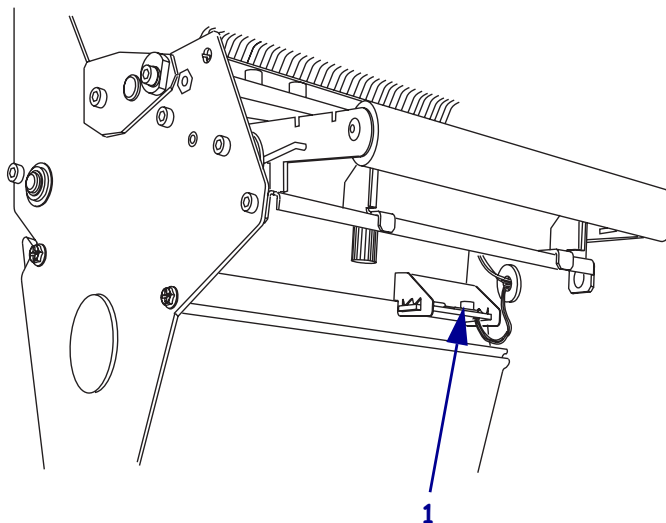
To adjust the upper media sensor for the outside half of the media:

1. Remove the ribbon (if ribbon is used).
2. Locate the upper media sensor. The upper media sensor eye is directly below the adjustment screw head.
3. Remove the upper media sensor adjustment screw using a Phillips-head screwdriver.
4. Lift the upper media sensor assembly from the slot, and move it and the wire cover to the outside slot. Carefully pull the wires through the cable tie. You may need to set aside the sensor wire cover if the adjustment is too far to the outside.
5. Replace and slightly tighten the adjustment screw.
6. Slide the upper media sensor along the slot to the desired position (for non-continuous media with a notch or hole in the media, the sensor must be directly above the notch or hole).
7. Tighten the adjustment screw.
8. Make sure that the wires are routed back into the groove of the media sensor bracket.

To adjust the lower media sensor, complete these steps:

1. Locate the lower media sensor assembly under the rear roller (Figure 27). The sensor is a spring clip holding a circuit board.

Figure 27 • Lower Media Sensor Location



1	Lower media sensor
----------	--------------------

2. Slide the lower sensor until it is under the upper media sensor. Gently pull wires out as needed (wires should have a little slack).
3. If you move the sensor inward and a large loop of wire develops, remove the electronics cover from the side of the printer, and gently pull the wires through. Clamp the wires so that they do not rub any drive belts.

Adjust Printhead Pressure and Toggle Position

Printhead pressure is one factor that affects print quality. If the toggle pressure is too light or uneven, the labels and ribbon may slip.



Important • Print quality depends on the labels and ribbon used as well as the toggle pressure. Make sure that your labels and ribbon are right for your application.

- **Direct thermal media** does not need ribbon.
- **Thermal transfer media** needs ribbon.

Toggle Position Adjustment

Toggle adjustment may be needed if printing is too light on one side or if thick labels are used. The toggles should be positioned so they provide even pressure on the labels. Slide the toggles to the desired location. If the labels are too narrow to fit both toggles, position one toggle over the center of the labels and decrease the pressure on the unused toggle.

Printhead Pressure Adjustment

If positioning the toggles properly does not solve the problem, adjust printhead pressure. Maximize printhead life by using the lowest pressure that produces the desired print quality.

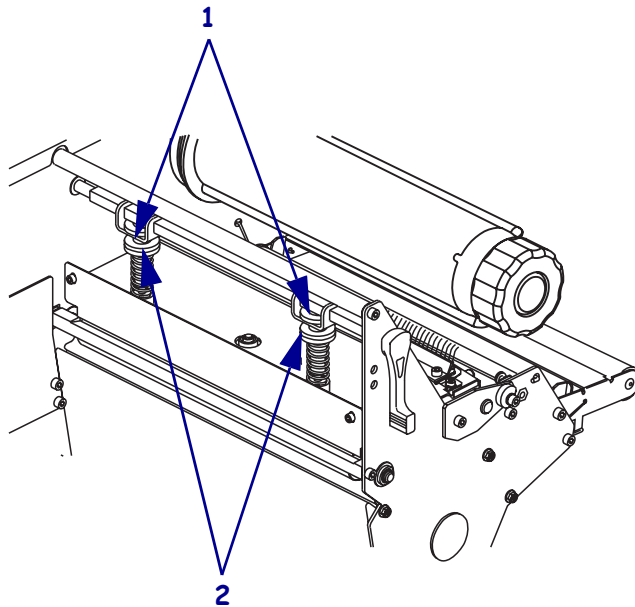


Caution • Observe proper electrostatic safety precautions when handling any static-sensitive components such as circuit boards and printheads.

To adjust printhead pressure, complete these steps:

1. Print some labels at 2.4 in. (61 mm) per second by running the *PAUSE Self Test* on page 110.
2. While printing labels, use the front panel controls to lower the darkness setting until the labels are printing gray instead of black.
3. Loosen the locking nuts at the top of the toggle assemblies (Figure 28).

Figure 28 • Toggle Assemblies



1	Locking nuts
2	Adjusting nuts

4. Some media types require higher pressure to print well. For these media types, increase or decrease pressure using the adjusting nuts until the left and right edges of the printed area are equally dark.
5. Increase the darkness level using the front panel controls until the printing is clear.
6. Tighten the locking nuts.



Printer Operation

Adjust Printhead Pressure and Toggle Position



Notes • _____

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Front Panel Controls

This chapter describes the function of the front panel.

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Overview

After you have installed media and ribbon and printed a configuration label, you can change the printer's settings using the front panel controls. For an overview of the front panel, including descriptions of the buttons and lights, see [Front Panel on page 3](#). If you need to restore the printer to its factory default settings, see [FEED and PAUSE Self Test on page 112](#).

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

Enter Setup Mode

To enter Setup Mode, complete these steps:

1. Press **SETUP/EXIT** to enter Setup Mode.
2. Press either **NEXT/SAVE** or **PREVIOUS** to scroll through the parameters.

Exit Setup Mode

To leave Setup Mode, complete these steps:

1. Press **SETUP/EXIT**.
The LCD displays **SAVE CHANGES**.
2. Press the left or right oval to display the save options ([Table 4](#)).

Table 4 • Save Options When Leaving Setup Mode

LCD Display	Description
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 the darkness and tear-off settings (if they were changed).
LOAD DEFAULTS	Sets all parameters other than the network settings back to the factory defaults. To see the factory default values, see Front Panel LCD on page 44 . Note • Loading factory defaults causes the printer to auto-calibrate.
LOAD LAST SAVE	Loads values from the last permanent save.
DEFAULT NET	Sets the wired and wireless network settings back to factory defaults.

3. Press **NEXT/SAVE** to select the displayed choice.
When the configuration and calibration sequence is done, **PRINTER READY** displays.

Password-Protected Parameters

Certain parameters are password-protected by factory default, including the communication parameters.



Note • If the parameters are set incorrectly, the printer may function unpredictably.

The first attempt to change a password-protected parameter (pressing one of the ovals) requires you to enter a four-digit password at the `ENTER PASSWORD` display. The left oval changes the selected digit position; the right oval increases the selected digit value. After entering the password, press `NEXT/SAVE`. The parameter you wish to change is displayed. If the password was entered correctly, you can now change the value.

The first time that you attempt to change a password-protected parameter, the printer displays `ENTER PASSWORD`. Before you can change the parameter, you must enter the four-digit password. After you have entered the password correctly, you do not have to enter it again unless you leave Setup Mode by pressing `SETUP/EXIT` or by turning the printer Off (O).

To Enter a Password for a Password-Protected Parameter, complete these steps:

1. At the password prompt, use the left oval to change the selected digit position.
2. When you have selected the digit that you wish to change, use the right oval to increase the selected digit value. Repeat these two steps for each digit of the password.
3. After entering the password, press `NEXT/SAVE`.
The parameter you selected to change is displayed. If the password was entered correctly, you can change the value.

Default Password Value

The default password value is **1234**. The password can be changed using the `^KP` (Define Password) ZPL II instruction or through ZebraLink™ WebView (ZebraNet® PrintServer II required).

Disable the Password Protection Feature

You can disable the password protection feature so that it no longer prompts you for a password by setting the password to **0000** via the `^KP0` ZPL/ZPL II command. To reenable the password-protection feature, send the ZPL/ZPL II command `^KPx`, where **x** can be any number from 1 to 9999.

Front Panel LCD

Use the LCD display on the front panel to adjust printer settings. [Table 5](#) shows parameters in the order in which they are displayed when you press **NEXT/SAVE** after entering setup mode. Throughout this process, press **NEXT/SAVE** to continue to the next parameter, or press **PREVIOUS** to return to the previous parameter in the cycle. [Table 6 on page 59](#) shows the additional parameters that appear when a wireless print server is installed in the printer.

Table 5 • Printer Parameters (Sheet 1 of 15)

Parameter	Action/Explanation
DARKNESS	Adjusting Print Darkness Darkness settings depend on a variety of factors, including ribbon type, labels, and the condition of the printhead. You may adjust the darkness for consistent high-quality printing. If printing is too light, or if there are voids in printed areas, you should increase the darkness. If printing is too dark, or if there is spreading or bleeding of printed areas, you should decrease the darkness. Darkness settings also may be changed by the driver or software settings. The FEED Self Test described in FEED Self Test on page 111 can also be used to determine the best darkness setting. Because the darkness setting takes effect immediately, you can see the results on labels that are currently printing. Important • Set the darkness to the lowest setting that provides good print quality. If the darkness is set too high, the ink may smear, the ribbon may burn through, or the printhead may wear prematurely. • Press the right oval to increase darkness. • Press the left oval to decrease darkness. Default: +4 Range: 0 to +30.0
PRINT SPEED	Adjusting Print Speed Slower print speeds typically yield better print quality. Print speed changes take effect upon exiting the menu mode. • Press the right oval to increase print speed. • Press the left oval to decrease print speed. Default: 2 ips Range: 2 ips to +12 ips (depends on specific printer)
TEAR OFF	Adjusting the Tear-Off Position This parameter establishes the position of the labels over the tear-off/peel-off bar after printing. Each press of an oval adjusts the tear-off position by four dot rows. • Press the right oval to increase value. • Press the left oval to decrease value. Default: +0 Range: –120 to +120

Table 5 • Printer Parameters (Sheet 2 of 15)

Parameter	Action/Explanation
PRINT MODE	Selecting Print Mode Print mode settings tell the printer the method of label delivery that you wish to use. Be sure to select a print mode that your hardware configuration supports because some of the selections displayed are for optional printer features. Press either oval to display choices. Default: Tear-Off Selections: Tear-Off, Peel-Off, Cutter, Applicator, Rewind Note • Only Tear-Off mode is supported.
MEDIA TYPE	Setting Media Type This parameter tells the printer the type of media that 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). When non-continuous media is selected, the printer feeds media to calculate label length (the distance between two recognized registration points of the inter-label gap, webbing, or alignment notch or hole). Press either oval to display choices. Default: Non-Continuous Selections: Continuous, Non-Continuous
SENSOR TYPE	Setting the Sensor Type This parameter tells the printer whether you are using media with a web (gap/space between labels, notch, or hole) to indicate the separations between labels or if you are using media with a black mark printed on the back. If your media does not have black marks for registration on the back, leave your printer at the default (web). Press either oval to display other choices. Default: Web Selections: Web, mark Note • Only Web is supported.
PRINT METHOD	Selecting Print Method The print method parameter tells the printer the method of printing that you wish to use: direct thermal (no ribbon) or thermal transfer (using thermal transfer media and ribbon). Press either oval to display choices. Default: Thermal transfer Selections: Thermal transfer, direct thermal Note • Selecting direct thermal when using thermal transfer media and ribbon creates a printer error condition, but printing continues.

Table 5 • Printer Parameters (Sheet 3 of 15)

Parameter	Action/Explanation
PRINT WIDTH	Setting Print Width Print width determines the printable area across the width of the label. To change value shown: 1. Press the left oval to move the cursor. 2. Press the right oval to increase the value of the digit. Note • The printer does not accept any value larger than the maximum print width listed in General Specifications on page 117. To change the unit of measurement: a. Press the left oval until the unit of measurement is active. b. Press the right oval to toggle to a different unit of measure (mm, inches, or dots). Default Range: The default and range of acceptable values vary depending on what printer you have. See General Specifications on page 117 for further information about the ranges available for your model.
MAXIMUM LENGTH	Setting Maximum Length Maximum length is used in conjunction with the calibration procedure. The value of this setting is the maximum label length that is used during the media portion of the calibration process. Only a few labels are required to set media sensors. Always set the value that is at least 1 in. (25.4 mm) longer than the longest label to be used on the printer. • To increase the value, press the right oval. • To decrease the value, press the left oval. Default Range: The default and range of acceptable values vary depending on your printer's configuration. Values are adjustable in 1 in. (25.4 mm) increments.

Table 5 • Printer Parameters (Sheet 4 of 15)

Parameter	Action/Explanation
EARLY WARNING	Setting Early Warning When this parameter is enabled, the printer provides warnings when labels or ribbons are running low or when the printhead needs to be cleaned. Note • Labels per roll and ribbon length need to be updated when beginning use of the Early Warning System. Also, the printer does not make any adjustments when power is turned off and on. • Press the right or left oval to display other choices. Default: MEDIA DISABLED, MAINTENANCE OFF Selections: MEDIA DISABLED, MEDIA ENABLED, MAINTENANCE OFF, MAINTENANCE ON To change the Early Warning settings, 1. When the LCD displays EARLY WARNING, press the right or left oval until the desired setting is listed on the LCD. (If you are prompted for a password, enter your password using the instructions in Password-Protected Parameters on page 43.) 2. Press NEXT/SAVE to access the next early warning option. 3. Repeat this process to set the early warning for ribbon or maintenance (printhead cleaning). When the printer detects that less than 15% of the labels or ribbon remain, WARNING MEDIA LOW appears on the LCD. If the alert function has been enabled, an alert is also sent. When the printhead is opened then closed after a media or ribbon warning has been received, the LCD prompts with MEDIA REPLACED?. Press the right oval to select YES to clear the warning and reset the label counter. When setting the Early Warning for maintenance, the LCD prompts HEAD CLEAN?. 4. Press the right oval to select YES. 5. Press SETUP/EXIT to exit setup mode. 6. Press NEXT/SAVE to save changes.
LABELS PER ROLL	Setting Labels Per Roll This parameter needs to be updated when setting the Early Warning System so the printer can provide early warnings when labels are running low. • Press the right or left oval to display other choices. Default: 900 labels Range: 100 labels to 9999 labels
RIBBON LENGTH	Setting Ribbon Length This parameter must be updated when setting the Early Warning System so the printer can provide early warnings when ribbon is running low. • Press the right or left oval to display other choices. Default: 450 m Range: 100 m to 450 m
LIST FONTS	List Fonts • Press the right oval to print a label that lists the available fonts in the printer, including standard printer fonts plus any optional fonts. Fonts may be stored in RAM, Flash memory, font EPROMs, or font cards.

Table 5 • Printer Parameters (Sheet 5 of 15)

Parameter	Action/Explanation
LIST BAR CODES	List Bar Codes Press the right oval to print a label that lists the available bar codes in the printer.
LIST IMAGES	List Images Press the right oval to print a label that lists the available images stored in the printer's RAM, Flash memory, optional EPROM, or optional memory card.
LIST FORMATS	List Formats Press the right oval to print a label that lists the available formats stored in the printer's RAM, Flash memory, optional EPROM, or optional memory card.
LIST SETUP	List Setup Press the right oval to print a label that lists the current printer configuration. (Same label as shown in Print a Printer Configuration Label on page 31.)
LIST ALL	List All Press the right oval to print labels that list the available fonts, bar codes, images, formats, and the current printer configuration.
FORMAT CARD A B	Format Memory Card Caution • Perform this operation only when it is necessary to erase all previously stored information from the memory card. - When the LCD displays INITIALIZE CARD, press the left oval to select the A memory (internal CompactFlash) or the right oval to select B memory (PCMCIA card). (If you are prompted for a password, enter your password using the instructions in Password-Protected Parameters on page 43.) The front panel LCD asks ARE YOU SURE?. - Do you wish to continue? - Press the left oval to select NO to cancel the request and return to INITIALIZE CARD prompt. - Press the right oval to select YES and begin initialization. FORMATTING CARD displays. When formatting is complete, INITIALIZE CARD displays. Note • Depending on the amount of memory in the memory card, initialization may take up to three minutes to complete.

Table 5 • Printer Parameters (Sheet 6 of 15)

Parameter	Action/Explanation
INIT FLASH MEM	Initialize Flash Memory Caution • Perform this operation only when it is necessary to erase all previously stored information from Flash memory. - When the LCD displays INITIALIZE CARD, press the right oval to select YES. (If you are prompted for a password, enter your password using the instructions in Password-Protected Parameters on page 43.) The LCD asks INITIALIZE FLASH. - Press the right oval to select YES. The LCD asks ARE YOU SURE? - Do you wish to continue? - Press the left oval to select NO to cancel the request and return to the INIT FLASH MEM prompt. - Press the right oval to select YES and begin initialization. When formatting is complete, INIT FLASH MEM displays.
SENSOR PROFILE	Sensor Profile 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. Press the right oval to start this standard calibration procedure and print a media sensor profile. Figure 29 shows a media sensor profile. If the sensitivity of the media and/or ribbon sensors must be adjusted, use Calibrate Media and Ribbon Sensors on page 50 to adjust the media and ribbon sensor sensitivity.

Figure 29 • Media Sensor Profile

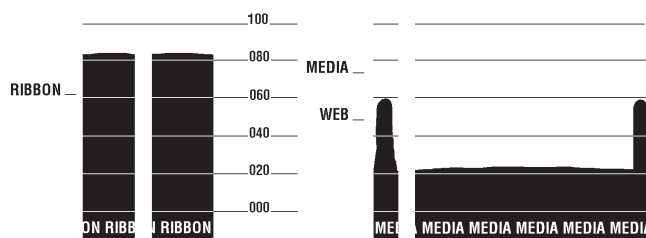


Table 5 • Printer Parameters (Sheet 7 of 15)

Parameter	Action/Explanation
MEDIA AND RIBBON CALIBRATE	Calibrate Media and Ribbon Sensors Use this procedure to adjust sensitivity of media and ribbon sensors. Important • This procedure must be followed exactly as presented. All of the steps must be performed even if only one of the sensors requires adjustment. You may press the left oval at any step in this procedure to cancel the procedure. - Press the right oval to start the calibration procedure. The <code>LOAD BACKING</code> prompt displays. - Open the printhead. - Remove approximately 8 in. (203 mm) of labels from the backing, and pull the media into the printer so that only the backing is between the media sensors. - Leave the printhead open. - Press the right oval to continue. The <code>REMOVE RIBBON</code> prompt displays. - Remove the ribbon. - Close the printhead. - Press the right oval to continue. The message <code>CALIBRATING PLEASE WAIT</code> displays. The printer adjusts the scale (gain) of the signals that it receives from the media and ribbon sensors. On the sensor profile, this essentially corresponds to moving the peak of the graph up or down to optimize the readings for your application. When calibration is complete, <code>RELOAD ALL</code> displays. - Open the printhead and pull the media forward until a label is positioned under the media sensor. - Reload the ribbon. - Close the printhead. - Press the right oval to continue. The printer does a calibration equivalent to pressing <code>CALIBRATE</code>; during this process, the printer determines the label length. To see the new readings on the new scale, print a sensor profile.
PARALLEL COMM	Setting Parallel Communications Select the communications port that matches the one being used by the host computer. Press the right or left oval to display other choices. Default: Bidirectional Selections: Bidirectional, unidirectional, or Twinax/coax
SERIAL COMM	Setting Serial Communications Select the communications port that matches the one being used by the host computer. Press the right or left oval to display other choices. Default: RS-232 Selections: RS-232, RS-422/485, RS-485 multidrop

Table 5 • Printer Parameters (Sheet 8 of 15)

Parameter	Action/Explanation
BAUD	Setting Baud 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. Press the right or left oval to display other choices. Default: 9600 Selections: 110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200
DATA BITS	Setting Data Bits 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. Note • Code Page 850 requires the data bits to be set to 8 bits. Press the right or left oval to display other choices. Default: 8 bits Selections: 7 bits, 8 bits
PARITY	Setting Parity 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. Press the right or left oval to display other choices. Default: NONE Selections: NONE, ODD, EVEN
HOST HANDSHAKE	Setting Host Handshake The handshake protocol of the printer must match the handshake protocol of the host computer for proper communications to take place. Select the handshake protocol that matches the one being used by the host computer. Press the right or left oval to display other choices. Default: XON/XOFF Selections: XON/XOFF, DSR/DTR, RTS/CTS
PROTOCOL	Setting Protocol 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</i>. Press the right or left oval to display other choices. Default: NONE Selections: NONE, ZEBRA, ACK_NAK Note • Zebra is the same as ACK_NAK, except that Zebra response messages are sequenced. If Zebra is selected, the printer must use DSR/DTR host handshake protocol.

Table 5 • Printer Parameters (Sheet 9 of 15)

Parameter	Action/Explanation
NETWORK ID	Setting Network ID 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 an RS-422/RS-485 network, you must select a network ID number. This does not affect TCP/IP or IPX networks. 1. Press the left oval to move to the next digit position. 2. Press the right oval to increase the value of the digit. Default: 000 Range: 000 to 999
COMMUNICATIONS	Setting Communications Mode 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 characters, with the hex value below the ASCII text. The printer prints all characters received, including control codes, like CR (carriage return). A sample printout is shown in Communications Diagnostics Test on page 112. Notes on diagnostic printouts are: • FE indicates a framing error. • OE indicates an overrun error. • PE indicates a parity error. • NE indicates noise. 1. Press the right or left oval to toggle between the choices. 2. For any errors, check that your communication parameters are correct. 3. Set the print width equal to or less than the label width used for the test. See Label Specifications on page 120 for more information. Default: NORMAL MODE Selections: NORMAL MODE, DIAGNOSTICS
CONTROL PREFIX	Control Prefix Character The printer looks for this two-digit hex character to indicate the start of a ZPL/ZPL II control instruction. Note • Do not use the same hex value for the control, format, and delimiter character. The printer must see different characters to work properly. 1. Press the left oval to move to the next digit position. 2. Press the right oval to increase the value of the digit. Default: 7E (tilde—displayed as a black square) Range: 00 to FF

Table 5 • Printer Parameters (Sheet 10 of 15)

Parameter	Action/Explanation
FORMAT PREFIX	Format Prefix Character The format prefix is a two-digit hex value used as a parameter place marker in ZPL/ZPL II format instructions. The printer looks for this 2-digit hex character to indicate the start of a ZPL/ZPL II format instruction. See the <i>ZPL II Programming Guide Volume I</i> for more information. Note • Do not use the same hex value for the control, format, and delimiter character. The printer must see different characters to work properly. 1. Press the left oval to move to the next digit position. 2. Press the right oval to increase the value of the digit. Default: 5E (caret) Range: 00 to FF
DELIMITER CHAR	Delimiter Character 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. Note • Do not use the same hex value for the control, format, and delimiter character. The printer must see different characters to work properly. 1. Press the left oval to move to the next digit position. 2. Press the right oval to increase the value of the digit. Default: 2C (comma) Range: 00 to FF
ZPL MODE	Selecting ZPL Mode 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</i> for more information on the differences between ZPL and ZPL II. • Press the right or left oval to display other choices. Default: ZPL II Selections: ZPL II, ZPL

Table 5 • Printer Parameters (Sheet 11 of 15)

Parameter	Action/Explanation
MEDIA POWER UP	Media Power Up This parameter sets the action of the labels when the printer is turned on. - Press the right or left oval to display the choices. Default: Calibration Selections: Feed, Calibration, Length, Short Cal, and No Motion Feed—feeds the labels to the first registration point. Calibration—determines the length of the label and adjusts the sensor settings. Length—In continuous mode, feeds the last stored label length. In non-continuous mode, calibrates based on the maximum label length setting (see Setting Maximum Length on page 46). Short Cal—calibrates label length using the current sensor settings. No Motion—the media does not move. You must press FEED to cause the printer to resynch to the start of the next label.
HEAD CLOSE	Head Close This parameter sets the action of the labels when the printhead is closed. - Press the right or left oval to display the choices. Default: Calibration Selections: Feed, Calibration, Length, Short Cal, and No Motion Feed—feeds the labels to the first registration point. Calibration—determines the length of the label and adjusts the sensor settings. Length—In continuous mode, feeds the last stored label length. In non-continuous mode, calibrates based on the maximum label length setting (see Setting Maximum Length on page 46). Short Cal—calibrates label length using the current sensor settings. No Motion—the media does not move. You must press FEED to cause the printer to resynch to the start of the next label.
BACKFEED	Backfeed Sequence This parameter establishes when and how much label backfeed occurs after a label is removed or cut in Peel-Off, Cutter, and Applicator 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</i>). Note • The difference between the value entered and 100% establishes how much backfeed occurs before the next label prints. 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 prints. A value of BEFORE means that all backfeed takes place before the next label prints. Press the right or left oval to display other choices. Default: DEFAULT (90%) Selections: DEFAULT, AFTER, OFF, BEFORE, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%

Table 5 • Printer Parameters (Sheet 12 of 15)

Parameter	Action/Explanation
LABEL TOP	Adjusting Label Top Position 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). The displayed value represents dots. • To increase the value, press the right oval. • To decrease the value, press the left oval. Default: +0 Range: –120 to +120 dot rows
LEFT POSITION	Adjusting Left Position 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. The displayed value represents dots. 1. Press the left oval to move the cursor. 2. Press the right oval to change between + and to increase the value of the digit. 3. For a negative value, enter the value before changing to the minus sign. Default: 0000 Range: –9999 to +9999
VERIFIER PORT	Setting the Verifier Port The auxiliary port is used to determine how the printer reacts to the online verifier. The three operating conditions for this port are: • OFF: The verifier port is off. • VER-RPRNT ERR: Label reprinted if verifier detects an error. If a bar code is near the upper edge of the label, the label is fed out far enough to be verified and then backfed to allow the next label to print and be verified. • VER-THRUPUT: Allows greatest throughput but may not indicate a verification error immediately upon detection. May print from one to three labels before an error is recognized and printing stops. • Press the right or left oval to display other choices. Default: Off Selections: Off, VER-RPRNT, VER-THRUPUT For more information on the operation of the optional verifier, see the documentation provided with that option.

Table 5 • Printer Parameters (Sheet 13 of 15)

Parameter	Action/Explanation
APPLICATOR PORT	Setting the Applicator Port Determines the action of the verifier port. Note • Set this value as suggested by the applicator manufacturer. • Off: The applicator port is off. • Mode 1: Asserts the ~END_PRINT signal low while the printer is moving the label forward. • Mode 2: Asserts the ~END_PRINT signal high while the printer is moving the label forward. • Mode 3: Asserts the ~END_PRINT signal low for 20 milliseconds when a label has been completed and positioned. Not asserted during continuous printing modes. • Mode 4: Asserts the ~END_PRINT signal high for 20 milliseconds when a label has been completed and positioned. Not asserted during continuous printing modes. • Press the right or left oval to display other choices. Default: Off Selections: Off, mode 1, mode 2, mode 3, mode 4
START PRINT SIG	Start Print Signal This parameter determines how the printer reacts to the Start Print Signal input on pin 3 of the applicator interface connector at the rear of the printer. • In Pulse Mode, labels print when the signal transitions from HIGH to LOW. • In Level Mode, labels print as long as the signal is asserted LOW. Caution • Start Print Signal is set by the applicator manufacturer and should not be changed unless the factory defaults have been reloaded. The printer must be returned to its designated setting for it to work properly. • Press the right or left oval to display other choices. Default: Pulse Mode Selections: Pulse Mode, Level Mode
RESYNCH MODE	Resynch Mode This parameter determines how the printer reacts if the label synchronization is lost and the label top is not where expected. • Feed Mode—If the label top is not where expected, the printer feeds a blank label to find the label top position. • Error Mode—If the label top is not where expected, the printer stops, enters Pause Mode, displays the message Error Condition Feed Label, flashes the ERROR light, and asserts the Service Required signal (pin 10 on the Applicator Interface Connector). To resynch the media to the top of the label in Error Mode, press PAUSE to exit Pause Mode. The ERROR light stops flashing, and the Service Required signal is deactivated. The action of the printer is determined by the Head Close configuration selection (see Head Close on page 54). • Press the right or left oval to toggle between choices. Default: Feed Mode Selections: Feed Mode, Error Mode

Table 5 • Printer Parameters (Sheet 14 of 15)

Parameter	Action/Explanation
WEB S.	These parameters are automatically set during the calibration procedure. They should be changed only by a qualified service technician. See the <i>Maintenance Manual</i> for more information on these parameters. Press NEXT/SAVE to scroll through these parameters.
MEDIA S.	
RIBBON S.	
MARK S.	
TAKE LABEL	
MARK MED S.	
MEDIA LED	
RIBBON LED	
MARK LED	
LCD ADJUST	LCD Adjustment This parameter allows you to adjust the contrast of your LCD if it is difficult to read. - Press the left oval to move the cursor. - Press the right oval to toggle +/- or to increase the value of the digit. Range: 00 to 19
FORMAT CONVERT	Format Convert Selects the bitmap scaling factor. The first number is the original dots per inch (dpi) value; the second, the dpi to which you would like to scale. Note • Not applicable on all printers. Press the right or left oval to display other choices. Default: None Selections: None, 150 → 300, 150 → 600, 200 → 600, 300 → 600
IDLE DISPLAY	Idle Display This parameter selects the LCD options for the real-time clock. Note • If the default value is not selected, pressing either oval briefly displays the firmware version of the printer. Press the right or left oval to display other choices. Default: Firmware version Selections: mm/dd/yy (24 hour), mm/dd/yy (12 hour), dd/mm/yy (24 hour), dd/mm/yy (12 hour)
RTC DATE	RTC (Real-time clock) Date This parameter allows you to set the date following the convention selected in IDLE DISPLAY. - Press the left oval to move to the next digit position. - Press the right oval to increase the value of the digit.

Table 5 • Printer Parameters (Sheet 15 of 15)

Parameter	Action/Explanation
RTC TIME	RTC (Real-time clock) Time This parameter allows you to set the time following the convention selected in IDLE DISPLAY. 1. Press the left oval to move to the next digit position. 2. Press the right oval to increase the value of the digit.
RFID TEST QUICK SLOW	RFID Test In both versions of this test, the printer attempts to read and write to a transponder. In the slow test, the printer also checks the reader version number. If the printer fails the test, the front panel displays an error message. 1. Place an RFID label over the reader (no movement occurs with the test). 2. Press SELECT to select the parameter. 3. Press MINUS (–) to select QUICK. OR Press PLUS (+) to select SLOW. 4. If necessary, press PLUS (+) to select CONTINUE. 5. Press SELECT to deselect the parameter.
RFID TAG TYPE	Detect/Specify RFID Tag Type Default: AUTO DETECT Selections: AUTO DETECT, TAG-IT, ICODE, PICO, ISO15693, EPC, NONE Note • For the RXIIIPlus, leave this parameter set to AUTO DETECT.
RFID ERR STATUS	RFID Error Status If an error condition exists, a message may be displayed here.
LANGUAGE	Selecting the Display Language This parameter allows you to change the language used on the LCD. • Press the right or left oval to display other choices. Default: English Selections: English, Spanish, French, German, Italian, Norwegian, Portuguese, Swedish, Danish, Spanish 2, Dutch, Finnish, Japanese

ZebraNet® Wired Print Server LCD Displays

The menu options shown in Table 6 display only if you have the ZebraNet PrintServer II installed.

Table 6 • Print Server LCD Displays

LCD	Explanation
IP RESOLUTION	IP Resolution Depending on the selection, allows either the user (permanent) or the server (dynamic) to select the IP address. For more information, see the <i>PrintServer II™ Installation and User Guide</i>. Press the right or left oval to display other choices. Default: Dynamic Selections: Dynamic, permanent
IP PROTOCOLS	IP Protocols 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 the <i>PrintServer II™ Installation and User Guide</i>. Press the right or left oval to display other choices. Default: All Selections: All, gleaning only, RARP, BOOTP, DHCP, DHCP/BOOTP
IP ADDRESS	IP Address 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 the <i>PrintServer II™ Installation and User Guide</i>. - Press the left oval to move to the next digit position. - Press the right oval to increase the value of the digit.
SUBNET MASK	Subnet Mask 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. Press the right or left oval to display other choices. Default: Permanent (user must set) Selections: Dynamic (user may set, but server can assign), permanent
DEFAULT GATEWAY	Default Gateway 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. - Press the left oval to move to the next digit position. - Press the right oval to increase the value of the digit.

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