

ZD620 and ZD420

Link-OS 4 inch Desktop Printers



ZEBRA

User Guide

2023/03/23

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About this Guide

This guide is for integrators and operators of Zebra Link-OS ZD620 and ZD420 desktop printers. Use this guide to install, change configuration, operate, and physically support these printers.

Other Online resources are available to support this printer include:

- How-to videos
- ZD620 or ZD420 Desktop Printer product page links for printer specifications
- Printer accessory, supplies, parts, and software links
- Various setup and configuration guides
- Programmer's manuals
- Printer drivers (Windows, Apple, OPOS, etc.)
- Printer firmware
- Printer fonts
- Utilities
- Knowledge base and support contacts
- Printer warranty and repair links

Use these links to get to your online printer support resources:

- ZD620 Thermal Transfer Printer — www.zebra.com/zd620t-info
- ZD620 Direct Thermal Printer — www.zebra.com/zd620d-info
- ZD420 Thermal Transfer Ribbon Cartridge Printer — www.zebra.com/zd420c-info
- ZD420 Thermal Transfer Printer — www.zebra.com/zd420t-info
- ZD420 Direct Thermal Printer — www.zebra.com/zd420d-info

Other Valuable Printer Resources

Zebra has a large suite of free and fee based software, Apps (applications), and other technical resources for your Zebra Link-OS printer.

These are just some of the extensive software and resource areas available online:

- ZebraDesigner label design software
- Printer management tools

- Virtual devices for legacy languages normally associated with other printer brands
- Cloud-based enterprise printer management and printing
- XML and PDF format file printing
- Oracle and SAP support
- Zebra Savanna Data Intelligence platform - turns raw data from devices (IoT) and sensors into actionable intelligence for your business
- A suite of Link-OS Mobile Apps (applications for phones, tablets, etc.)
- Link-OS software development kit (SDK)
- Additional Operating Systems (OS) and Service platforms

For more information, see ZebraLink, Zebra Link-OS, and Zatar here: zebra.com/software

Zebra OneCare Printer Service and Support

For maximum productivity, we can help your business ensure its Zebra printers are Online and ready for business.

For maximum productivity, we can help your business ensure its Zebra printers are Online and ready for business. See the descriptions of the Zebra OneCare service and support options available for your printers Online at this link: zebra.com/zebraonecare

Notational Conventions

The following conventions are used in this document:

- **Bold** text is used to highlight the following:
 - Dialog box, window, and screen names
 - Drop-down list and list box names
 - Checkbox and radio button names
 - Icons on a screen
 - Key names on a keypad
 - Button names on a screen
- Bullets (•) indicate:
 - Action items
 - List of alternatives
 - Lists of required steps that are not necessarily sequential.
- Sequential lists (for example, those that describe step-by-step procedures) appear as numbered lists.

Icon Conventions

The documentation set is designed to give the reader more visual clues. The following graphic icons are used throughout the documentation set. These icons and their associated meanings are described below.



NOTE: The text here indicates information that is supplemental for the user to know and that is not required to complete a task.



IMPORTANT: The text here indicates information that is important for the user to know.



CAUTION—EYE INJURY: Wear protective eyewear when performing certain tasks such as cleaning the inside of a printer.



CAUTION—EYE INJURY: Wear protective eyewear when performing certain tasks such as installing or removing E-rings, C-clips, snap rings, springs, and mounting buttons. These parts are under tension and could fly off.



CAUTION—PRODUCT DAMAGE: If the precaution is not taken, the product could be damaged.



CAUTION: If the precaution is not heeded, the user could receive a minor or moderate injury.



CAUTION—HOT SURFACE: Touching this area could result in burns.



CAUTION—ESD: Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.



CAUTION—ELECTRIC SHOCK: Turn off (O) the device and disconnect it from the power source before performing this task or task step to avoid the risk of electric shock.



WARNING: If danger is not avoided, the user CAN be seriously injured or killed.



DANGER: If danger is not avoided, the user WILL be seriously injured or killed.

Introduction

This section introduces the award winning Zebra Link-OS 4-inch desktop thermal label printers: the ZD620 and ZD420. It has an overview of the Link-OS printer's features and options, and what ships with your new printer.

This guide covers the following ZD-series desktop printer models:

- ZD620 Thermal Transfer Printer — zebra.com/zd620t-info
- ZD620 Direct Thermal Printer — zebra.com/zd620d-info
- ZD420 Thermal Transfer Ribbon Cartridge Printer — zebra.com/zd420c-info
- ZD420 Thermal Transfer Printer — zebra.com/zd420t-info
- ZD420 Direct Thermal Printer — zebra.com/zd420d-info

Link-OS 4 inch Desktop Thermal Printers

The Zebra Link-OS 4 inch Desktop printers are compact label printers with a wide range of features and options.

- Both Direct Thermal and Thermal Transfer printer models are available (along with a Ribbon Cartridge version of the ZD420 Thermal printer).
- ZD420 Healthcare printer models are engineered with plastics that withstand common hospital-cleaning chemicals and ship with a medical-grade power supply.
- ZD620 printers support printing speeds* of:
 - up to 203 mm/s per second (8 ips or inches per second) for 203 dpi (dots per inch print density) printers.
 - up to 152 mm/s (6 ips) for 300 dpi version printers.
- ZD420 printers support printing speeds* of:
 - up to 152 mm per second (6 ips) for 203 dpi printers.
 - up to 102 mm per second (4 ips) for 300 dpi printers.
- The printers covered in this guide support both ZPL and EPL Zebra printer programming languages (as also a wide variety of other printer-control languages when used with Link-OS virtual devices).



NOTE: * Maximum print speeds vary by model, print resolution, and the type of media being used.

Common Desktop Printer Features

Zebra desktop printers share the features listed here.

Table 1 Common Desktop Printer Features

OpenAccess design	To simplify media loading.
Color-coded touch points (for operator controls and media guides) and enhanced user interface featuring three buttons and five status indicators	For ease of using the printer.
Field-installable media handling options	So you can use a variety of media with your printer.
Media roll support	Outer Diameter (O.D.): Up to 127 mm (5 in.) Inner Diameter (I.D.) roll cores: 12.7 mm (0.5 in.), 25.4 mm (1 in.), and additional core sizes when using optional media core adapters
Movable media sensor	Compatibility with a wide range of media types: • Full and partial width black mark media and notched/slotted media. • Multi-center position transmissivity sensor for use with label gap/web media
Modular connectivity slot	For field-installable 10/100 Ethernet (802.3 RJ-45) or Serial (RS-232 DB-9) interface options.
Font support	On-the-fly OpenType and TrueType font scaling and import. Unicode Resident scalable font (Swiss 721 Latin 1 font) Selection of resident bitmap fonts
Backwards-compatibility focused technology	For quick printer replacements: • Drop-in replacement of legacy Zebra desktop printers. • Support for EPL and ZPL programming language instructions. • Support for Link-OS virtual devices to interpret non-Zebra printer programming language code.
Universal Serial Bus (USB) 2.0 interface	To enable convenient connectivity and quick file transfers.
Universal Serial Bus (USB) host port	To speed up print operations (ex., printer firmware updates).

Table 1 Common Desktop Printer Features (Continued)

Factory-installed network models	Supports printer configuration using a setup utility running on mobile devices. • Use the printer's optional Bluetooth Low Energy (LE) feature for short-range communication to a variety of mobile devices. Bluetooth LE works with Zebra mobile setup utility applications to assist in printer setup, perform media calibration, and maximize print quality. • Tap to pair devices with the printer, access printer information, and use mobile applications using Zebra's Print Touch (Near Field Communication or NFC).
Zebra's Link-OS	An open platform which connects operating systems for smart Zebra devices with powerful software apps, allowing for quick integration, management, and maintenance from any location.
On-board Real Time Clock (RTC)	For internal printer timekeeping.
XML-enabled printing	For barcode label printing; lowers license fees and print server hardware requirements, thereby reducing customization and programming costs.
Zebra global printing solution	Supports the following: • Microsoft Windows keyboard encoding (and ANSI), Unicode UTF-8 and UTF-16 (Unicode Transformation Formats) • XML • ASCII (7-bit and 8-bit used by legacy programs and systems) • Basic single- and double-byte font encoding • Hexadecimal encoding • JIS and Shift-JIS (Japanese International Standards) • Custom character mapping (DAT table creation, font linking, and character remapping)
Printhead maintenance reporting	Can be enabled and customized by the user or operator.
Tool-free replacement	For printheads and platen (drive) rollers.
Minimum of 64 MB of internal (E : \) printer memory	To store forms, fonts, and graphics.

Link-OS 4 inch Desktop Printer Options

The ZD620 and ZD420 printer models listed in this guide are Link-OS 4 inch desktop printers.

Table 2 Options Available with Link-OS 4 inch Desktop Printers

Color LCD user interface	For easy setup, print configuration, printing, and a range of Link-OS features.
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Table 2 Options Available with Link-OS 4 inch Desktop Printers (Continued)

For healthcare models: • Easy-wipe plastic surfaces • IEC 60601-1 (medical electronics standard) certified power supply	So you can disinfect and clean the printers easily if they are used in a healthcare system environment like hospitals or clinics.
Locking media cabinet (available on ZD620 Direct Thermal Healthcare printer models)	For additional security, a Kensington slot for Kensington locking devices, to secure the printer.
Factory-installed wired and wireless options	Wi-Fi (802.11ac – includes a/b/g/n), Bluetooth Classic 4.X (3.X compatible), and Bluetooth Low Energy (LE) wireless connectivity.
	Internal Ethernet print server (with external, LAN RJ-45 connector)—Supports 10Base-T, 100Base-TX, and fast Ethernet 10/100 auto-switching networks for wired connectivity; the factory-installed option includes Bluetooth Low Energy (LE) wireless connectivity.
Thermal transfer printing	A choice of easy-loading thermal transfer ribbon cartridge or dual-capacity ribbon roll (74-meter and 300-meter) models.
Factory-installed On-Board Real Time Clock (RTC)	On ZD620 and select ZD420 printers that have Bluetooth Low Power (BTLE) or Wi-Fi with Classic Bluetooth configurations.
Field-installable connectivity modules • Internal Ethernet Print Server (LAN, RJ-45 connector) • Serial port (RS-232 DB-9)	The internal Ethernet Print Server supports 10Base-T, 100Base-TX and fast Ethernet 10/100 auto-switching networks.
Field installable media handling options	• Label dispenser (peels the liner off the label and dispenses the label) • General purpose media cutter • Linerless label tear-off printing with a label-taken sensor • Linerless label cutter with a label-taken sensor
Media core adapter kit	Includes adapters for media rolls with Outer Diameters (O.D.s) up to 127 mm (5 in.) and: • 38.1 mm (1.5 in.) I.D. media cores • 50.8 mm (2.0 in.) I.D. media cores • 76.2 mm (3.0 in.) I.D. media cores
Attached power supply base	With internal power supply.

Table 2 Options Available with Link-OS 4 inch Desktop Printers (Continued)

Attached battery base	With removable battery. • The battery base and the battery are sold separately. • The battery provides a constant regulated 24 VDC (until the battery shuts down for recharging) to maintain print quality. This keeps print from changing as the battery discharges with use. • Includes a shutdown mode for shipping and storage. • Includes battery charge and status indicators built into the battery.
Tool-less field upgrade kit	To change the printer resolution: • from 203 dpi to 300 dpi printing capability, or • from 300 dpi to 203 dpi printing capability.
Asian language support	Features printer configuration options for the large Simplified and Traditional Chinese, Japanese, or Korean character sets.
Support for Zebra ZBI 2.0 (Zebra BASIC Interpreter) programming language	Allows you to automate print-operation processes and use peripherals (i.e. scanners, scales, keyboards, Zebra Keyboard Display Unit or ZKDU, and others) without having the printer connected to a PC or network.

What You Will Need to Print

Your printer is one of three parts of your printing solution. To print, you will also need print media and software.

The printer can operate in standalone mode. It does not have to be connected to other devices or systems to print.

Table 3 Supplies, Drivers and Applications You Will Need to Print

Compatible media	You can use thermal transfer ribbon rolls along with thermal transfer media, or direct thermal media, with this printer. Media may be labels, tags, tickets, receipt paper, fanfold stacks, tamper-proof labels, etc. depending on your printing needs. Use information from zebra.com/supplies or from your reseller to identify and procure media for your specific use
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Table 3 Supplies, Drivers and Applications You Will Need to Print (Continued)

Software • Printer drivers • Printer programming utilities • Applications (such as for label design)	Zebra provides a complete suite of free Link-OS software applications and drivers to configure printer settings, print labels and receipts, get printer status, import graphics and fonts, send programming commands, update firmware, and download files. Use these drivers and applications to configure and manage your printer and your print jobs from a central device such as a PC or laptop. For information on installing the drivers, see Installing the Windows Printer Drivers on page 146. You can use ZebraDesigner—a free application for Windows PC operating systems—to design simple labels and forms. ZebraDesigner is available to download from zebra.com/zebradesigner.
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Modes of Printing

Depending on your printer type, model and options, it may support one or more of these modes and media configurations.

Table 4 Print Modes

Mode	Description
Direct Thermal printing	Uses heat-sensitive media to print. When setting this mode, use media that supports this mode of printing. See Determining Thermal Media Types on page 288.)
Thermal Transfer printing	Requires ribbon rolls or a thermal transfer ribbon cartridge to print. While printing, heat and pressure transfer ink from the ribbon to the media. When using Thermal Transfer printing, be sure to use thermal transfer media. See Determining Thermal Media Types on page 288.)
Standard tear-off mode	Allows you to tear off each label or to batch-print a strip of labels and tear them off after the printer has printed the label(s).
Label dispense mode	If your printer has the optional factory-installed label dispenser, the dispenser automatically peels away the backing material from a label as it is being printed before it prints the next label.
Media cutting mode	If your printer has the optional, factory-installed media cutter, the printer cuts the label liner between the labels, the receipt paper, or the tag stock.
Linerless media printing	In linerless printing, the printer can use either cut or tear-off label options for easy pick-and-place label applications.

Table 4 Print Modes (Continued)

Mode	Description
Standalone operation (printer operates on its own without a live network connection)	The printer can print an auto-running label format or form (programming based) without being actively connected to another device such as a computer. - On printers with the color LCD display option, you can use menus to access and print a label format or form. - You can use a Link-OS app, connecting to the printer using the Bluetooth (wireless) option. - A data input device connected to the printer's USB Host port or serial port. This mode accommodates data-input devices such as scanners, weighing scales, or Zebra Keyboard Display Units (ZKDUs).
Shared network printing mode	Printers configured with factory-installed Ethernet (LAN) and Wi-Fi (WLAN) interface options ship with an internal print server to enable wired and wireless networking.

Unpacking and Inspecting the Printer

When you receive the printer, immediately unpack it and inspect for shipping damage. Also make sure the package includes all the parts.

See the Zebra ZD620/ ZD420 printer support resources pages for videos on how to pack and unpack your printer. The [About this Guide](#) on page 11 section includes links to the support pages.

1. Save all packing materials.
2. Check all exterior surfaces for damage.
3. Open the printer and inspect the media compartment for loose or damaged components. See [Opening Your Printer](#) on page 21.
4. If you discover shipping damage on inspecting the printer:
 - a) Immediately notify the shipping company and file a damage report.



NOTE: Zebra Technologies Corporation is not responsible for any damage to the printer incurred during shipment, and will not cover the repair of this damage under its warranty policy.

- b) Keep all packaging material for shipping-company inspection.
- c) Notify your authorized Zebra reseller promptly.

To make sure your package includes all the standard parts, see [What's in the Box?](#) on page 21.

What's in the Box?

After unpacking and inspecting the printer, make sure you have all the parts listed here. Familiarize yourself with the printer hardware so you can follow the instructions in this guide.

 Printer	 USB cable	 Printer documentation
 Power supply		
 Empty starter ribbon cores (included only with thermal transfer printer models)	 Non-Zebra 300-meter ribbon adapters (included only with thermal transfer printer models)	

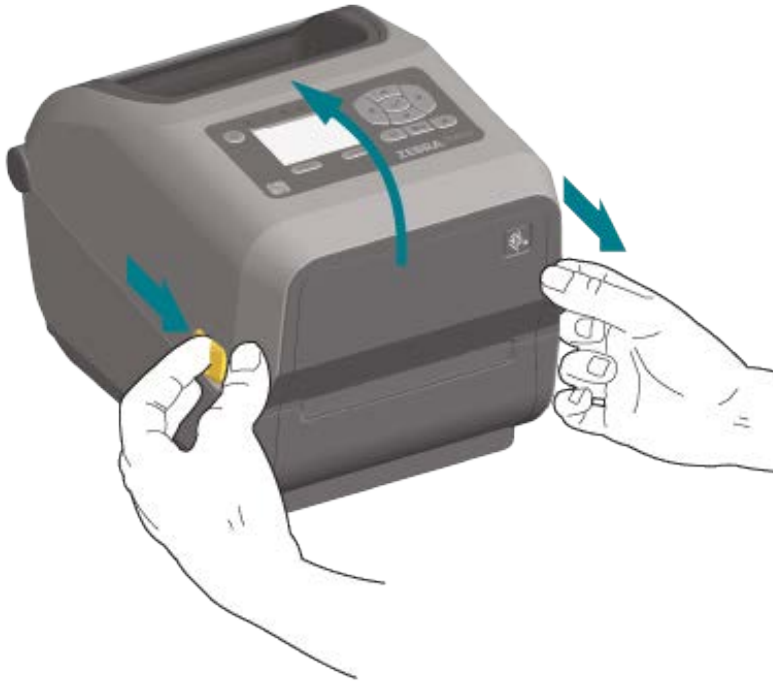
Opening Your Printer

Use this procedure to open the media compartment, inspect and clean the interior periodically, load printing supplies, and replace those parts as necessary that are operator-replaceable.

Pull the release latches towards you and lift the cover.



NOTE: If this is the first time you are opening the printer after receiving it, check the media compartment for loose or damaged components.



CAUTION: The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead and other electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components under the top cover.

Closing Your Printer

1. Lower the top cover.
2. Press down in the middle of the cover in front until the cover snaps closed.



Printer Features

This section will help you identify features of these Zebra Link-OS 4-inch desktop thermal label printers, the ZD620 and ZD420.

To better familiarize yourself with the features of the printers, see the printer features video and the other how-to videos on the Zebra web site at these links:

- ZD620 Thermal Transfer Printer — zebra.com/zd620t-info
- ZD620 Direct Thermal Printer — zebra.com/zd620d-info
- ZD420 Thermal Transfer Ribbon Cartridge Printer — zebra.com/zd420c-info
- ZD420 Thermal Transfer Printer — zebra.com/zd420t-info
- ZD420 Direct Thermal Printer — zebra.com/zd420d-info

The general exterior features for this printer series are shown here. For detailed information on the printer user interface controls, see [Controls and Indicators](#) on page 55.



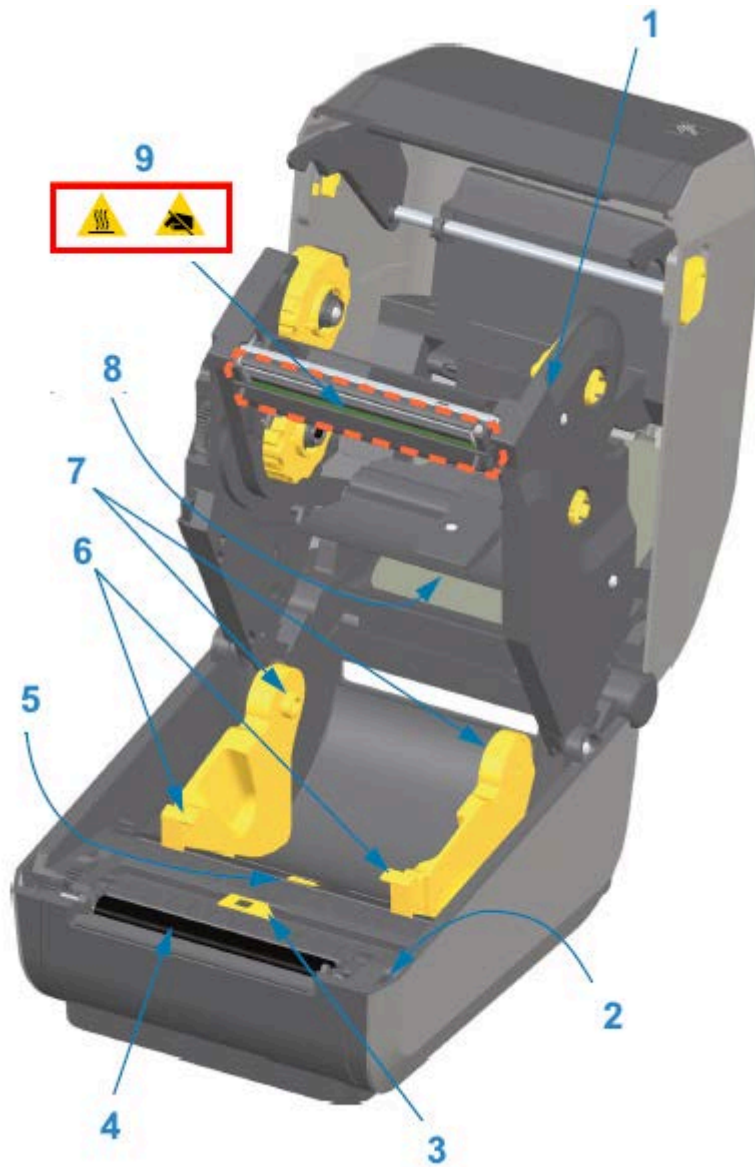
1	User interface
2	Release latch

Printer Features



1	Power button
2	Fanfold media entry slot
3	Interface and connectivity module slot access
4	DC power receptacle
5	Release latch

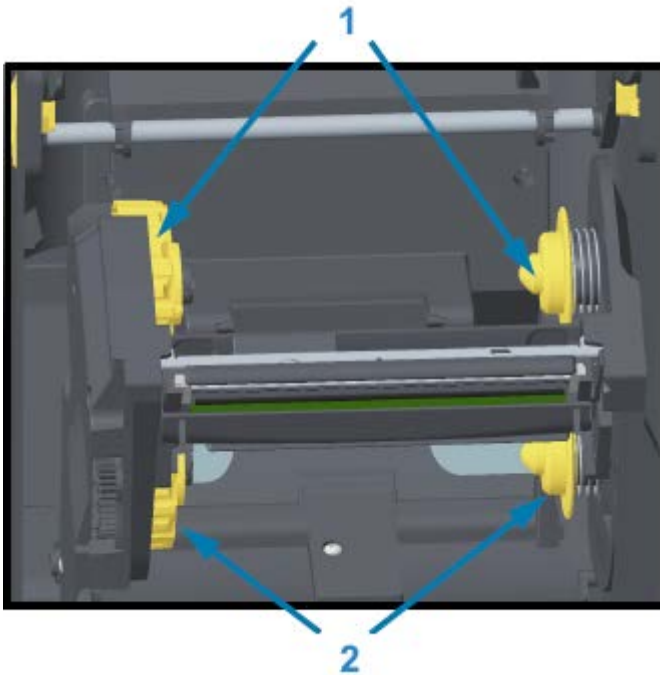
Inside the ZD620 Dual Capacity Ribbon Roll Printer



1	Ribbon cartridge
2	Head-up sensor (inside)
3	Movable sensor (black mark and lower web/gap)
4	Platen (drive) roller
5	Media guide stop adjustment
6	Media guides
7	Roll holders
8	Upper web (gap) array sensor (other side)

9	Printhead
---	-----------

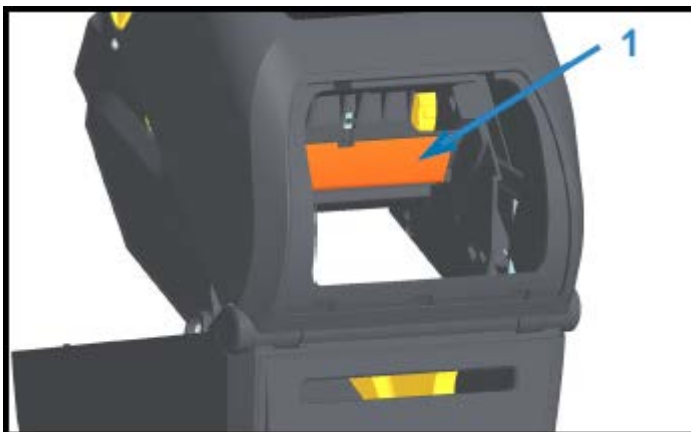
Dual Capacity Ribbon Chassis – Ribbon Roll Holders



1	Ribbon take-up spindles
2	Supply spindles (full ribbon rolls)

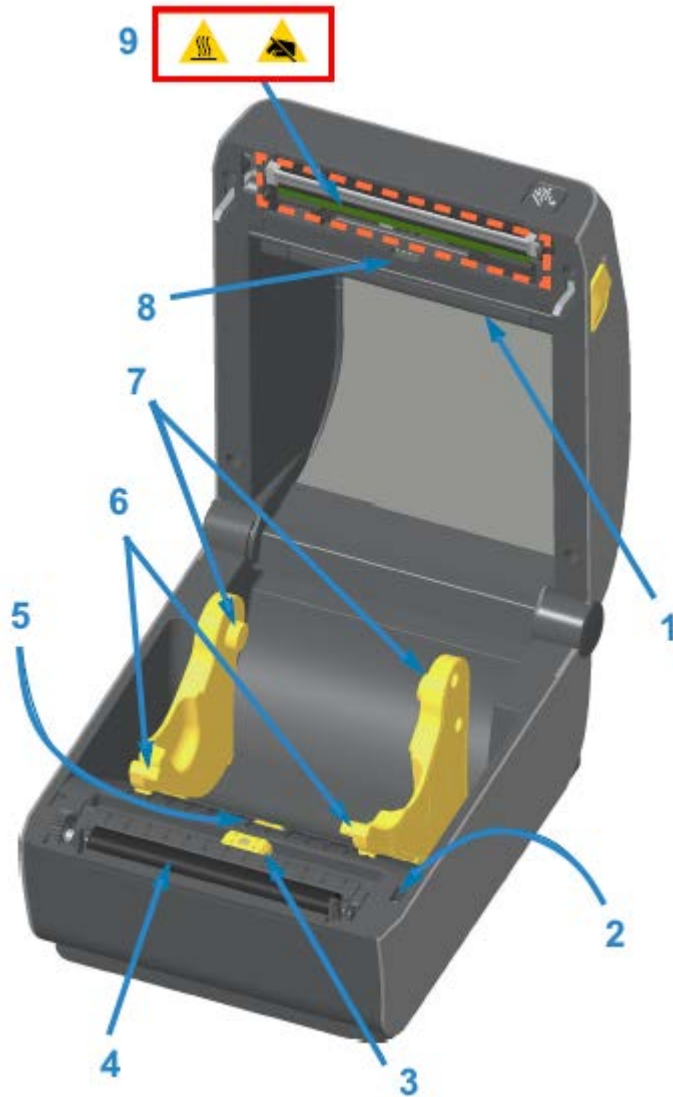
Media Dancer – ZD620 Printer Models Only

In this image, the printer window is removed to show the media dancer (plate). The media dancer is re-colored to make it easier to see. It is the same color as the dark gray parts adjacent to it.



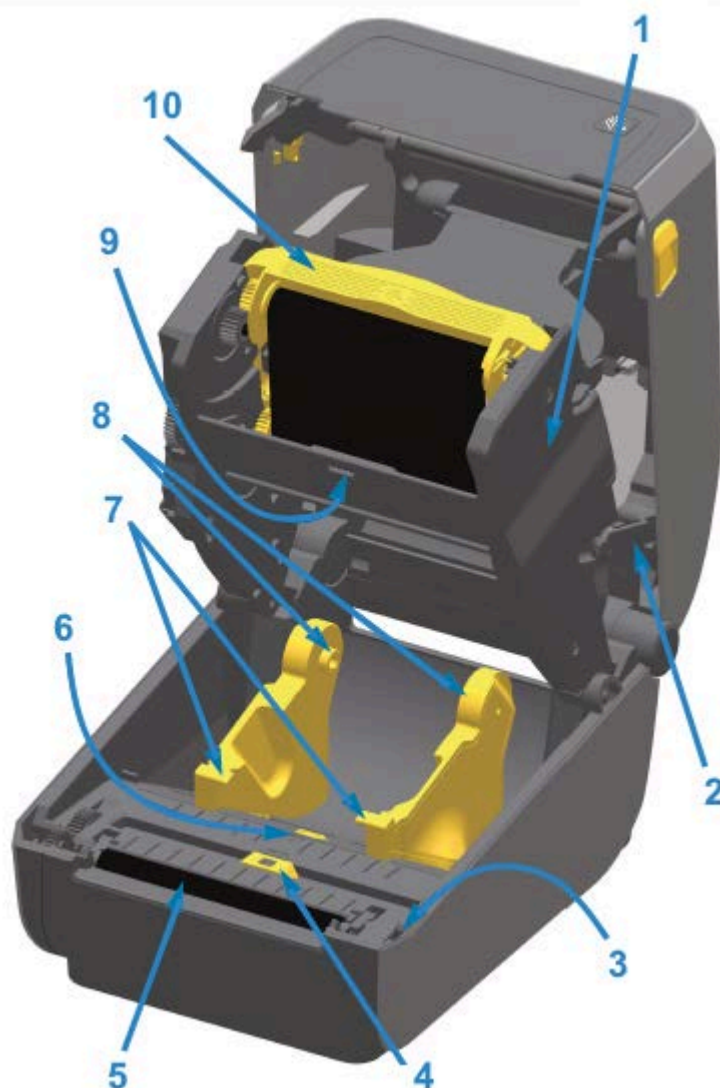
1	Media dancer (ZD620 only)
---	---------------------------

Inside the ZD620 and ZD420 Direct Thermal Printers



1	Media dancer (ZD620 only)
2	Head-up sensor
3	Movable sensor (black mark and lower web/gap)
4	Platen (drive) roller
5	Media guide stop adjustment
6	Media guides
7	Roll holders
8	Upper web(gap) array sensor
9	Printhead

Inside the ZD420 Ribbon Cartridge Printer

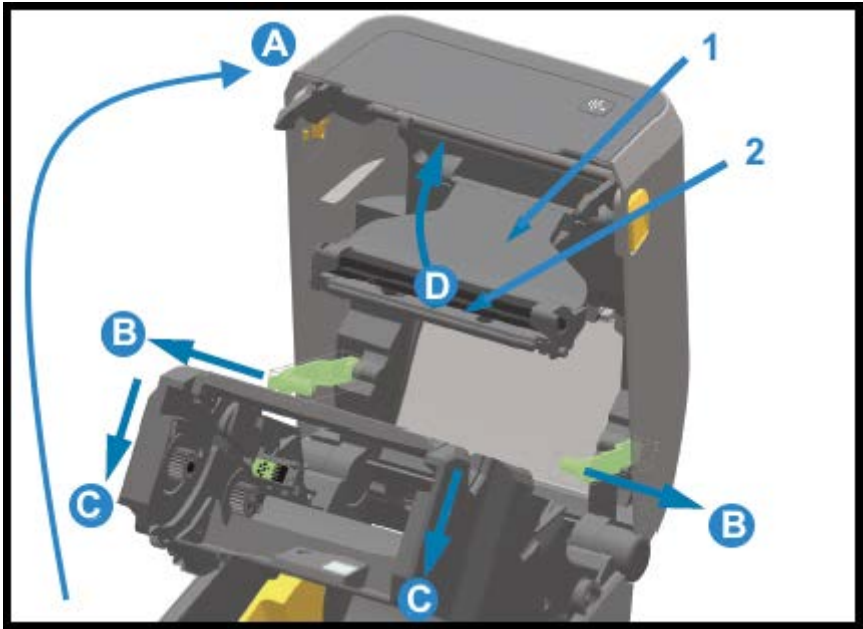


1	Ribbon drive transport
2	Release arms (2)
3	Head-up sensor (inside)
4	Movable sensor (black mark and lower web/gap)
5	Platen (drive) roller
6	Media guide stop adjustment
7	Media guides
8	Roll holders
9	Upper web (gap) array sensor

10	Ribbon cartridge (sold separately and shown installed)
----	--

Accessing the Printhead of the Ribbon Cartridge Printer

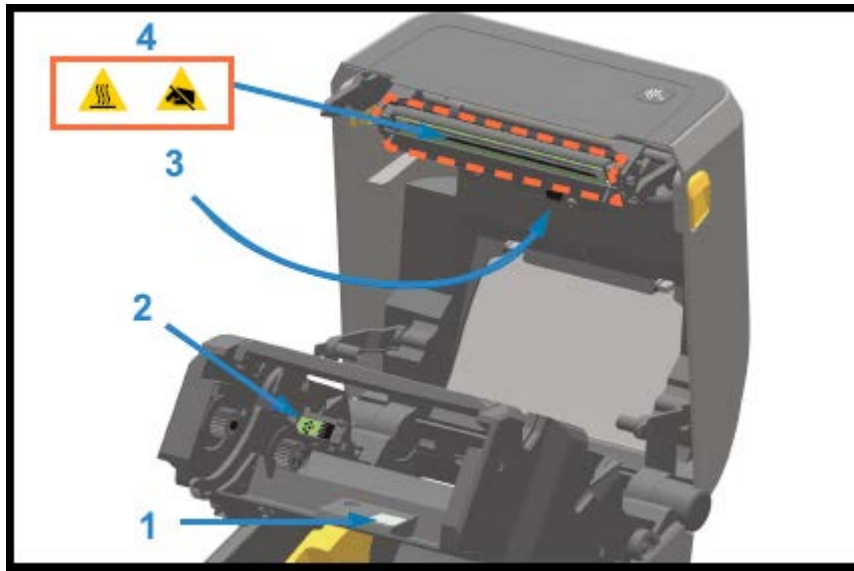
- 1. Open the printer cover (A).
- 2. Pull both release arms out (black parts highlighted green in this image) (B).



1	Printhead actuator arm
2	Back of printhead

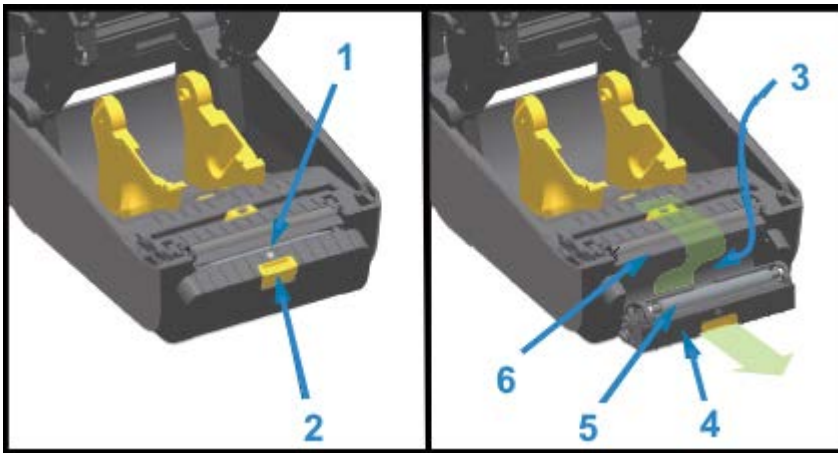
The ribbon drive transport drops down (C).

3. Lift the printhead actuator arm (1) up (D) to access the printhead (2).



1	Ribbon sensor's reflector
2	Ribbon cartridge authentication and status interface
3	Ribbon sensor
4	Printhead

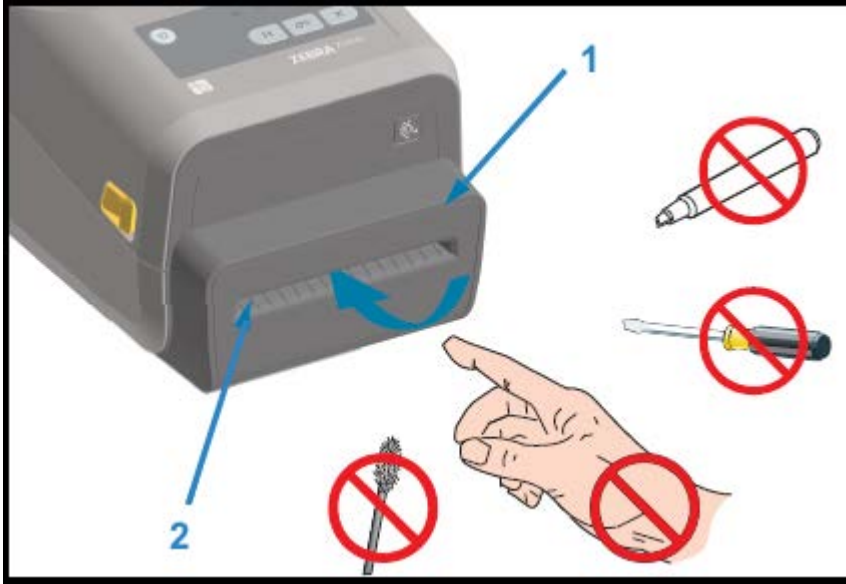
Label Dispenser Option (field installable) – All Models



1	Label-taken sensor
2	Door latch
3	Label liner exit area
4	Dispenser door
5	Peel roll

6	Media exit slot
---	-----------------

Cutter Option (field installable) – All Models



1	Cutter module
2	Media exit slot

Linerless Media Tear-Off Option – Direct Thermal Models Only



1	Label-taken sensor
---	--------------------

Linerless Cutter Option (Direct Thermal Models Only)



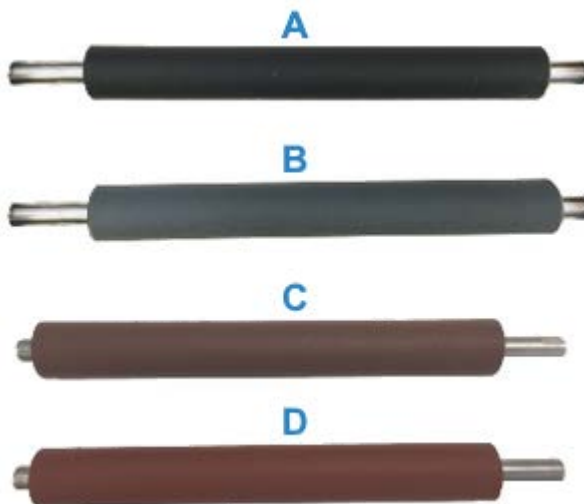
1	Label-taken sensor
2	Cut label landing area

Identifying Platen Drive Rollers Types

The platen (drive) rollers are colored differently to identify the platen type and print resolution of your printer (and the platen).



NOTE: Do NOT exchange platen types unless you are specifically instructed to do so either by an upgrade procedure or by Zebra Technical Support. If incorrect platens are used, the printer will stop operating properly, and this may cause a variety of problems that would require maintenance.



A	203 dpi standard platen (black)
B	300 dpi standard platen (gray)
C	203 dpi linerless platen (reddish-brown)
C	300 dpi linerless platen (brown)

Printer Power Supply Options

ZD-Series printers offer field-installable, attached power options, namely, an attached power supply base or a battery power base. These options easily attach with screws and replace the power supply that was included with your printer.

Attached Power Supply Base



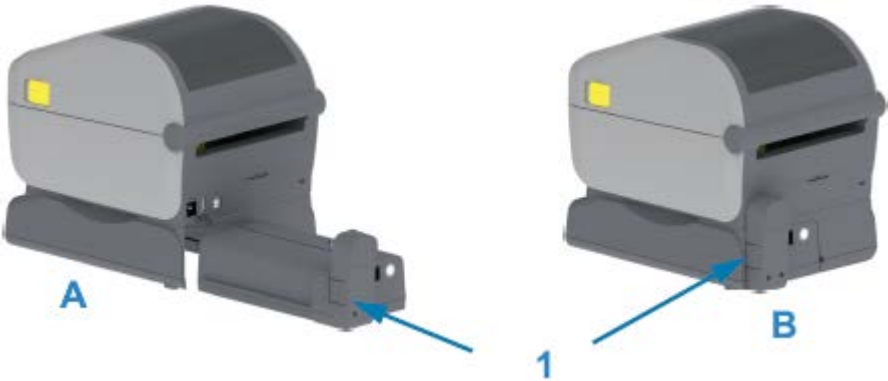
1	Attached power supply base
---	----------------------------

Attached Battery Base and Battery



1	Battery status and charge indicators
2	Battery power base
3	Power interface
4	Power input
5	Battery control button

The following image shows the printer with the battery ready to install (A) and the printer with the battery installed (B).



1	Battery latch
---	---------------

ZD620 Locking Printer Features

This option is available only in healthcare printer models. It includes lock-and-key access to the printer's media compartment and a Kensington lock slot on the printer's back panel to secure it if needed.



1	Kensington lock slot
2	Cabinet lock

Zebra Print Touch for Near-Field Communication (NFC)

The Zebra Print Touch feature allows you to touch an Android-based, Near Field Communication (NFC)-enabled device such as a smart phone or tablet to the printer's Print Touch logo to pair the device to the printer.

Zebra Print Touch is available on Zebra printer models with factory-installed networking (Wi-Fi, wired Ethernet, Bluetooth, and Bluetooth Low Power). The Print Touch feature allows you to use your mobile device to provide information for which you are prompted and then print a label using that information.

This image shows Print Touch (passive NFC) location on your printer.



IMPORTANT: Some mobile devices may not support NFC communication with the printer until you configure the required NFC settings in your device. If you encounter difficulties, consult your service provider or your smart device manufacturer for more information.

Data encoded into the tag includes:

- a URL for a Zebra QuickHelp style support web page
- the printer's unique Bluetooth Low Energy MAC address
- the printer's Bluetooth Classic MAC address (if present)
- the printer's Wi-Fi (WLAN) MAC address (if present)
- the printer's Ethernet (LAN) MAC address (if present)
- the printer SKU (ex., ZD42022-D01W01EZ)
- the printer's unique serial number

The NFC tag can be used to:

- pair with a compatible mobile device using Bluetooth.
- launch an application.
- launch a mobile browser to a web page.

Install Hardware Options

This section assists you installing common printer connectivity modules and media handling options.



IMPORTANT: To simplify and speed up the setup process, install all connectivity modules and media handling options before setting up and using your printer for the first time.



IMPORTANT: Zebra strongly recommends that you update your printer's firmware after the printer has completed the setup process. (See [Updating Printer Firmware](#) on page 230). Many of these options have internal firmware that require an update to operate properly with the printer's main logic board's installed firmware version.

Field-Installable Printer Accessories and Options

This section lists the accessories and options available for the printer models covered in this guide.

Printer Connectivity Modules

The connectivity module's access door must be removed prior to installing the following options. See [Accessing the Connectivity Module Slot](#) on page 38.

- ZD420 Serial Port — [Installing the Serial Port Module](#) on page 39
 - RS-232 DB-9 connector with DTE/DTC auto-switching — [Serial Port Interface](#) on page 261
- ZD420 Internal Ethernet (wired LAN) — [Installing the Internal Ethernet \(LAN\) Module](#) on page 40
 - RJ-45 connector
 - Fast Ethernet 10/100 auto-switching, 10Base-T, and 100Base-TX networks

Media Handling Options

The printer's standard bezel must be removed prior to installing the following options — [Removing the Standard Bezel](#) on page 42.

- Label Dispenser (automatically peels liner off labels and dispenses the labels) — [Installing the Label Dispenser](#) on page 43
- General Purpose Media Cutter — [Installing the Standard Media Cutter](#) on page 44
- Linerless Media Cutter — [Installing the Linerless Media Cutter](#) on page 45
- Linerless Media 'Tear-Off' Label Bezel — [Installing the Linerless Media Tear-Off Bezel](#) on page 46
- Printer Resolution Upgrade Kits (203 dpi and 300 dpi) — [Print Resolution Upgrade Kits](#) on page 49

- Media Roll Adapters for 38.1 mm (1.5 in.), 50.8 mm (2.0 in.), or 76.2 mm (3.0 in.) I.D. media cores — [Media Roll Core Size Adapters](#) on page 47

Power Base Options

The ZD Series (ZD620 and ZD420) printers are supported with power base field upgrade kits for each the direct thermal and thermal transfer versions of these printers.

- Attached Power Supply Base (power supply included) — [Installing the Attached Power Supply Base Options](#) on page 50
- Battery Power Base (battery pack sold separately) — [Installing the Attached Battery Base Options](#) on page 52
- Battery Pack (battery power base sold separately) — [Installing the Battery into the Attached Power Base](#) on page 53

Printer Connectivity Modules

The connectivity modules are easily installable without the use of tools.

Power Failure Recovery Mode Jumper (OFF by Default)



CAUTION: The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components.

All printer connectivity modules have a power failure recovery jumper that is set to the OFF position by default. When the jumper is set to ON, the printer automatically powers ON when plugged into an active (ON) AC power source. See Power Button — Power Failure Recovery Mode in [Standard Interface Controls](#) on page 56 for power ON/OFF behaviors. See [Setting the Power Failure Recovery Mode Jumper](#) on page 187 for instructions on activating this mode.



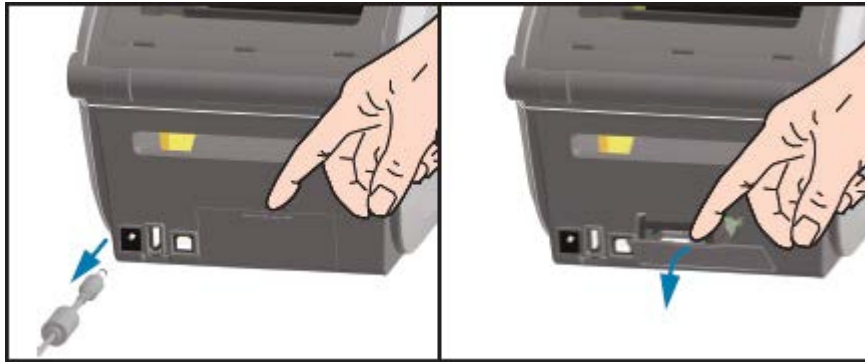
NOTE: The Power Failure Recovery Mode is available ONLY on printers that have a Printer Connectivity Module installed.

Accessing the Connectivity Module Slot

1. Disconnect the DC power plug from the rear of the printer.
2. Open the module access door by pushing down on the top of the door with your fingertip.

This releases the latch.

3. Pull the door away from the printer and down to remove.



Installing the Serial Port Module

1. With the DC power plug and module's access door removed, slide the serial port module into the printer. Push the circuit card in slowly but firmly until the card is just past the inside lip of the access door.



2. Align the bottom of the serial port's door cover to the bottom lip of the module access opening. Swing the door up and snap the cover closed.



1	Serial Port (RS-232)
---	----------------------



NOTE: For best printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#) on page 230.

Installing the Internal Ethernet (LAN) Module

1. With the DC power plug and module's access door removed, slide the Ethernet module into the printer. Push the circuit card in slowly but firmly until the card is just past the inside lip of the access door.



2. Align the bottom of the Ethernet port's door cover to the bottom lip of the module access opening, then swing the door up and snap the cover closed.



1	Ethernet port (RJ-45)
---	-----------------------



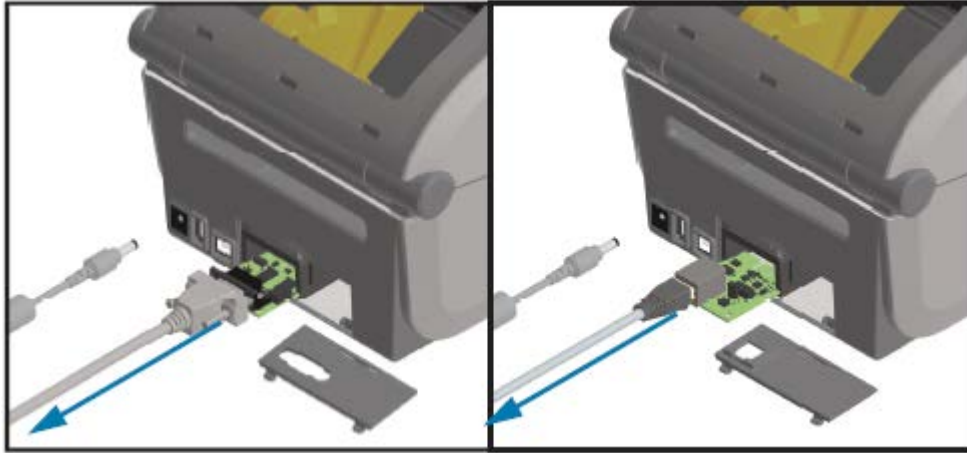
NOTE: For best printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#) on page 230.

Removing the Printer Connectivity Modules

Connectivity modules can easily be removed when reconfiguring the printer with options or as part of printer repair. They should not, however, be removed and replaced as a general practice.

1. Remove the interface cable (Ethernet or Serial).
2. Remove the module access door. Push down on the top of the door with your finger tip.
This releases the latch.
3. Pull the door away and down to remove.
4. Re-attach the interface cable to the connectivity module and secure the cable.
5. Gently pull on the interface cable that is secured to the connectivity module. Slowly pull the module out of the printer.

6. Install a different connectivity module or re-install the connectivity module's access door. Align it to the bottom lip of the access opening and swing it up to snap and lock in place.



Media Handling Options

This section describes the various media handling options.



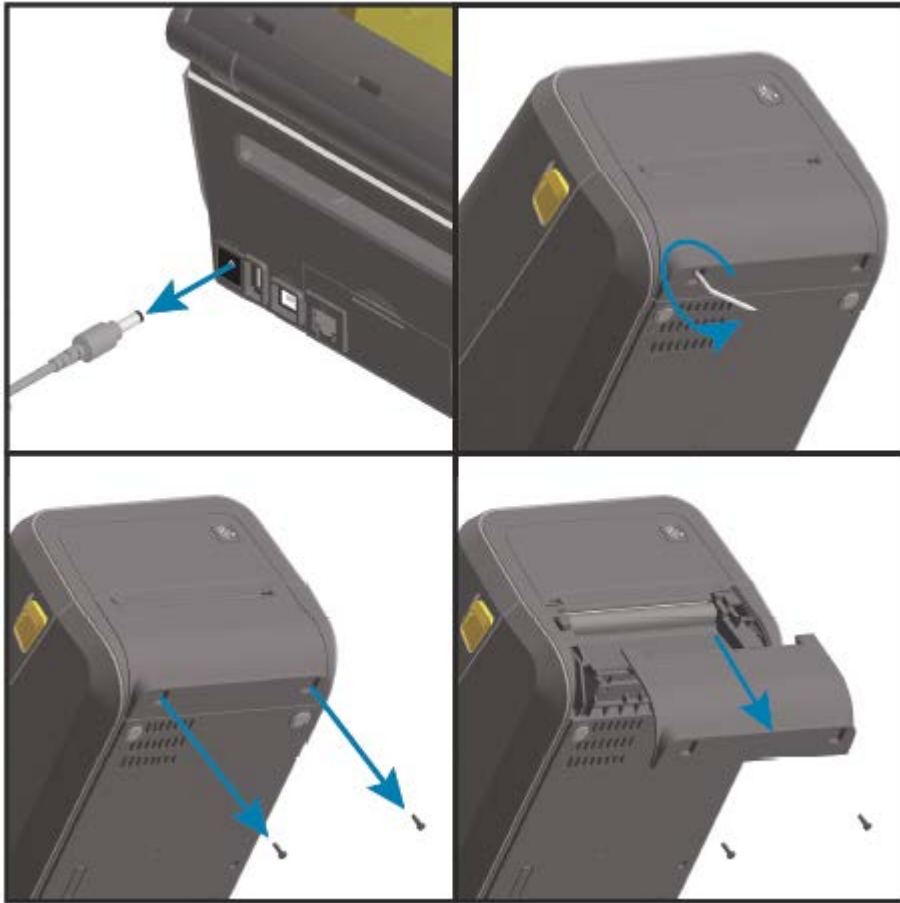
CAUTION: The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components.

Removing the Standard Bezel

Use this procedure to remove the standard bezel before mounting your media-handling option.

1. Disconnect the printer's DC power input plug from the rear of the printer.
2. Turn the printer upside down. Remove the two mounting screws with the supplied Torx wrench. Save the screws.

3. Slide the bezel down the front about 12.5 mm (0.5 in.) and pull the loose bezel out.

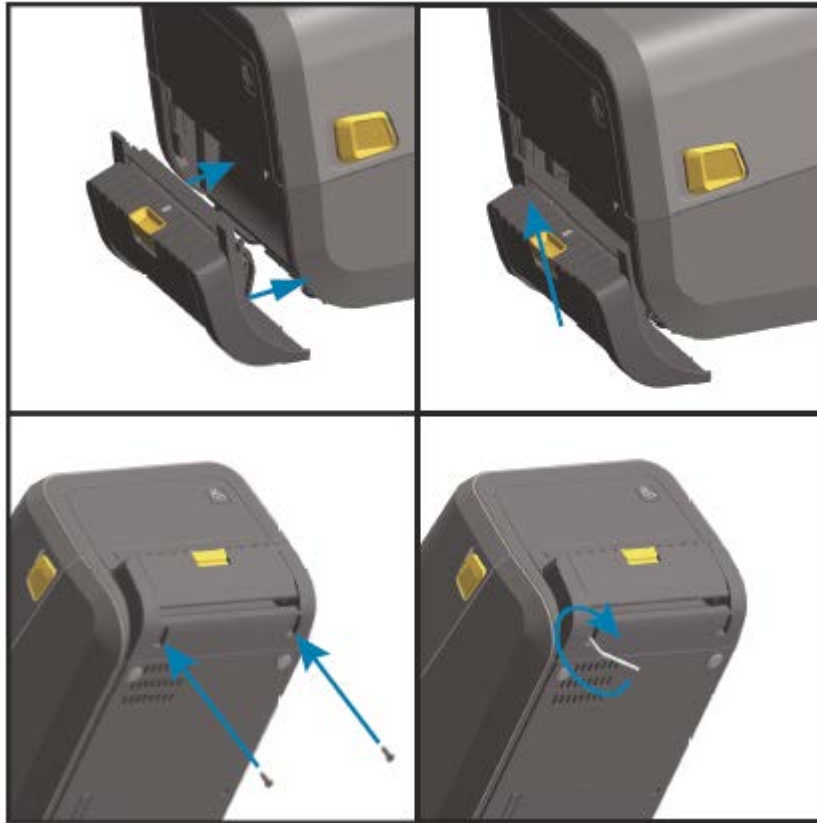


Installing the Label Dispenser

To install the label dispenser, you must remove the standard bezel and disconnect DC input power to the printer. See [Removing the Standard Bezel](#) on page 42.

1. Place the label dispenser module and printer right side up with the top of the module 12.5 mm (0.5 in.) below the bottom of the top cover. Center and push the module into the front of the printer and slide it up until it stops.

2. Turn the printer upside down and attach the module to the printer with the two screws using the Torx wrench.



NOTE: For optimal printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#) on page 230.

Installing the Standard Media Cutter

To install the standard media cutter, you must remove the standard bezel and disconnect DC input power to the printer. See [Removing the Standard Bezel](#) on page 42.



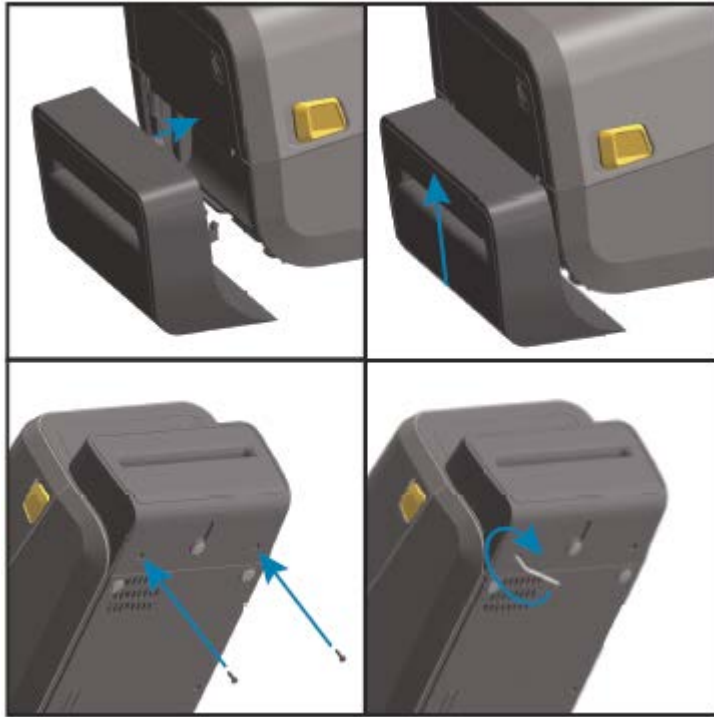
CAUTION: There are no operator serviceable parts in the cutter unit. Never remove the cutter cover (bezel). Never attempt to insert objects or fingers in to the cutter mechanism.



IMPORTANT: Using unapproved tools, cotton swabs, solvents, etc. may damage or shorten the cutter's usable life or cause the cutter to bind.

1. Place the cutter module and printer right side up with the top of the module even with the bottom of the top cover. Center and push the module into the front of the printer and slide it up until it stops.

2. Turn the printer upside down and attach the module to the printer with the two screws using the Torx wrench.



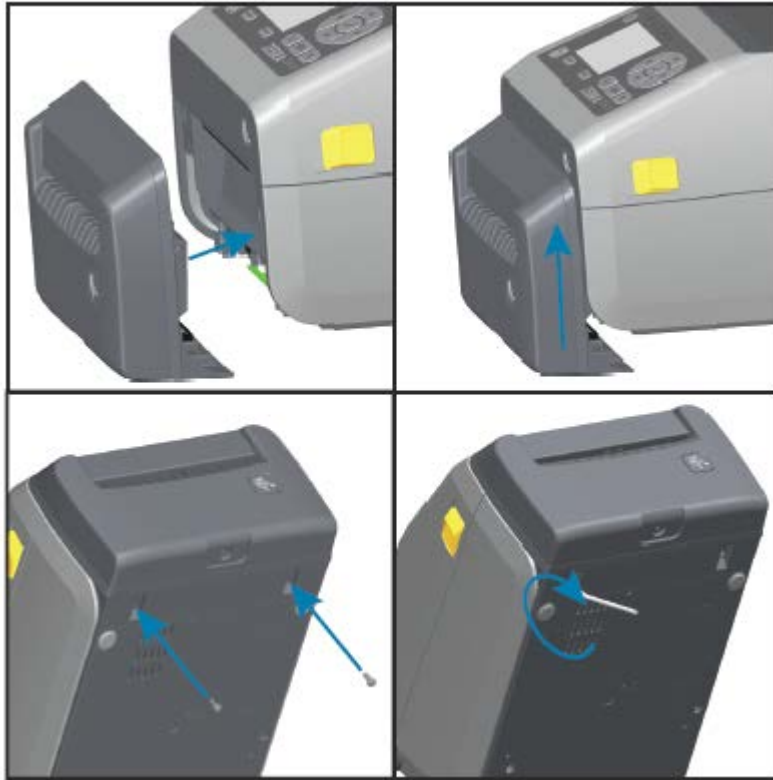
NOTE: For optimal printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#) on page 230.

Installing the Linerless Media Cutter

To install the linerless media cutter, you must remove the standard bezel and disconnect DC input power to the printer. See [Removing the Standard Bezel](#) on page 42.

1. Open the printer, remove the standard platen roller, and replace it with the linerless platen roller. See [Cleaning and Replacing the Platen](#) on page 213. For a list of compatible platen rollers, see [Installing the Printhead Resolution Upgrade Kits](#) on page 50.
2. Place the cutter module and printer right side up with the top of the module even with the bottom of the top cover. Center and push the module into the front of the printer and slide it up until it stops.

3. Turn the printer upside down and attach the module to the printer with the two screws using the Torx wrench.



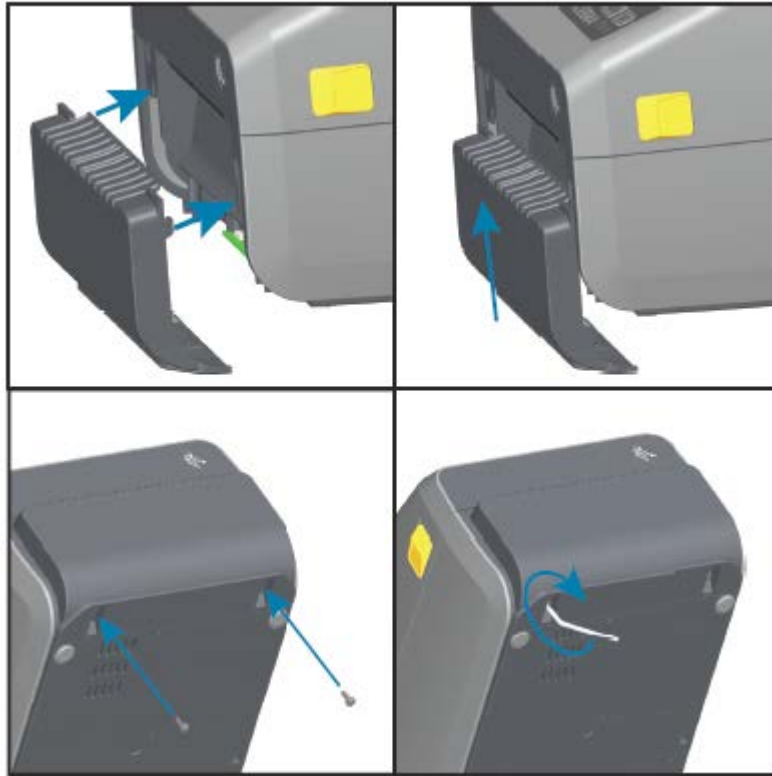
NOTE: For optimal printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#) on page 230.

Installing the Linerless Media Tear-Off Bezel

To install the standard media cutter, you must remove the standard bezel and disconnect DC input power to the printer. See [Removing the Standard Bezel](#) on page 42.

1. Open the printer, remove the standard platen roller, and replace it with the linerless platen roller. See [Cleaning and Replacing the Platen](#) on page 213. For a list of compatible platen rollers, [Installing the Printhead Resolution Upgrade Kits](#) on page 50.
2. Place the tear-off bezel module and printer right side up, with the top of the module even with the bottom of the top cover. Center and push the module into the front of the printer and slide it up until it stops.

3. Turn the printer upside down and attach the module to the printer with the two screws using the Torx wrench.



NOTE: For optimal printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#) on page 230.

Media Roll Core Size Adapters

The media roll adapters kit includes three pairs of media roll adapters. The kits are for the following inner diameter (I.D.) media cores:

- 38.1 mm (1.5 in.)
- 50.8 mm (2.0 in.)
- 76.2 mm (3.0 in.)

The adapters are intended to be permanently installed in the printer. You can replace them as needed to support other media roll sizes that require one of these adapter sizes.



IMPORTANT: The adapters may wear out if they are changed too much.



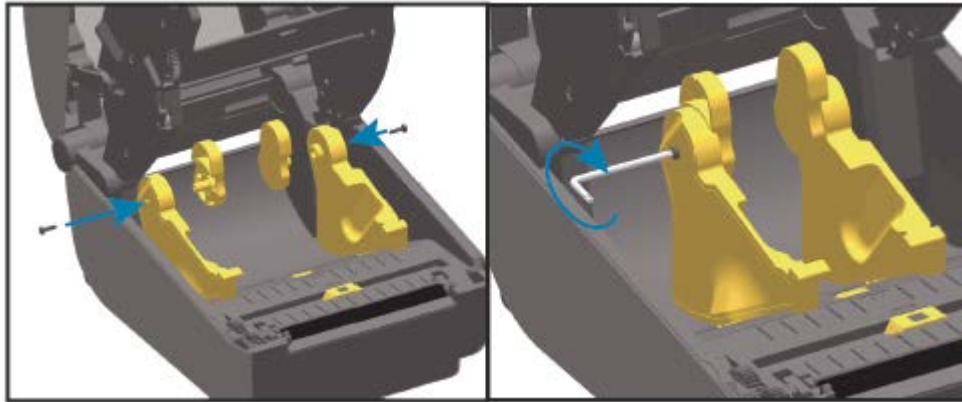
NOTE: When you remove the media adapters to print on standard roll cores, plastic pieces on the sides of the media roll holders may rub against the roll. If so, push the attached pieces back into the side of the media roll holder.

Installing Media Roll Adapters

1. Place one screw in the top adapter mounting hole of both of the roll holders. Turn the screws clockwise using the Torx wrench until the tip of the screw barely protrudes through the inside of the roll holder.



NOTE: The screws are self-tapping.



2. Place the adapter on the inside of the roll holder, making sure the large side is on top and the smooth side (no ribs) face the middle of the printer.
3. Align the adapter's top screw hole to the protruding screw tip and pinch it tightly to the roll holder body. Tighten the screw until there is no gap between the adapter and roll holder. Do not tighten beyond this point.



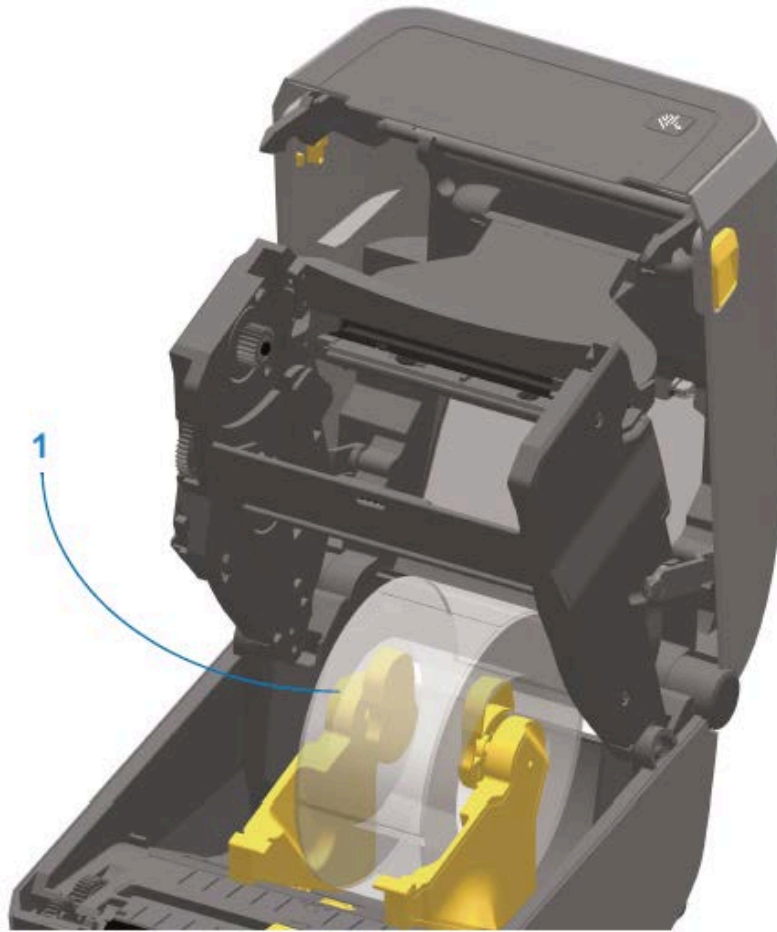
IMPORTANT: Over-tightening will strip the thread.

4. Insert a screw in the bottom adapter mounting hole. Pinch the adapter tightly to the roll holder while tightening the screw. Tighten the screw until there is no gap between the adapter and roll holder. Do not tighten beyond this point.



IMPORTANT: Over-tightening will strip the thread.

5. Repeat the above steps to install the other adapter and roll holder.



1	Label roll with 76.2 mm (3.0 in.) inner core mounted on media core adapters (shown as an example)
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Print Resolution Upgrade Kits

Zebra offers four print resolution upgrade kits. The upgrade procedure is the same for all four kits and they require changing both the printhead and platen / drive rollers (because they are print-resolution dependent). The printer automatically detects changes in the printheads. Platen roller materials are identifiable by color.

For standard printing, or for linerless printing (available only on ZD620 Direct Thermal printers), you can change the print resolution from:

- 203 dpi to 300 dpi
- 300 dpi to 203 dpi

Printheads provided with the upgrade kits include a 203 or 300 marking to help you keep the upgrade printhead separate from the original printhead. The original printhead contains no marking identifying its print resolution.

The platen (drive) rollers are colored differently to help you keep from accidentally using the old platen roller. See [Identifying Platen Drive Rollers Types](#) on page 32.

Installing the Printhead Resolution Upgrade Kits

1. Turn printer power OFF and disconnect the power source.
2. Replace the platen roller using the instructions in [Cleaning and Replacing the Platen](#) on page 213.
3. Replace the printhead using instructions in [Replacing the Printhead](#) on page 216.
4. Connect power to the printer and turn printer power ON.

The printer automatically detects the change in printhead (but not the platen) during power-up self-check.



NOTE: For optimal results and the latest printer features and operation, download and install the latest printer firmware. See [Updating Printer Firmware](#) on page 230.

Power Base Options

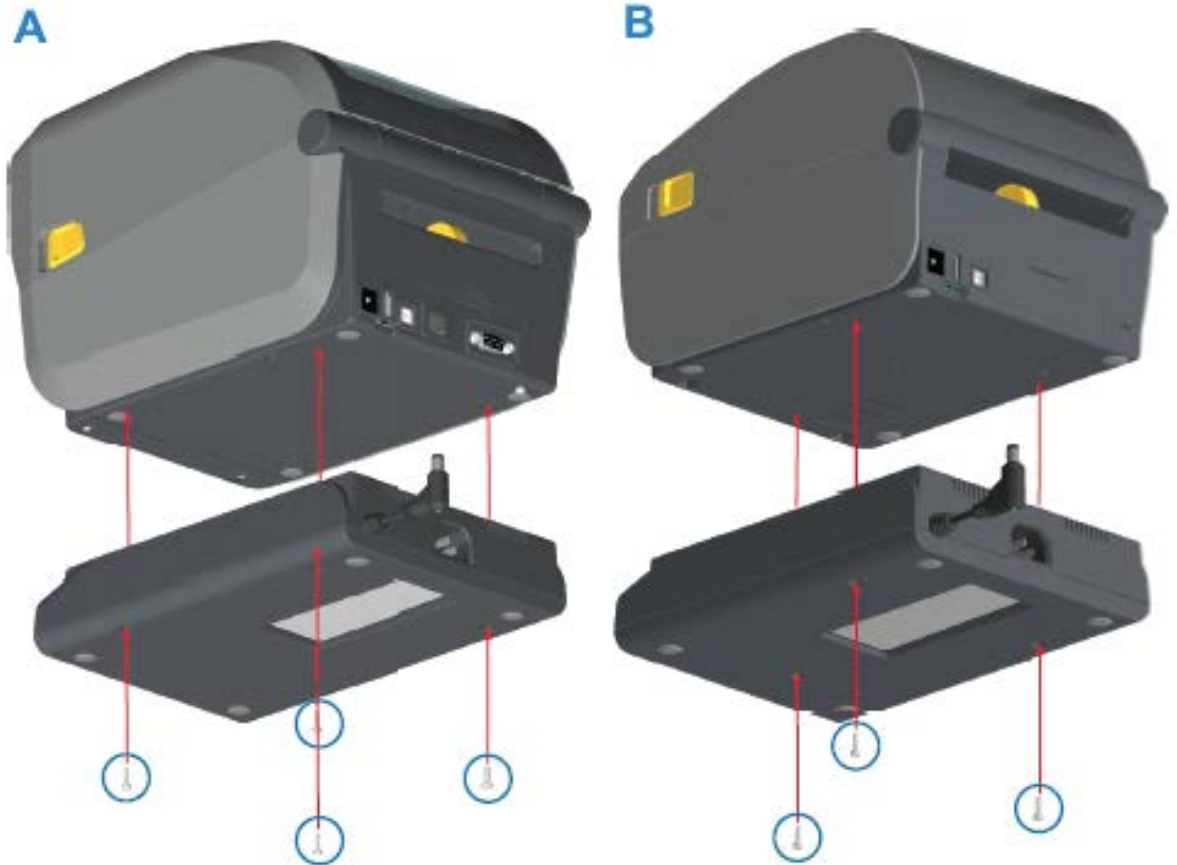
This section describes power base options and how to install them.

Installing the Attached Power Supply Base Options

The power base is designed for quick installation using a Torx T10 wrench (that you supply) and mounting screws provided with the upgrade kit. Direct

1. Remove media rolls (if any) from the printer.
2. Unplug the power supply cable from the back of the printer.
3. Turn the printer over, then align the power base to the bottom of the printer with the printer power plug oriented toward the rear side of the printer. The printer's rubber feet should align with recesses on the top of the power base.

4. Use the screws provided to attach the power base to the printer. Thermal Transfer printer models use four screws (A), and Direct Thermal printer models attach to the printer with three screws (B). Tighten the screws using the Torx wrench.



5. Insert the DC input power plug into the printer.



1	DC input power plug
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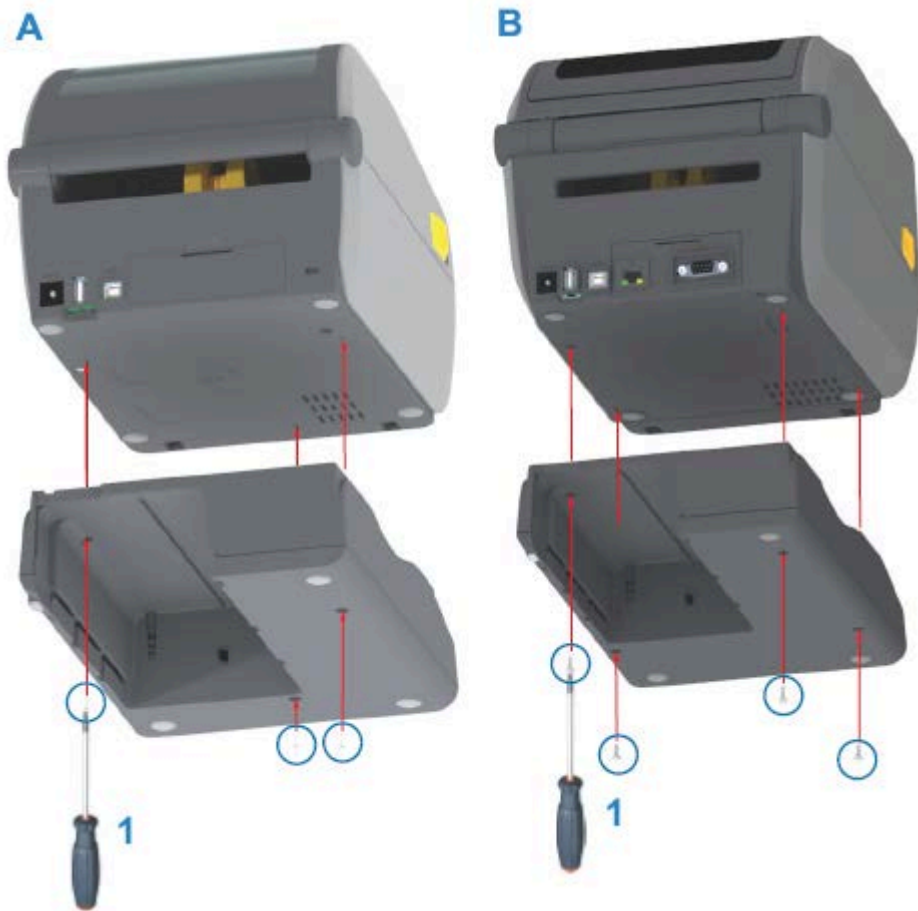
6. Re-connect the AC power cord to the printer power base.

Installing the Attached Battery Base Options

The battery base is ready to attach to the printer. The base is installed using a Torx T10 wrench and the mounting screws provided with the upgrade kit.

1. Remove any media rolls from the printer. Remove the original power supply cable from the back of the printer.
2. Turn the printer over and align the power base to the bottom of the printer with the printer power plug oriented toward the rear of the printer. The printer's rubber feet should align with the recesses in the top of the power base.

3. Use the screws provided to attach the power base to the printer. Thermal Transfer printer models use four screws (A) and Direct Thermal printer models use three screws (B). Tighten the screws using the Torx wrench supplied in the kit.



Installing the Battery into the Attached Power Base

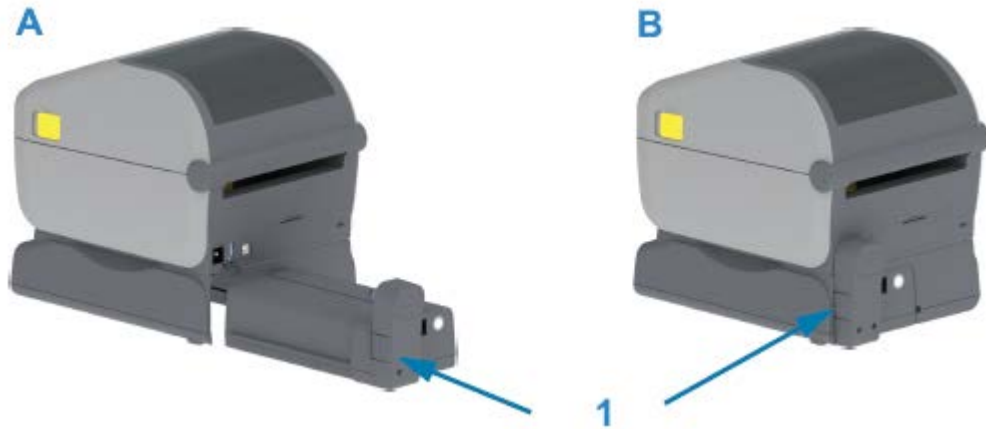


IMPORTANT: The attached battery base must be properly installed and securely connected your printer to keep from damaging the printer or the battery.

1. Disconnect the printer's external power supply from the DC power input connector located on the rear of the printer.

2. Slide the battery into the battery slot on the battery base. Push the battery into the base until battery pack is flush to the rear of the battery base, and the connectors on the battery pack are engaged with the ports on the back of the printer.

This image shows the position of the battery when it is ready to install (A) and the battery installed in the base (B).



1	Battery latch
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NOTE: Batteries are shipped in shutdown mode for safety and to keep the battery from discharging during storage and shipping. The battery requires charging prior to initial use with the printer.

3. Attach the printer's power supply to the battery to wake up the battery from shutdown mode and begin its initial charge.



4. The printer must be fully charged before first use. See [Battery Indicators and Controls](#) on page 68 to learn how to:
 - Turn the battery on.
 - Discover battery-charge-saving features and behaviors.
 - Check the battery's charge level and health.

The printer will take approximately two hours to reach full charge. The battery status / health indicator (lighting bolt) turns from Amber (charging) to Green (charged).

Controls and Indicators

This section discusses the two user control panel variations and their functionality.

User Interface

The printer's primary user interface controls are on the front of the device. Two user interface options are available on these printers.

- **Standard User Interface** — This interface serves basic printer control and status functions. Operating status is provided by five icon indicator lights. These lights, together and in combination, provide a wide range of printer status notifications. They are visible from a farther distance than the proximity needed to read a printer display screen. See the [Meaning of the Indicator Light Patterns](#) on page 60.
 - The printer user interface supports various routine tasks such as replacing printing supplies (labels, receipt paper, transfer ribbon, etc.). A media out condition, for example, is indicated by two indicators.
 - Each status indicator icon represent a functional area of printer operation such as SUPPLIES or NETWORK.
 - Status indicator lights light up in color to show the functional status of the printer.
 - Depending on the state of the printer, the printer indicators may be off (not lit) or light up red, green, or amber (orange yellow) —blinking / flashing, fading (bright to off), or lighting up steady in a variety of patterns—to convey the printer's status and activities (data downloading, over-temperature cooling cycle, etc.). A status indicator that is off (un-lit) does not require user attention.
 - Control buttons are used in various combinations to access internal utilities that calibrate the printer to your media and to make a limited set of changes to the printer settings.
- **LCD User Interface** — This color LCD interface provides easy printer setup, configuration, and is customizable for all user types. The interface includes all standard user interface controls and indicators to provide status information for these Link-OS printers.
 - The display option on the printer provides printer status and messages. It supports 19 languages, selectable by the operator or with programming.
 - The menu system allows you to change print settings (darkness, speed, etc.), run utilities, and set wired and wireless communication interfaces (serial, Ethernet, Wi-Fi, etc.) installed on your printer.

Standard Interface Controls

This table describes the printers standard interface controls.

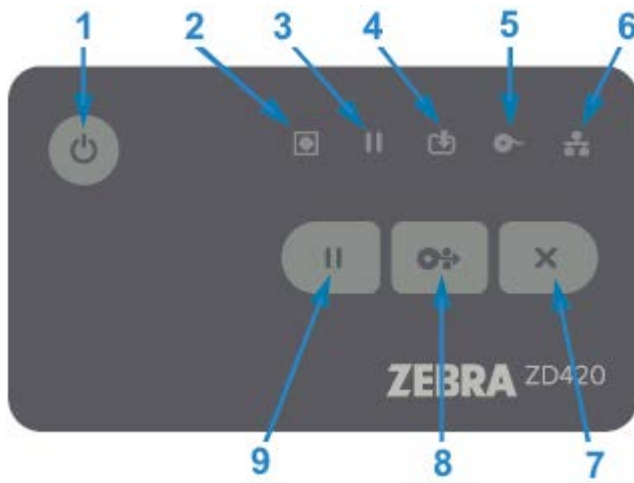


Table 5 Standard Interface Controls

Icon	Button	Descriptions
	1. POWER button — Turns power to the printer ON and OFF. Also used to initiate low-power sleep and wake states.	- Initial Power ON — Press the Power button until the printer's indicator lights flash on. The indicator lights flash on and off in various combinations while the printer does self diagnostics, configuration checks, and integrates optional components. This will take several seconds to complete. The Status indicator will turn solid green, indicating the printer is ready for normal print operations. - Sleep Mode — Pressing and releasing the button once will cause the printer to enter Sleep Mode. The printer will turn off after storing various configuration and status information in memory. All the indicators will be off except the Status Indicator will slowly change between On and Off to indicate Sleep Mode. - Power OFF with Sleep Mode Delayed — Press and hold the button for 4-9 seconds. You can start a batch print job and put the printer into the low power consumption state of Sleep mode — after the job has finished. - Power OFF / Shutdown — Press and hold the button for 4-9 seconds. The printer will turn OFF. - Power Failure Recovery Mode — This printer feature is activated by a hardware jumper setting on one of the optional Printer Connectivity Modules installed in the printer. See Setting the Power Failure Recovery Mode Jumper on page 187. - The printer will automatically Power ON when plugged into an active (ON) AC power source. - Supports Sleep Mode and Power OFF with Sleep mode Delayed. - A Power OFF / Shutdown will reset the printer and then runs the Initial Power ON sequence.  NOTE: Power Failure Recovery Mode is available ONLY on printers with a printer connectivity module installed.

Table 5 Standard Interface Controls (Continued)

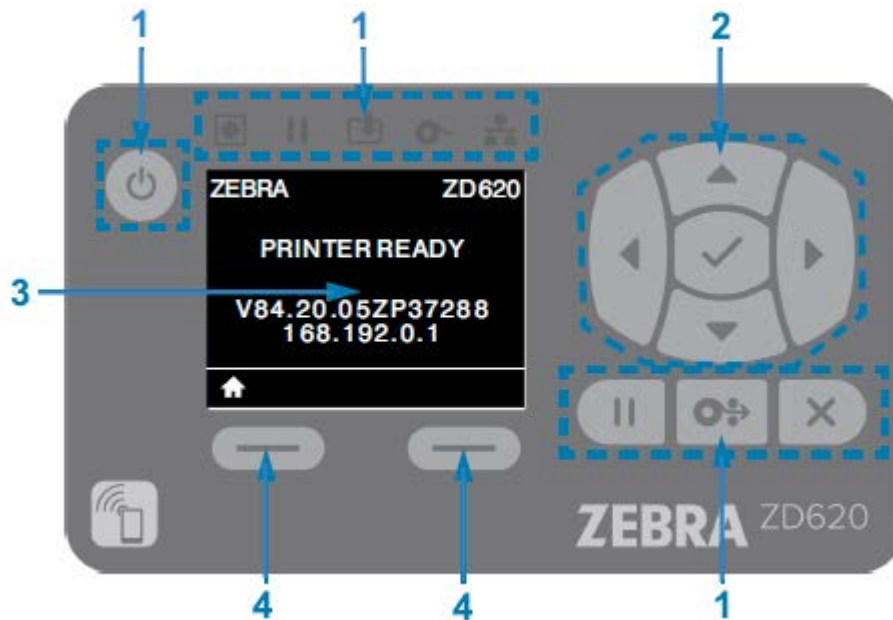
Icon	Button	Descriptions
	2. Status Indicator — Primary status indicator for overall printer health and operational status. Also known as the Power indicator.	- Green — Ready for print and data activity. - Green, Slowly Changing between ON and OFF — Printer is in Sleep Mode. - Red — Media out, media detection error, head (cover/printhead) open, cut error, printhead authentication failure. - Amber — Printhead Over Temp (temperature), printhead element failure, out of memory while storing content (formats, graphics, fonts, etc.), and interface power fault for USB Host or serial ports. - Blinking Amber — Printhead Under Temp (temperature) - Blinking Red — Printhead Over Temp (temperature) . This status is coupled with blinking red Pause indicator. Requires cooling and printer restart.
	3. Pause Indicator — The printer is in Pause mode when the Pause indicator light is on. A label (print form) or all labels (print forms) in the print buffer's queue can be canceled when the Pause indicator is on using the CANCEL button.	- Amber: The printer is paused. Print, label FEED (advance), and other label routines are suspended until the pause state is removed by pressing PAUSE. - Blinking Red: Printhead Over Temp (temperature) — this status is coupled with blinking red Status indicator. Requires cooling and printer restart.
	4. Data Indicator — Indicates the status of data transfer activity.	- Off — Data is not being transferred. - Green — A data communication operation has not finished, but is not actively being transferred. - Blinking Green — Data communications are in process. - Blinking Amber — Out of memory while storing content (formats, graphics, fonts, etc.).
	5. Supplies Indicator — Indicates media (label, receipt, tags, transfer ribbon, ribbon cartridge, etc.) status.	- Red: Media Out condition. - Blinking Red: Ribbon out. - Blinking Red and Amber: Ribbon Cartridge Low (ZD420 Cartridge printers only). - Blinking Amber: Ribbon In (ZD420 Cartridge printers only), detected while the printer is attempting to print in direct thermal mode.

Table 5 Standard Interface Controls (Continued)

Icon	Button	Descriptions
	6. Network Indicator — Indicates network activity and status.	• Amber — 10 base Ethernet (LAN) connection detected. • Green — 10/100 Ethernet (LAN) connection detected or when Wi-Fi (WLAN) has a strong signal and is connected. • Red — when an Ethernet (LAN) or Wi-Fi (WLAN) fault occurs. • Blinking Red — during Wi-Fi (WLAN) association. • Blinking Amber — during Wi-Fi (WLAN) authentication. • Blinking Green — when Wi-Fi (WLAN) has completed, but has a weak signal.
	7. CANCEL Button — Cancels print jobs.	• Functional only when the printer is in Pause state. • Pressing CANCEL once causes the printer to cancel printing the next format in the print buffer. • Pressing and holding CANCEL for two seconds cancels printing of ALL pending formats.
	8. FEED (Advance) Button — Advance a label (print form/format).	• Feed One Label — Pressing and releasing FEED when the printer is not printing causes the printer to advance media one blank form/format length (label, receipt, tag, ticket, etc.). • Advance Multiple Labels — Pressing and holding FEED when the printer is not printing causes the printer to advance labels until released. It finishes advancing to the beginning position of the next label. • Reprint Last Label (activated via a SGD command: <code>ezpl.reprint_mode</code>) - This feature allows reprinting a failed media print. If the printer runs out of media (paper, labels, transfer ribbon, etc.), it can re-print the last label (print form/format). The print buffer that stores the print image available for reprint is cleared when the printer gets turned off or is reset.
	9. PAUSE Button — Pauses print and media movement actions.	• Pressing PAUSE stops print activities and places the printer into a Pause state. The printer completes printing a label that is printing before it pauses. • The Pause indicator displays Amber (orange/yellow) to indicate the Pause state. • Pressing PAUSE while in Pause state returns the printer to normal operation. If printing a multi-label (form/format) job or another print job is waiting to print in the print queue, the printer will resume printing.

LCD User Interface

Printers with the display provide the operator and integrator with readable printer status and a menu system.



1	Standard Interface Controls — Provides visual and operational continuity for users that use both styles of Zebra Link-OS printers.
2	LCD Navigation Controller and Selector — Navigate through printer menus and parameter settings on the LCD using the direction ARROW buttons to choose printer settings and utility actions. Use the SELECT (check mark) button to items that are highlighted (icons) or displayed as named menu items.
3	Display — Displays printer status information and the printer configuration menu system. The printer's default screen information is shown. The top line has printer model information and can be customized. The center area is for printer status information and pop-up messages.
4	Action Selectors — The action selector buttons, LEFT SELECT and RIGHT SELECT , activates item highlighted white, like the Home icon (used to activate the menu system). Pressing the LEFT SELECT immediately below the HOME icon returns you to the menu's Home screen.

Meaning of the Indicator Light Patterns

All Link-OS 4 inch printers include status indicators on their user interfaces.

The indicators may be off or on in a variety of lighting patterns of red, green, or amber (orange/yellow). They may flash (blink), fade (bright to off), alternate between colors, or simply remain lit. as indicated in the table below.

	Steady on
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	Flashing
	Fade
	Off

Status – Typical Operating Conditions

This table describes the printers' status under typical operating conditions.

Table 6 Typical Operating Conditions Status Indications

Status	Description
Printer Ready STATUS PAUSE DATA SUPPLIES NETWORK 	The printer is powered on and ready to print.
Pause STATUS PAUSE DATA SUPPLIES NETWORK 	The printer is paused. The operator must press the Pause button to resume print operations.
Media Out STATUS PAUSE DATA SUPPLIES NETWORK 	The media (labels, receipts, tags, tickets, etc.) supply is out. The printer needs attention and cannot continue without user intervention.
Ribbon Out STATUS PAUSE DATA SUPPLIES NETWORK 	Detected end of ribbon roll (reflective end on ribbon rolls), a missing ribbon cartridge, or the ribbon cartridge needs replaced to continue printing when the printer is in thermal transfer mode.
Ribbon Low (Ribbon Cartridge Printers only) STATUS PAUSE DATA SUPPLIES NETWORK 	Default value is 10% of ribbon remaining. The Media indicator flashes red and yellow while the Status indicator is solid yellow.
Ribbon In (Ribbon Cartridge Printers Only) STATUS PAUSE DATA SUPPLIES NETWORK 	Thermal transfer printer is in Direct Thermal Mode and has a ribbon cartridge installed. Remove the ribbon cartridge to continue printing in direct thermal mode.

Table 6 Typical Operating Conditions Status Indications (Continued)

Status	Description
Transferring Data STATUS PAUSE DATA SUPPLIES NETWORK 	Data communications are in process.
Data Transfers Paused STATUS PAUSE DATA SUPPLIES NETWORK 	A data communication operation has not finished, but is not actively being transferred.
Out of Memory 	Out of memory while storing content (formats, graphics, fonts, etc.).
Cover Open/Printhead (PH) Open STATUS PAUSE DATA SUPPLIES NETWORK 	The cover (printhead) is open. The printer needs attention and cannot continue without user intervention.
Cut Error (Binding) STATUS PAUSE DATA SUPPLIES NETWORK 	The cutter blade is bound and is not moving properly.
Cartridge Authentication Failed STATUS PAUSE DATA SUPPLIES NETWORK 	The ribbon cartridge can not be authenticated or has been altered. The printer only supports Genuine Zebra Ribbon Cartridges and does not support refurbished or non-Zebra cartridges.

Status – Printhead Operation

This table describes status indicator conditions you may see during printhead operations and what those conditions mean.



CAUTION: The printhead may be hot and could cause severe burns. Allow the printhead to cool.

Table 7 Printhead Operation Status Indications

Status	Description
Printhead Over Temp STATUS PAUSE DATA SUPPLIES NETWORK 	The printhead is over temperature and paused to allow the printhead to cool. The print operation will resume after the printhead has cooled.

Table 7 Printhead Operation Status Indications (Continued)

Status	Description
Printhead Under Temp STATUS PAUSE DATA SUPPLIES NETWORK 	The printhead is under temperature. Typically, the operating environment is below the printer's minimum operational temperature.
Printhead Shutdown STATUS PAUSE DATA SUPPLIES NETWORK 	The printhead is over temperature. Turn the printer OFF. After several minutes to allow the printer to completely cool, turn the printer ON.
Printhead Resolution Error STATUS PAUSE DATA SUPPLIES NETWORK 	The printer is unable to read the printhead resolution type (dpi). The printhead has been replaced incorrectly or with non-Zebra printhead.
Unauthorized Printhead Error STATUS PAUSE DATA SUPPLIES NETWORK 	The printhead was replaced with one that is not a genuine Zebra printhead. Install a genuine Zebra printhead to continue.

Status – Bluetooth Low Energy Option

This table describes Bluetooth status indications and what they mean.

Table 8 Bluetooth Low Energy Status Indicators

Status	Description
Bluetooth LE Paired STATUS PAUSE DATA SUPPLIES NETWORK 	Bluetooth Low Energy has paired.
Bluetooth LE Failed to Pair STATUS PAUSE DATA SUPPLIES NETWORK 	Bluetooth Low Energy has failed to pair.

Status – Ethernet (LAN) Option

This table describes Ethernet (LAN) statuses.

Table 9 Ethernet (LAN) Status Indications

Status	Description
Ethernet (LAN) No Link 	No Ethernet link is available. NETWORK status is light off.
Ethernet (LAN) 100base Link 	A 100 Base link was found.
Ethernet (LAN) 10base Link 	A 10 Base link was found.
Ethernet (LAN) Link Error 	An error condition exists. The printer is not connected to your network.

Status – Wi-Fi (WLAN) Option

This table describes Wi-Fi (WLAN) statuses.

Table 10 Wi-Fi (WLAN) Status Indications

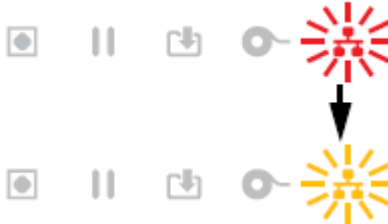
Status	Description
Wi-Fi Connecting to WLAN 	The light flashes red while the printer associates with the network. The light then flashes yellow while the printer is authenticating with the network.
Wi-Fi (WLAN) 100base Link 	The printer is connected to your network and the Wi-Fi signal is strong.

Table 10 Wi-Fi (WLAN) Status Indications (Continued)

Status	Description
Wi-Fi (WLAN) 10base Link STATUS PAUSE DATA SUPPLIES NETWORK 	The printer is connected to your network and the Wi-Fi signal is weak.
Wi-Fi (WLAN) Link Error STATUS PAUSE DATA SUPPLIES NETWORK 	An error condition exists. The printer is not connected to your network.

Display Controls and Menus

ZD620 printers are equipped with an LCD user interface. The interface displays status and includes menus which you can use to configure your printer and run internal printer utilities. The printer can display messages in multiple languages based on the language setting you specify.

The printer's default screen information is shown here.



- The top line of the display shows printer model information.
- The center area of the display shows printer status information (customizable) and pop-up messages.
- The two bottom lines on the display, by default, show the printer's firmware version and the printer's IP address. This area can be customized to show different, user-selectable information. See [Idle Display \(Default Start-up Screen\)](#) on page 66 for details.
- The lower area of the display below the white line are for action items.

Navigating the Menu Display Screens

This section displays options available for navigating through the screens of the LCD user interface, and how to select or modify items shown on the printer display.

Idle Display (Default Start-up Screen)



At the Idle Display, press **LEFT SELECT** or **CENTER SELECT** (check mark) to go to the printer's HOME menu.

Home Menu



- To move from icon to icon in the Home menu, press any of the **ARROW** buttons.
- When an icon is selected, its colors are reversed to highlight it. For example, when the Settings menu is selected, it looks like this: . When the Settings menu icon is not selected, it appears like this: .
- To select the highlighted menu icon and enter the menu, press center **SELECT** (the check mark).



Controls and Indicators

- Press **LEFT SELECT** to exit the Home menu and return to the Idle Display. The printer automatically returns to the Idle Display after 15 seconds of inactivity in the Home menu.



- To scroll through the items in a user menu, press the **LEFT ARROW** or **RIGHT ARROW**.
- Menu items with ▲ and ▼ on the far left and right sides of the display indicate that a value can be changed. The value displayed is the setting.
- Press the **UP ARROW** or **DOWN ARROW** to scroll through accepted values. Any changes you make are saved immediately when you exit the menu item.



- Menu shortcuts make it easy to navigate the menus shown in the display. When you reach the end of one menu, the next menu will be displayed (an adjacent menu). To go to the next user menu from a menu shortcut, press **SELECT** (the check mark) or **RIGHT SELECT** to select the **GO** (go to menu) action. The display shows the first menu item of the newly-selected menu.



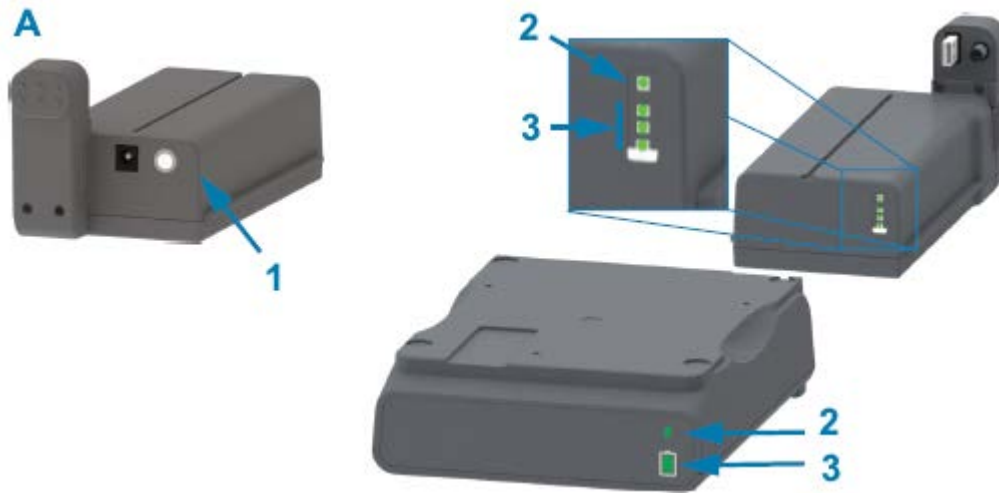
- A word in the lower-right corner of the display indicates an available action.
- Press **SELECT** (check mark) or press **RIGHT SELECT** to perform the action shown.

Battery Indicators and Controls

The optional printer battery accessory has a simple, one button, four-LED indicator user interface to control and display battery status and health. The battery acts as an uninterruptible power supply (UPS) for the printer.

For more information on using the battery with your printer and power saving modes (Sleep, Shutdown, etc.), see [Printing with the Attached Battery Base and Battery Option](#) on page 182.

The battery indicators are located on the rear of the battery (A).



1	Battery Control button
2	Battery health indicator

3	Battery charge level indicator
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Table 11 Battery Indicators and Controls

Icon	Button/Indicator	Descriptions
	Battery Control button—The button helps you control the battery, both inside and outside of the printer.	- Pressing and releasing this button when the battery is on does the following: - Wakes up (activates power) the battery from Sleep mode or Shutdown mode. The battery health and charge status are checked. The battery indicators all flash on and off together three times. You have one minute to turn printer power on before the battery reverts to a prior Sleep mode or Shutdown mode. - The battery displays the battery level charge in the first 10 seconds after internal battery health checks are complete To make the printer enter shutdown mode, press and hold Battery Control for 10–11 seconds and release. The battery starts shutting down. Approximately three seconds later, all battery LEDs flash three times to let you know the battery has shut down.
	Battery Health indicator—Displays the battery's charging status and health of the battery.	- Green—Good health, charge complete and ready to operate. - Amber—Charging (printer is OFF). - Red—Battery has an internal error. Remove the battery and see Troubleshooting on page 232. - Flashing red—Charging error - over or under temperature, internal monitoring error, etc.
	Battery Charge Level indicator—Displays the battery's charging status and health of the battery	- Three green bars on, no flashes—The battery is fully charged. (The battery will not start charging.) - Two green bars on with the top bar flashing—The battery is at less than full charge. - One green bar flash—It is time to charge your battery! - No bars on—The battery needs charging, but the Battery Health indicator flashes when the Battery Control button is pressed. The printer cannot be turned on. - Amber—The battery is charging.

Printer Configuration Menus

This section lists modifiable printer settings and ways of changing them.

Adjust Printer Settings

You can modify printer settings in one or more of the three ways described here. Some settings are modifiable only through a subset of these methods. The appropriate methods available to modify each setting are listed under the various menu tables in this guide.

- Using the printer's user menus — Settings, Tools, Network, Battery, Language, Sensors, Ports, and Bluetooth)
- Issuing ZPL and Set/Get/Do (SGD) commands — which are described in the Zebra ZPL Programming Guide, or
- Through the printer's web pages — if the printer is active on your network through a wired or wireless connection.

To download the Zebra ZPL Programming Guide, go to the appropriate product support page for your printer listed in [About this Guide](#) on page 11.

The above-mentioned support pages also include the link to the Zebra Wired and Wireless Print Servers User Guide which explains how to set up your printer on a network.

User Menus

The menu design on your printer is task-based, to make it easy to change printer settings as needed. Click any menu item to go to its description in the table.

For information on navigating these menus, see [Navigating the Menu Display Screens](#) on page 66.

Printer Configuration Menus

 SETTINGS	 TOOLS	 NETWORK	 BATTERY
• DARKNESS • PRINT SPEED • MEDIA TYPE • PRINT METHOD • TEAR OFF • PRINT WIDTH • PRINT MODE • LABEL TOP • LEFT POSITION • REPRINT MODE • LABEL LENGTH MAX • LANGUAGE** • TOOLS MENU*	• PRINT INFORMATION** • IDLE DISPLAY • POWER UP ACTION • HEAD CLOSE ACTION • LOAD DEFAULTS • MEDIA/RIBBON CAL** • DIAGNOSTIC MODE • CONFIG INFO TO USB • ZBI ENABLED? • RUN ZBI PROGRAM • STOP ZBI PROGRAM • PRINT USB FILE • COPY USB FILE TO E: • STORE E: FILE TO USB • PRINT STATION • PASSWORD PROTECT • PRINT TEST FORMAT • NETWORK MENU*	• ACTIVE PRINT SERVER • PRIMARY NETWORK • WIRED IP ADDRESS • WIRED SUBNET MASK • WIRED GATEWAY • WIRED IP PROTOCOL • WIRED MAC ADDRESS • WLAN IP ADDRESS • WLAN SUBNET MASK • WLAN GATEWAY • WLAN IP PROTOCOL • WLAN MAC ADDRESS • ESSID • CHANNEL • SIGNAL • IP PORT • IP ALTERNATE PORT • PRINT INFORMATION** • RESET NETWORK • VISIBILITY AGENT • BATTERY MENU	• BATTERY STATUS • LANGUAGE MENU*
 LANGUAGE	 SENSORS	 PORTS	 BLUETOOTH
• LANGUAGE** • COMMAND LANGUAGE • COMMAND CHAR • CONTROL CHAR • DELIMITER CHAR • ZPL MODE • VIRTUAL DEVICE • SENSORS MENU*	• SENSOR TYPE • MEDIA/RIBBON CAL** • PRINT INFORMATION** • LABEL SENSOR • TAKE LABEL • PORTS MENU*	• BAUD RATE • DATA BITS • PARITY • HOST HANDSHAKE • WML • BLUETOOTH MENU*	• BLUETOOTH ADDRESS • MODE • DISCOVERY • CONNECTED • BT SPEC VERSION • MIN SECURITY MODE • SETTINGS MENU*

* Denotes a shortcut to the next menu.

** Appears in multiple user menus for your convenience.

Settings Menu

This table describes the Setting menu items.

Table 12 Settings Menu Items

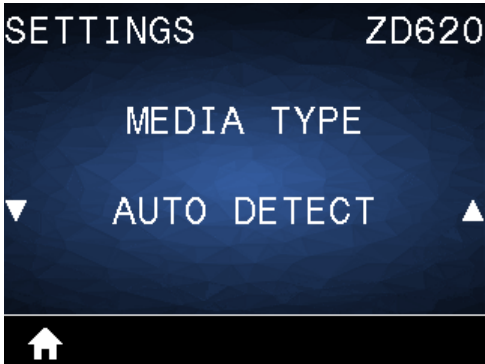
Setting	Description, Accepted Values, and Configuration Methods
DARKNESS 	Set the print darkness to the lowest setting that provides good print quality. If you set the darkness too high, the label image may not print clearly, barcodes may not scan correctly, the ribbon may burn through, or the printhead may wear prematurely. If desired, generate a print quality report to determine the best darkness setting. See Printing a Print Quality Report (FEED Self-Test) on page 246. Accepted values: 0.0 to 30.0 Related ZPL command(s): ^MD, ~SD SGD command used: print.tone Print Server web page: View and Modify Printer Settings > General Setup > Darkness
PRINT SPEED 	Select the speed in inches per second (ips) at which to print the label. Slower print speeds typically yield better print quality. Accepted values: • ZD620 203 dpi = 2 to 8 ips • ZD620 300 dpi = 2 to 6 ips • ZD420 203 dpi = 2 to 6 ips • ZD420 300 dpi = 2 to 4 ips Related ZPL command(s): ^PR SGD command used: ezpl.media_type Print Server web page: View and Modify Printer Settings > General Setup > Print Speed
MEDIA TYPE 	Select the type of media that you are using. Accepted values: CONTINUOUS, GAP/WEB, MARK/NOTCH If you select CONTINUOUS, you must include a label length in your label format (^LL if you are using ZPL). If you select GAP/WEB or MARK/NOTCH for various noncontinuous media, the printer feeds media to calculate the label length. Related ZPL command(s): ^MN SGD command used: ezpl.media_type Print Server web page: View and Modify Printer Settings > General Setup > Media Type

Table 12 Settings Menu Items (Continued)

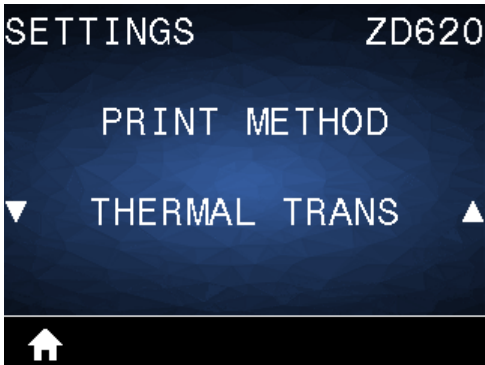
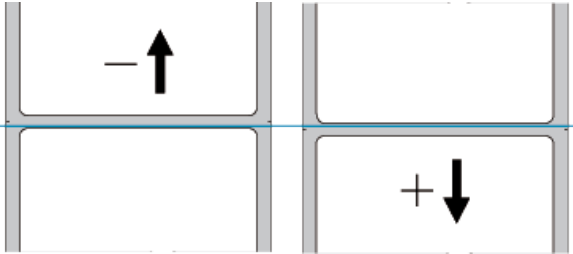
Setting	Description, Accepted Values, and Configuration Methods
PRINT METHOD 	Specify if the printer needs to use ribbon for printing. Accepted values: - THERMAL TRANS—Uses ribbon and thermal transfer media. - DIRECT THERMAL—Uses direct thermal media and no ribbon. Related ZPL command(s): ^MT SGD command used: <code>ezpl.print_method</code> Print Server web page: View and Modify Printer Settings > General Setup > Print Method
TEAR OFF 	Adjusts the rest position of the media after a label is printed. The rest or stop position sets where the tear-off point is on or between labels. If necessary, shift the position of the media over the tear-off bar after printing. - Lower numbers move the media into the printer by the specified number of dots (the tear line moves closer to the edge of the label just printed). - Higher numbers move the media out of the printer (the tear line moves closer to the leading edge of the next label).  Accepted values: –120 to 120 Related ZPL command(s): ~TA SGD comand used: <code>ezpl.tear_off</code> Print Server web page: View and Modify Printer Settings > General Setup > Tear Off

Table 12 Settings Menu Items (Continued)

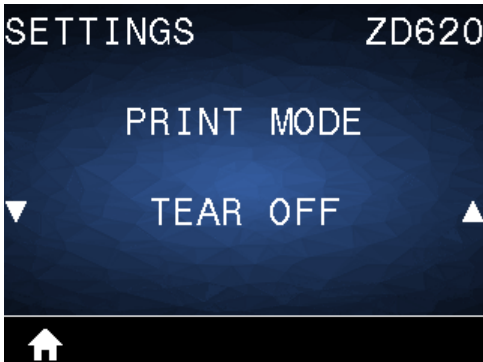
Setting	Description, Accepted Values, and Configuration Methods
PRINT WIDTH 	Accepted values: • ZD620 203 dpi = 0002 to 832 dots • • ZD620 300 dpi = 0002 to 1280* dots • ZD420 203 dpi = 0002 to 832 dots • ZD420 300 dpi = 0002 to 1280* dots (EPL mode has a maximum default width of 1248 dots.)  IMPORTANT: Setting the print width too wide wastes formatting memory.  CAUTION: Printing off the sides of the label and onto the platen roller may damage the platen. Related ZPL command(s): ^PW SGD command used: <code>ezpl.print_width</code> Print Server web page: View and Modify Printer Settings > General Setup > Print Width  NOTE: Setting the width too narrow can result in portions of a label format not being printed on the media. This setting can affect the horizontal position of the label format if the image was inverted using the ZPL II ^POI command.
PRINT MODE 	Select a print mode that is compatible with your printer options. For information about how the print mode selections work with different printer options, see Selecting a Print Mode on page 173. Accepted values: TEAR-OFF, PEEL-OFF, CUTTER Related ZPL command(s): ^MM SGD command used: <code>media.printmode</code> Print Server web page: View and Modify Printer Settings > General Setup > Print Mode

Table 12 Settings Menu Items (Continued)

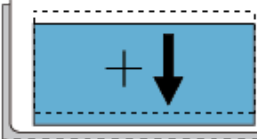
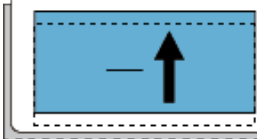
Setting	Description, Accepted Values, and Configuration Methods
LABEL TOP 	Shifts the position of the image vertically on the label if necessary.  • Negative numbers move the image higher on the label (toward the printhead). • Positive numbers move the image farther down on the label (away from the printhead) by the specified number of dots. Accepted values: -120 to 120 Related ZPL command(s): ^LT Print Server web page: View and Modify Printer Settings > General Setup > Label Top

Table 12 Settings Menu Items (Continued)

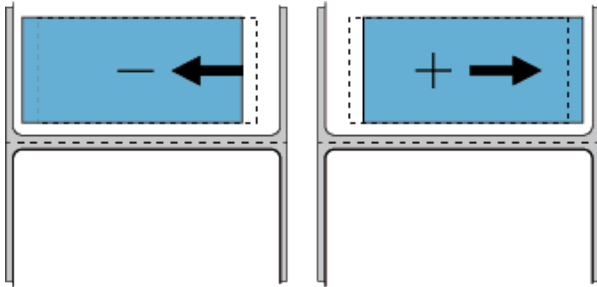
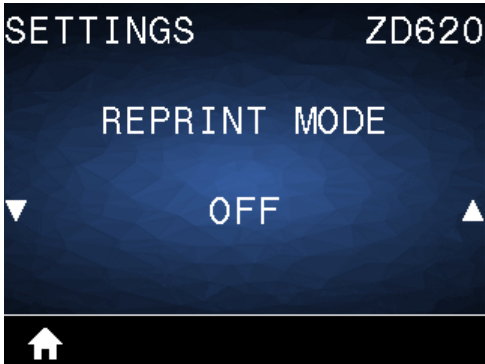
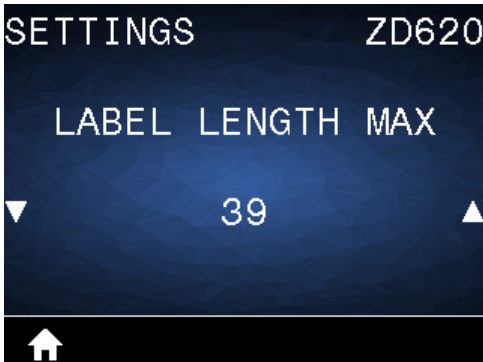
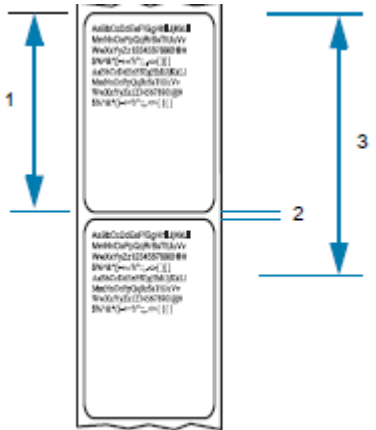
Setting	Description, Accepted Values, and Configuration Methods
LEFT POSITION 	Shifts the position of the image horizontally on the label, if necessary. - Negative numbers move the left edge of the image toward the left edge of the label by the number of dots selected. - Positive numbers move the edge of the image toward the right edge of the label.  Accepted values: -9999 to 9999 Related ZPL command(s): ^LS SGD command used: <code>zpl.left_position</code> Print Server web page: View and Modify Printer Settings > General Setup > Left Position
REPRINT MODE 	When reprint mode is enabled, you can reprint the last label printed by pressing FEED. Accepted values: ON or OFF (default) Related ZPL command(s): ^JZ SGD command used: <code>zpl.left_position</code> Print Server web page: Not supported at this time

Table 12 Settings Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
LABEL LENGTH MAX 	This setting controls the distance the printer utilities, like SmartCal, use to automatically detect labels (black mark, notch or gap/web). If the printer does not detect and calibrate the label, it assumes that continuous media is loaded. Set the value to the longest label used with the printer plus 25.4 mm (1.0 in.) greater than the maximum length label. Ideally, use a value that is two times the max. label length plus an inch.  In the image shown, 1 represents the label length, 2 the inter-label gap, and 3 a setting that accommodates one label length plus an inch. Accepted values: 1-39 (in.), 39 default Related ZPL command(s): ^ML (^LL, ^PW) SGD command used: <code>ezpl.label_length_max</code> Print Server web page: View and Modify Printer Settings > General Setup > Maximum Length

Tools Menu

This table describes the Tools menu items.

Table 13 Tools Menu Items

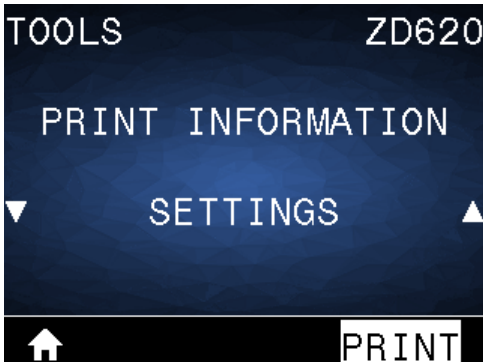
Setting	Description, Accepted Values, and Configuration Methods
PRINT INFORMATION  The screenshot shows a dark blue menu screen. At the top left is 'TOOLS' and at the top right is 'ZD620'. In the center, 'PRINT INFORMATION' is highlighted with a white border. Below it is 'SETTINGS'. At the bottom, there is a white home icon on the left and a 'PRINT' button on the right.	Print the selected information (one of seven choices) on one or more labels. This menu item is available through three user menus with different default values for each. Accepted values: • SETTINGS—Prints a printer configuration report. A sample label is shown in Test Printing with the Configuration Report on page 131. • NETWORK—Prints the settings for any print server or Bluetooth device that is installed. • FORMATS—Prints the available formats stored in the printer's RAM and Flash memory. • IMAGES—Prints the available images stored in the printer's RAM and Flash memory. • FONTS—Prints the available fonts in the printer, including standard printer fonts plus any optional fonts. Fonts may be stored in RAM and Flash memory. • BARCODES—Prints the available barcodes in the printer. Barcodes may be stored in RAM or Flash memory. • ALL—Prints the previous six labels. • SENSOR PROFILE—Shows the sensor settings compared to actual sensor readings. To interpret the results, see Manually Calibrating Media on page 255. Related ZPL command(s): • SETTINGS: ~WC • NETWORK: ~WL • SENSOR PROFILE: ~JG • Others: ^WD Print Server web page: View and Modify Printer Settings > Printer Settings > Print Listings on Label For examples of the Print Configuration and Network Configuration Reports, see Printing the Printer and Network Configuration Reports (CANCEL Self Test) on page 244.

Table 13 Tools Menu Items (Continued)

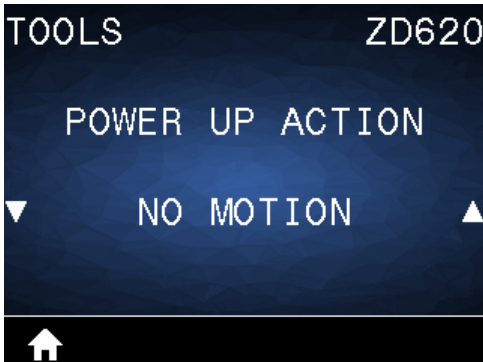
Setting	Description, Accepted Values, and Configuration Methods
IDLE DISPLAY 	Select one of six information formats to display when the printer is idle. Not shown with all configurations. Accepted values: - FW VERSION - IP ADDRESS - MM/DD/YY 24 HR - MM/DD/YY 12 HR - DD/MM/YY 24 HR - DD/MM/YY 12 HR Related ZPL command(s): None SGD commands used: <code>device.idle_display_format</code>, <code>device.idle_display_value</code> Print Server web page: None
POWER UP ACTION 	Set the action for the printer to take during the power-up sequence. Accepted values: - CALIBRATE—Adjusts sensor levels and thresholds, determines the label length, and feeds the media to the next web/gap. - FEED—Feeds the labels to the first registration point. - LENGTH—Determines the label length using current sensor values, and feeds the media to the next web/gap. - NO MOTION—Tells the printer not to move the media. You must manually ensure that the web is positioned correctly, or press feed to position the next web/gap. - SHORT CAL—Sets the media and web thresholds without adjusting sensor gain, determines the label length, and feeds the media to the next web/gap. Related ZPL command(s): <code>^MF</code> SGD command used: <code>ezpl.power_up_action</code> Print Server web page: View and Modify Printer Settings > Printer Settings >

Table 13 Tools Menu Items (Continued)

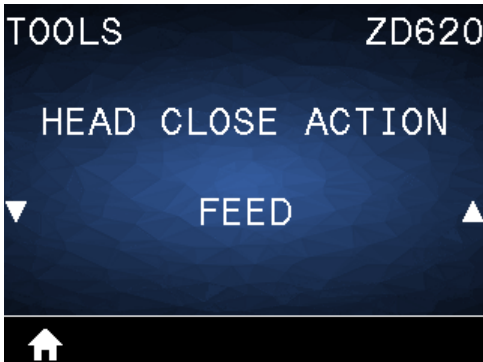
Setting	Description, Accepted Values, and Configuration Methods
HEAD CLOSE ACTION  The screenshot shows a dark blue menu screen. At the top left is 'TOOLS' and at the top right is 'ZD620'. The main title is 'HEAD CLOSE ACTION'. Below it is the option 'FEED'. There are left and right arrow icons on either side of 'FEED'. At the bottom left is a home icon.	Set the action for the printer to take when you close the printhead. Accepted values: • CALIBRATE—Adjusts sensor levels and thresholds, determines the label length, and feeds the media to the next web. • FEED—Feeds the labels to the first registration point. • LENGTH—Determines the label length using current sensor values, and feeds the media to the next web. • NO MOTION—Tells the printer not to move the media. You must manually ensure that the web is positioned correctly, or press feed to position the next web. • SHORT CAL—Sets the media and web thresholds without adjusting sensor gain, determines the label length, and feeds the media to the next web/gap. Related ZPL command(s): ^MF SGD command used: ezpl.head_close_action Print Server web page: View and Modify Printer Settings > Printer Settings > Calibration

Table 13 Tools Menu Items (Continued)

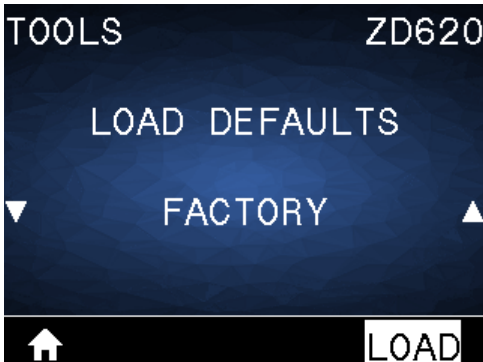
Setting	Description, Accepted Values, and Configuration Methods
LOAD DEFAULTS 	Restore specific printer, print server, and network settings back to the factory defaults. Use care when loading defaults because you will need to reload all settings that you changed manually. This menu item is available through two user menus with different default values for each. Accepted values: • FACTORY—Restores all printer settings other than the network settings back to the factory defaults. Use care when loading defaults because you will need to reload all settings that you changed manually. • NETWORK—Reinitializes the printer's wired or wireless print server. With a wireless print server, the printer also re-associates with your wireless network. • LAST SAVED—Loads settings from the last permanent save. Related ZPL command(s): SGD command used: • FACTORY: ^JUF • NETWORK: ^JUN • LAST SAVED: ^JUR SGD command used: None Print Server web page: View and Modify Printer Settings > Printer Settings > Calibration • FACTORY: View and Modify Printer Settings > Restore Default Configuration • NETWORK: Print Server Settings > Reset Print Server • LAST SAVED: View and Modify Printer Settings > Restore Saved Configuration

Table 13 Tools Menu Items (Continued)

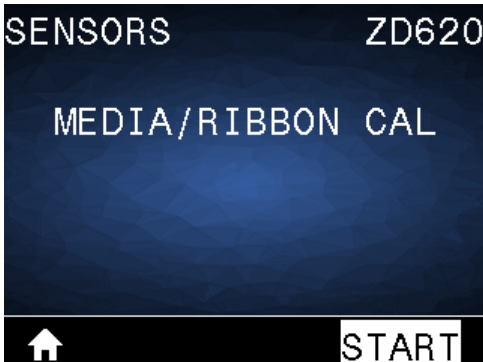
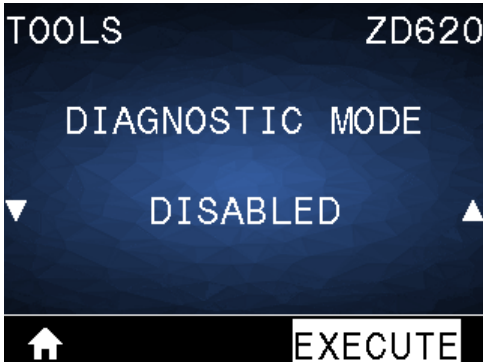
Setting	Description, Accepted Values, and Configuration Methods
MEDIA/RIBBON CAL 	Calibrate the printer to adjust the sensitivity of the media sensors. Related ZPL command(s): ~JC SGD command used: ezpl.manual_calibration Print Server web page: The calibration procedure cannot be initiated through the web pages.
DIAGNOSTIC MODE 	Use this diagnostics tool to cause the printer to output the hexadecimal values for all data received by the printer. For more information, see Performing a Communication Diagnostics Test on page 252. Accepted values: • PRINT • E: DRIVE • USB • MEMORY • DISABLED Related ZPL command(s): • ~JD to enable • ~JE to disable to enable SGD command used: device.diagnostic_print Print Server web page: The calibration procedure cannot be initiated through the web pages.

Table 13 Tools Menu Items (Continued)

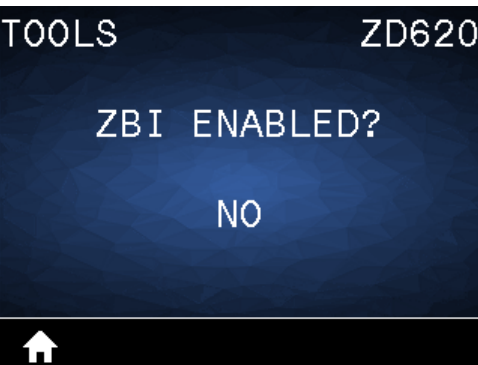
Setting	Description, Accepted Values, and Configuration Methods
CONFIG INFO TO USB  The screenshot shows a dark screen with white text. At the top left is 'TOOLS' and at the top right is 'ZD620'. In the center, it says 'CONFIG INFO TO USB' followed by 'NO USB DRIVE FOUND' on the next line. At the bottom left is a white house icon, and at the bottom right is a white box containing the word 'SEARCH'.	Allows you to send printer configuration report (equivalent to data returned by the printer to the host system when a ZPL ^HH command is issued). The printer sends a file (OUTxxx.txt where xxx = 000 to 999) to the USB drive in the printer USB Host port and formatted with the information supplied in USB Host Port and Link-OS Usage Examples on page 189. The printer configuration report filenames will increment with each report written to the USB drive (OUT001.txt increments to OUT002.txt the next time the file is written). Accepted values: • SEARCH (NO USB DRIVE FOUND) • WRITE (if USB drive is installed) Related ZPL command(s): ^HH (equivalent information reported) SGD commands used: • file.capture_response.begin • file.capture_response.end • file.capture_response.destination Print Server web page: None
ZBI ENABLED?  The screenshot shows a dark screen with white text. At the top left is 'TOOLS' and at the top right is 'ZD620'. In the center, it says 'ZBI ENABLED?' followed by 'NO' on the next line. At the bottom left is a white house icon.	Zebra Basic Interpreter (ZBI 2.0™) is a programming option that may be purchased for your printer. If you would like to purchase this option, contact your Zebra reseller for more information. Accepted values: • NO • YES Related ZPL command(s): None SGD command used: zbi.key (identifies if the ZBI 2.0 option is enabled or disabled on the printer) Print Server web page: None

Table 13 Tools Menu Items (Continued)

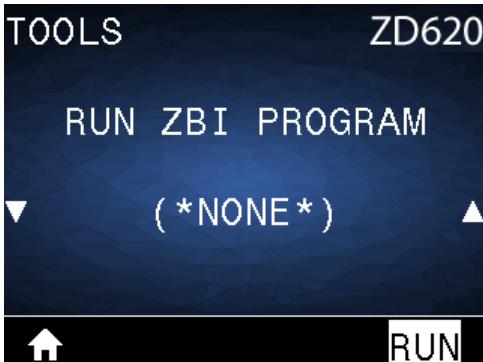
Setting	Description, Accepted Values, and Configuration Methods
RUN ZBI PROGRAM 	This menu item appears only if ZBI is enabled on your printer. If ZBI programs have been downloaded to your printer, you may select one to run using this menu item. If no program exists on your printer, NONE is listed. To run a ZBI program that you have downloaded to your printer: 1. Use the UP ARROW or DOWN ARROW to select a file from this menu. 2. Press RIGHT SELECT to select RUN. If no program exists, the RUN option does not perform an action. Accepted values: • NONE • PROGRAM FILE NAMES Related ZPL command(s): • ^JI • ~JI SGD command used: <code>zbi.control.run</code> Print Server web page: Printer Home Page > Directory Listing
STOP ZBI PROGRAM 	This menu item appears only if ZBI is enabled on your printer. Use this menu item to stop a ZBI program. The printer lists only programs that are running. To stop a ZBI program: 1. If necessary, use the UP ARROW or DOWN ARROW to select the file from this menu. 2. Press RIGHT SELECT to select STOP. Accepted values: • NONE • PROGRAM FILE NAMES Related ZPL command(s): <code>~JQ</code> SGD command used: <code>zbi.control.terminate</code> Print Server web page: Printer Home Page > Directory Listing

Table 13 Tools Menu Items (Continued)

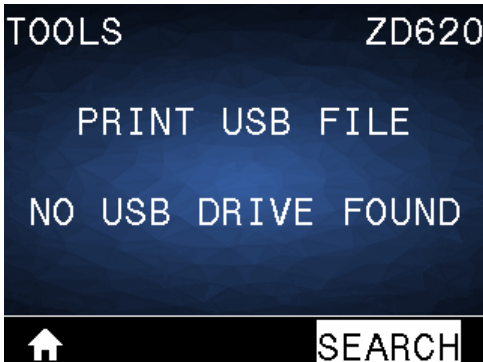
Setting	Description, Accepted Values, and Configuration Methods
PRINT USB FILE 	Select files to print from a USB Flash drive. See the exercises in Using the USB Host Port and Near Field Communication (NFC) Capabilities on page 195 for an exercise using this capability. To print files from a USB Flash drive: 1. Insert a USB Flash drive into the printer's USB host port. The printer lists available files. SELECT ALL is available to print all available files on the USB Flash drive. 2. Use the UP ARROW or DOWN ARROW to select a file from this menu. 3. Press RIGHT SELECT to select PRINT. Accepted values: • NONE • SELECT ALL • PROGRAM FILE NAMES Related ZPL command(s): None SGD command used: <code>usb.host.read_list</code> Print Server web page: None
COPY USB FILE TO E: 	Select files to copy to the printer from a USB Flash drive. See the exercises in Using the USB Host Port and Near Field Communication (NFC) Capabilities on page 195 for an exercise using this capability. To copy files to the printer from a USB Flash drive: • Insert a USB flash drive into the printer's USB host port. The printer lists available files. SELECT ALL is available to copy all available files from the USB Flash drive. • Use the UP ARROW or DOWN ARROW to select a file from this menu. • Press RIGHT SELECT to select STORE. Accepted values: • NONE • SELECT ALL • PROGRAM FILE NAMES SGD command used: <code>usb.host.read_list</code> Print Server web page: None

Table 13 Tools Menu Items (Continued)

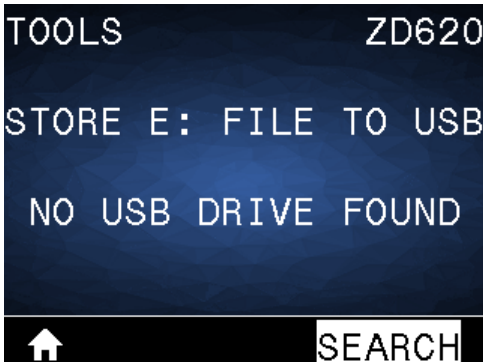
Setting	Description, Accepted Values, and Configuration Methods
STORE E: FILE TO USB  The screenshot shows a printer's LCD screen with a dark background. At the top, it says 'TOOLS' on the left and 'ZD620' on the right. Below that, the menu item 'STORE E: FILE TO USB' is displayed. Further down, the message 'NO USB DRIVE FOUND' is shown. At the bottom of the screen, there is a navigation bar with a white home icon on the left and the word 'SEARCH' on the right.	Select files from the printer to store on a USB Flash drive. See the exercises in Using the USB Host Port and Near Field Communication (NFC) Capabilities on page 195 for an exercise using this capability. To copy files from the printer to a USB Flash drive: • Verify that a USB flash drive is inserted into the printer's USB host port. The printer lists available files. SELECT ALL is available to store all files available from the printer on the USB Flash drive. • Use the UP ARROW or DOWN ARROW to select a file from this menu. • Press RIGHT SELECT to select STORE. Accepted values: • NONE • SELECT ALL • PROGRAM FILE NAMES SGD command used: <code>usb.host.write_list</code>

Table 13 Tools Menu Items (Continued)

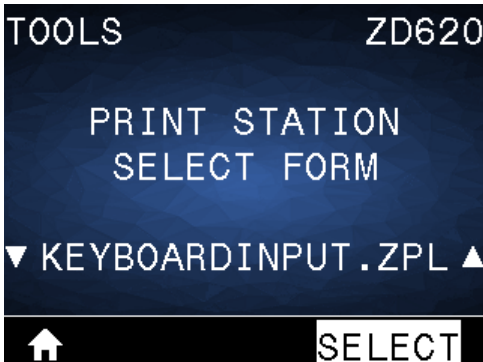
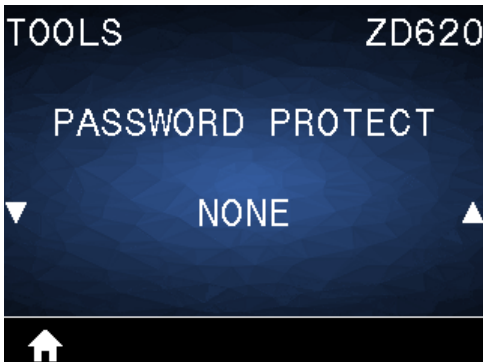
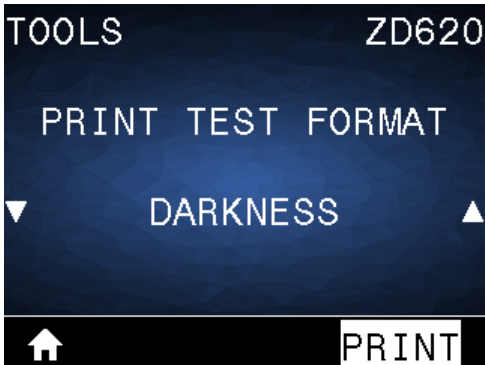
Setting	Description, Accepted Values, and Configuration Methods
PRINT STATION 	Use this menu item to fill in variable fields in a label format and print the label using a Human Input Device (HID), such as a USB keyboard, scale, or barcode scanner. A suitable label format must be stored on the E: drive of the printer to use this option. See the exercises in Using the USB Host Port and Near Field Communication (NFC) Capabilities on page 195. When you plug an HID into one of the printer's USB host ports, use this user menu to select a form on the printer's E: drive. After you have been prompted to fill in each variable ^FN field on the form, you can specify the desired quantity of labels to print. For more information about using the ^FN command or the SGD commands related to this feature, refer to the ZPL Programming Guide. Use one of the product information site links listed in About this Guide on page 11 to download this information. SGD command(s) used: - usb.host.keyboard_input (must be set to ON) - usb.host.template_list - usb.host.fn_field_list - usb.host.fn_field_data - usb.host.fn_last_field - usb.host.template_print_amount
PASSWORD PROTECT 	Select the level of password protection for user menu items. The default password is 1234. Accepted values: - NONE - SELECTED - ALL Related ZPL command(s): ^KP (to change the printer password)

Table 13 Tools Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
PRINT TEST FORMAT 	Use this menu item to initiate test sequences that print specific types of labels to help you troubleshoot printing issues. Accepted values: • DARKNESS—Runs a repeated image in incrementing darkness levels. • FIRST DOT LOCATION—Identifies the first dot location and label top to assist you with adjusting the position of the label. • PRINT LINE—Initiates a test sequence. • IMAGE COMPRESSION—Prints an image with lines and circles to assist with issues regarding compression or stretching of an image. • ELEMENT OUT—Prints a horizontal image designed to show printhead elements that are not functioning. SGD commands used: • <code>print.troubleshooting_label_choices</code> (specifies the type of label) • <code>print.troubleshooting_label_print</code> (prints the label)

Network Menu

This table describes the Network menu items.

Table 14 Network Menu Items

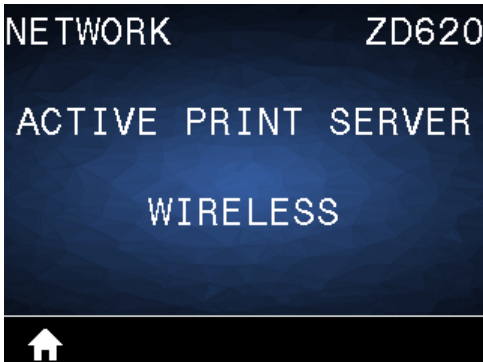
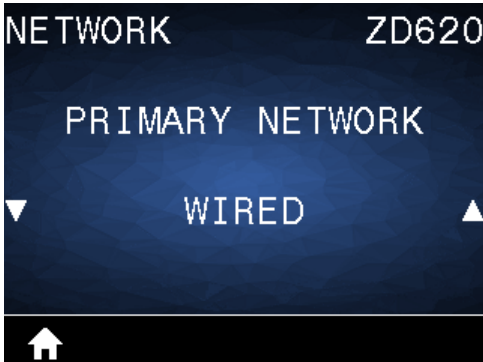
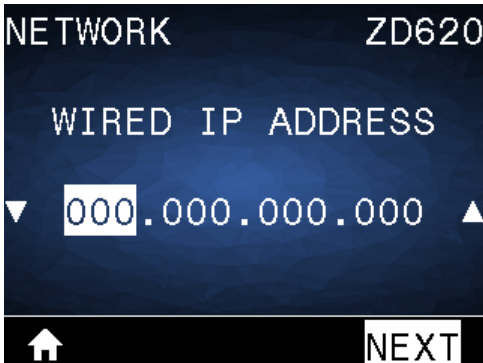
Setting	Description, Accepted Values, and Configuration Methods
ACTIVE PRINT SERVER 	View whether the WIRED or WIRELESS print server is currently active.
PRIMARY NETWORK 	View or modify whether the WIRED or WIRELESS print server is considered primary. You may select which one is primary. Accepted values: • WIRED • WIRELESS SGD command used: <code>ip.primary_network</code>
WIRED IP ADDRESS 	View and, if necessary, change the printer's Wired IP Address. To save changes to this setting, set WIRED IP PROTOCOL to PERMANENT, and then reset the print server (see RESET NETWORK in this table). Accepted values: 000 to 255 for each field Related ZPL command(s): <code>^ND</code> SGD command used: <code>internal_wired.ip.addr</code> Print Server web page: View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings

Table 14 Network Menu Items (Continued)

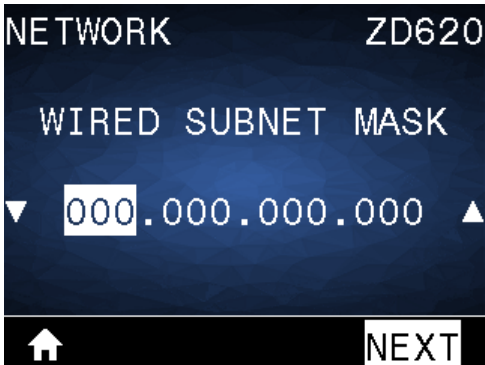
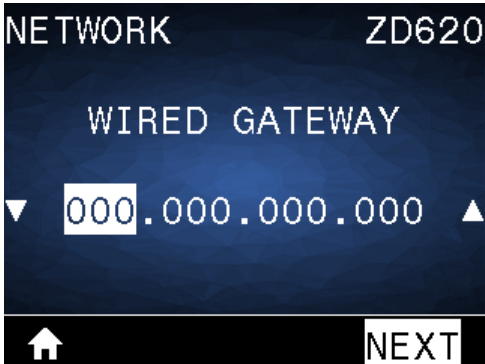
Setting	Description, Accepted Values, and Configuration Methods
WIRED SUBNET MASK 	View and, if necessary, change the wired subnet mask. To save changes to this setting, set WIRED IP PROTOCOL to PERMANENT, and then reset the print server (see RESET NETWORK in this table). Accepted values: 000 to 255 for each field Related ZPL command(s): ^ND SGD command used: internal_wired.ip.netmask Print Server web page: View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings
WIRED GATEWAY 	View and, if necessary, change the default wired gateway. To save changes to this setting, set WIRED IP PROTOCOL to PERMANENT, and then reset the print server (see RESET NETWORK in this table). Accepted values: 000 to 255 for each field Related ZPL command(s): ^ND SGD command used: internal_wired.ip.gateway Print Server web page: View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings

Table 14 Network Menu Items (Continued)

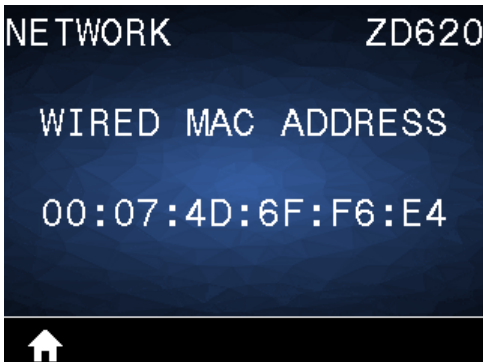
Setting	Description, Accepted Values, and Configuration Methods
WIRED IP PROTOCOL 	This parameter indicates if the Net Administrator/ User (permanent) or the server (dynamic) selects the Wired print server's IP address. When a dynamic option is chosen, this parameter tells the method(s) by which this print server receives the IP address from the server.  NOTE: The print server must be reset to allow changes to the network settings to take effect. Accepted values: • ALL • GLEANING ONLY • RARP • BOOTP • DHCP • DHCP & BOOTP • PERMANENT Related ZPL command(s): ^ND SGD command used: internal_wired.ip.protocol Print Server web page: View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings
WIRED MAC ADDRESS 	View the Media Access Control (MAC) address of the wired print server. SGD command used: internal_wired.mac_addr Print Server web page: View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings

Table 14 Network Menu Items (Continued)

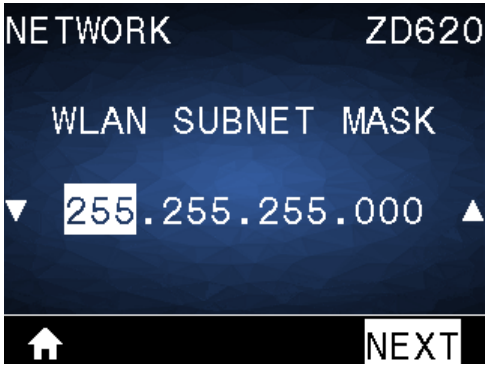
Setting	Description, Accepted Values, and Configuration Methods
WLAN IP ADDRESS 	View and, if necessary, change the printer's Wireless IP address. To save changes to this setting, set WLAN IP PROTOCOL to PERMANENT, and then reset the print server (see RESET NETWORK in this table). Accepted values: 000 to 255 for each field Related ZPL command(s): ^ND SGD command used: - ip.addr - wlan.ip.addr Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Setup
WLAN SUBNET MASK 	View and, if necessary, change the Wireless subnet mask. To save changes to this setting, set WLAN IP PROTOCOL to PERMANENT, and then reset the print server (see RESET NETWORK in this table). Accepted values: 000 to 255 for each field Related ZPL command(s): ^ND SGD command used: Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Settings
WLAN GATEWAY 	View and, if necessary, change the default wireless gateway. To save changes to this setting, set WLAN IP PROTOCOL to PERMANENT, and then reset the print server (see RESET NETWORK in this table). Accepted values: 000 to 255 for each field Related ZPL command(s): ^ND SGD command used: wlan.ip.gateway Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Setup

Table 14 Network Menu Items (Continued)

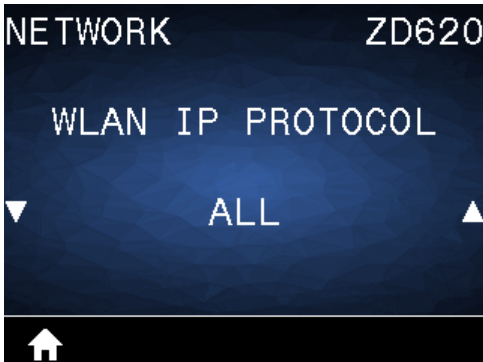
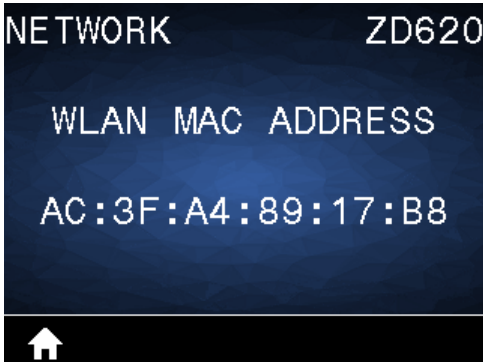
Setting	Description, Accepted Values, and Configuration Methods
WLAN IP PROTOCOL 	This parameter indicates if the Net Administrator/ User (permanent) or the server (dynamic) selects the Wireless print server's IP address. When a dynamic option is chosen, this parameter tells the method(s) by which this print server receives the IP address from the server. Important • The print server must be reset to allow changes to the network settings to take effect. Accepted values: • ALL • GLEANING ONLY • RARP • BOOTP • DHCP • DHCP & BOOTP • PERMANENT Related ZPL command(s): ^ND SGD command used: wlan.ip.protocol Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Setup
WLAN MAC ADDRESS 	View the Media Access Control (MAC) address of the wireless print server. SGD command used: wlan.mac_addr Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Setup

Table 14 Network Menu Items (Continued)

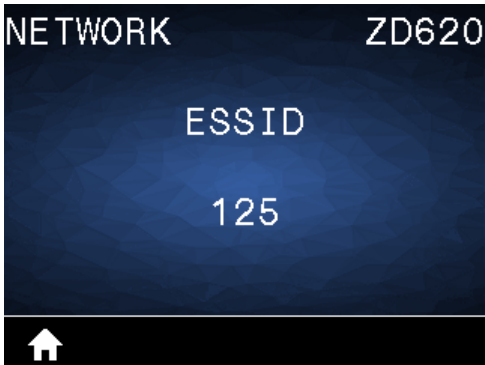
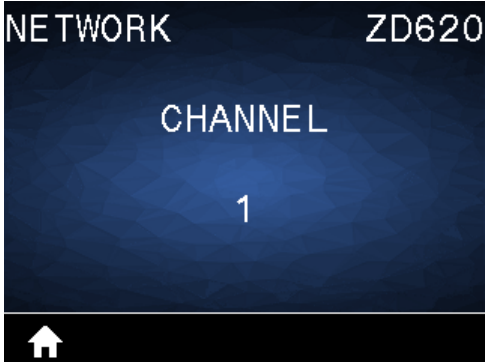
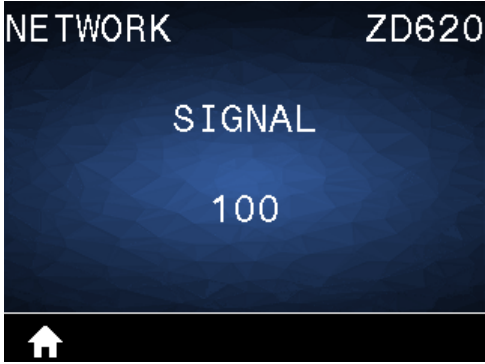
Setting	Description, Accepted Values, and Configuration Methods
ESSID 	The Extended Service Set Identification (ESSID) is an identifier for your wireless network. This setting, which cannot be modified from the user interface, gives the ESSID for the current wireless configuration. Accepted values: 32-character alphanumeric string (default 125) SGD command used: wlan.mac_addr Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Setup
CHANNEL 	View the wireless channel being used when the wireless network is active and authenticated. SGD command used: wlan.channel Print Server web page: Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Setup
SIGNAL 	View the wireless signal strength when the wireless network is active and authenticated. SGD command used: wlan.signal_strength Print Server web page: View and Modify Printer Settings > Network Communications Setup > Wireless Setup

Table 14 Network Menu Items (Continued)

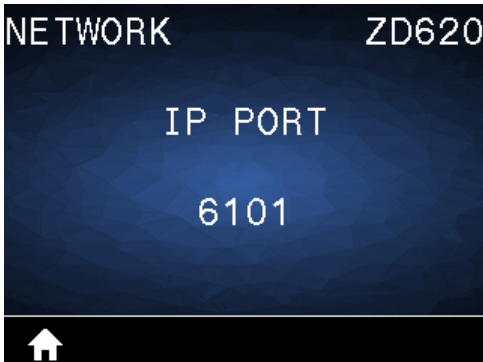
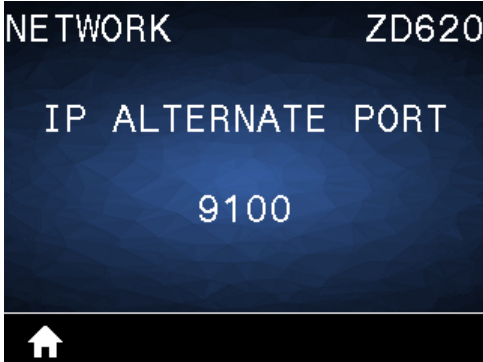
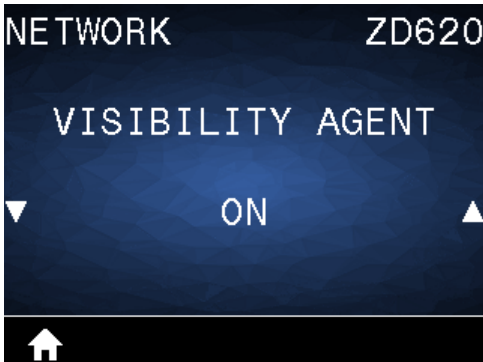
Setting	Description, Accepted Values, and Configuration Methods
IP PORT 	This printer setting refers to the internal wired print servers port number that the TCP print service is listening on. Normal TCP communications from the host should be directed to this port. SGD command used: internal_wired.ip.port Print Server web page: View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings
IP ALTERNATE PORT 	This command sets the port number of the alternate TCP port. SGD command used: internal_wired.ip.port_alternate Print Server web page: View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings  NOTE: Print servers supporting this command will simultaneously monitor both primary and alternate ports for connections.
RESET NETWORK 	Used to reset the wired or wireless print server and saves any changes that you made to any network settings.  IMPORTANT: When you change any network settings, the printer's internal print server must be reset for the changes to take effect. Related ZPL command(s): ~WR SGD command used: device.reset Print Server web page: Print Server Settings > Reset Print Server >

Table 14 Network Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
VISIBILITY AGENT 	When the printer is connected to a wired or wireless network, it will attempt to connect to Zebra's Asset Visibility Service via the Cloud-based Zebra Printer Connector using an encrypted, certificate-authenticated web socket connection. The printer sends Discovery Data and Settings and Alerts Data. Data printed via any label formats is NOT transmitted. To opt out of this feature, disable this setting. For more information, see the "Disabling the Visibility Agent" Application Note at zebra.com/support. Accepted values: • ON • OFF SGD command used: <code>weblink.zebra_connector.enable</code> Print Server web page: View and Modify Printer Settings > Network Configuration > Cloud Connect Settings

Battery Menu

This table describes the Battery menu item.

Table 15 Battery Menu Items

Setting	Description, Accepted Values, and Configuration Methods
BATTERY STATUS 	Display the status of the Battery subsystem of the printer. This menu item is decremented as final design of the battery does not include communicating to battery or this menu item. Accepted value: BATTERY NOT PRESENT

Language Menu

This table describes the Language menu items.

Table 16 Language Menu Items

Setting	Description, Accepted Values, and Configuration Methods
LANGUAGE 	Change the language that the printer displays as necessary. This change affects the text shown the Home menu, error messages, the printer configuration report, the network configuration report, and other reports that you can select to print through the user menus  NOTE: The print server must be reset to allow changes to the network settings to take effect. See RESET NETWORK in Network Menu on page 88. Accepted values: ENGLISH, SPANISH, FRENCH, GERMAN, ITALIAN, NORWEGIAN, PORTUGUESE, SWEDISH, DANISH, SPANISH 2, DUTCH, FINNISH, CZECH, JAPANESE, KOREAN, ROMANIAN, RUSSIAN, POLISH, SIMPLIFIED CHINESE, TRADITIONAL CHINESE The selections for this parameter listed above in English are displayed in the actual languages and alphabetized on the menu according to their native spellings to make it easier for you to find the one you can read and use. Related ZPL command(s): ^KL SGD command used: display . language Print Server web page: View and Modify Printer Settings > General Setup > Language
COMMAND LANGUAGE 	The setting allows you to control the primary programming language variations available, such as, EPL_ZPL, EPL (legacy language), and Hybrid_XML_ZPL (used for format/form variable fill-in with XML structured elements). Accepted values: • EPL_ZPL (EZPL) • Hybrid_XML_ZPL • EPL

Table 16 Language Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
COMMAND CHAR 	This menu item is used to change the format command prefix. The format command prefix is an ASCII (two-digit hexadecimal value shown in parenthesis) used as a parameter place marker in ZPL/ZPL II format instructions. The printer looks for this command character to indicate the start of a ZPL/ZPL II format instruction. Set the format command character to match what is used in your label formats.  NOTE: You will not be able to use the same hexadecimal value for the format command prefix, control character, or delimiter characters. The printer must see different characters to work properly. If you are setting the value through the interface, the printer will skip any value that is already in use. Accepted values: 00 to FF hexadecimal Related ZPL command(s): • ^CC • ~CC SGD command used: <code>zpl.caret</code> Print Server web page: View and Modify Printer Settings > ZPL Control

Table 16 Language Menu Items (Continued)

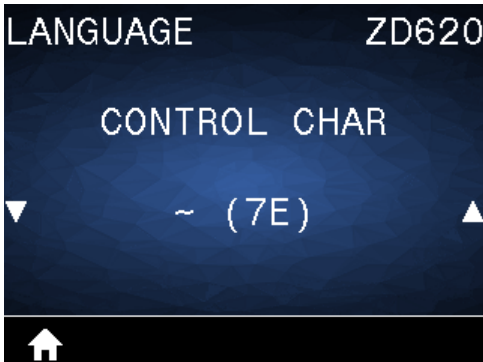
Setting	Description, Accepted Values, and Configuration Methods
CONTROL CHAR 	This menu item is used to change the control command prefix. The default prefix is the tilde (~). The printer looks for this character to indicate the start of a ZPL/ZPL II command. Set the format prefix character to match what is used in your label formats. The control command prefix is an ASCII (two-digit hexadecimal value shown in parenthesis) used as a parameter place marker in ZPL/ZPL II control instructions.  NOTE: You will not be able to use the same hexadecimal value for the format command prefix, control character, or delimiter characters. The printer must see different characters to work properly. If you are setting the value through the interface, the printer will skip any value that is already in use. Accepted values: 00 to FF hexadecimal Related ZPL command(s): • ^CT • ~CT SGD command used: <code>zpl.control_character</code> Print Server web page: View and Modify Printer Settings > ZPL Control

Table 16 Language Menu Items (Continued)

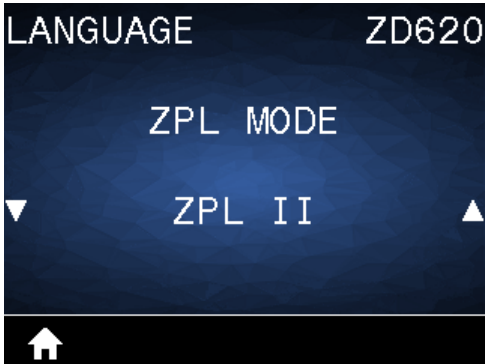
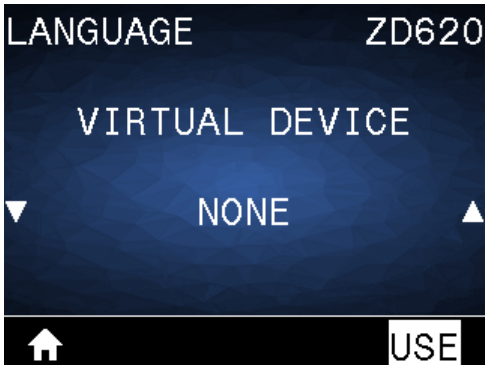
Setting	Description, Accepted Values, and Configuration Methods
DELIMITER CHAR 	This menu item is used to separate command parameters (command delimiter). The default prefix is the comma (,). The printer looks for this character to separate parts of ZPL/ZPL II commands. Set the delimiter character to match what is used in your label formats. The delimiter command prefix is an ASCII (two-digit hexadecimal value shown in parenthesis) used as a parameter place marker in ZPL/ZPL II control instructions.  NOTE: You will not be able to use the same hexadecimal value for the format command prefix, control character, or delimiter characters. The printer must see different characters to work properly. If you are setting the value through the interface, the printer will skip any value that is already in use. Accepted values: 00 to FF hexadecimal Related ZPL command(s): • ^CD • ~CD SGD command used: <code>zpl.delimiter</code> Print Server web page: View and Modify Printer Settings > ZPL Control
ZPL MODE 	Select the mode that matches what is used in your label formats. This printer accepts label formats written in either ZPL or ZPL II, eliminating the need to rewrite any ZPL formats that already exist. The printer remains in the selected mode until it is changed in one of the ways listed here. Accepted values: • ZPL II • ZPL Related ZPL command(s): ^SZ SGD command used: <code>zpl.zpl_mode</code> Print Server web page: View and Modify Printer Settings > ZPL Control

Table 16 Language Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
VIRTUAL DEVICE 	If any Link-OS Virtual Device apps are installed on your printer, you may view or enable/disable them from this user menu. For more information about Virtual Devices, go to the User Guide for the appropriate Virtual Device, or contact your local reseller.

Sensors Menu

This table describes the Sensors menu items.

Table 17 Sensor Menu Items

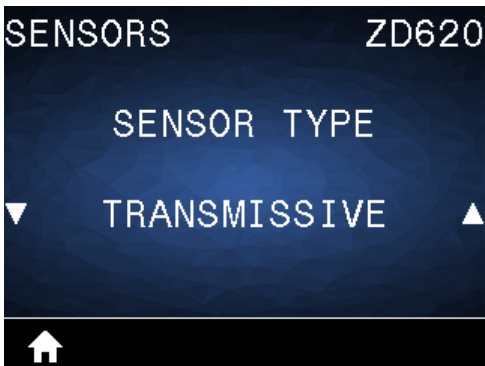
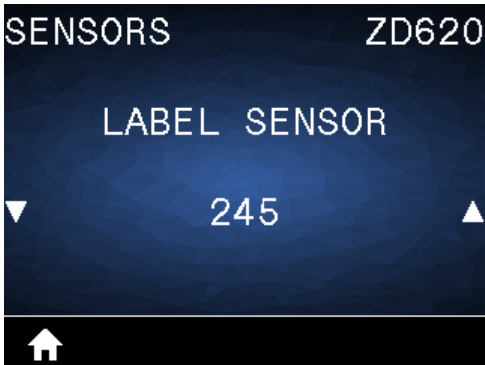
Setting	Description, Accepted Values, and Configuration Methods
SENSOR TYPE 	Select the media sensor that is appropriate for the media that you are using. The reflective sensor typically is used only for black mark media. The transmissive sensor typically is used for other media types. Accepted values: • TRANSMISSIVE • REFLECTIVE Related ZPL command(s): ^JS SGD command used: device.sensor_select Print Server web page: View and Modify Printer Settings > Media Setup

Table 17 Sensor Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
LABEL SENSOR 	Set the sensitivity of the label sensor.  IMPORTANT: This value is set during sensor calibration. Do NOT change this setting unless you are told to do so by Zebra Technical Support or by an authorized service technician. Acceptable values: 0 to 255 SGD command used: <code>ezpl.label_sensor</code> Print Server web page: View and Modify Printer Settings > Calibration
TAKE LABEL 	Set the intensity of the label taken sensor circuit.  IMPORTANT: This value is set during sensor calibration. Do NOT change this setting unless you are told to do so by Zebra Technical Support or by an authorized service technician. Accepted values: 0 to 255 SGD command used: <code>ezpl.take_label</code> Print Server web page: View and Modify Printer Settings > Calibration

Ports Menu

This table describes the Ports menu items.

Table 18 Ports Menu Items

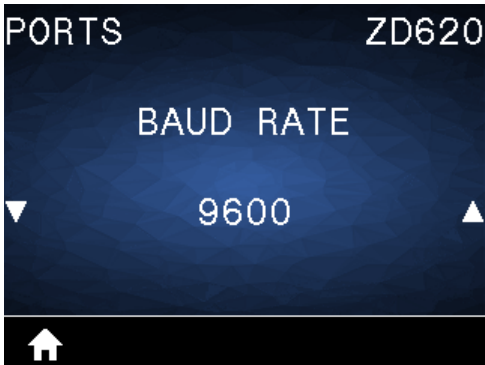
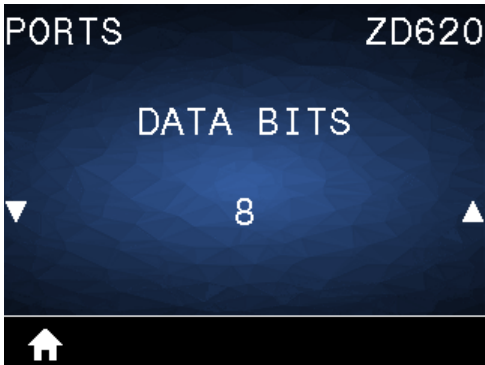
Setting	Description, Accepted Values, and Configuration Methods
BAUD RATE 	Select the baud value that matches the one being used by the host computer. Accepted values: • 115200 • 57600 • 38400 • 28800 • 19200 • 14400 • 9600 • 4800 Related ZPL command(s): ^SC SGD command used: comm.baud Print Server web page: View and Modify Printer Settings > Serial Communications Setup
DATA BITS 	Select the data bits value that matches the one being used by the host computer. Acceptable values: 7 or 8 Related ZPL command(s): ^SC SGD command used: comm.data_bits Print Server web page: View and Modify Printer Settings > Serial Communications Setup
PARITY 	Select the parity value that matches the one being used by the host computer. Accepted values: • NONE • EVEN • ODD Related ZPL command(s): SGD command used: ^SC Print Server web page: View and Modify Printer Settings > Serial Communications Setup

Table 18 Ports Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
HOST HANDSHAKE 	Select the handshake protocol that matches the one being used by the host computer. Accepted values: • XON/XOFF • RTS/CTS • DSR/DTR Related ZPL command(s): ^sc SGD command used: comm.handshake Print Server web page: View and Modify Printer Settings > Serial Communications Setup
WML 	View the Wireless Markup Language (WML) version. This value cannot be changed.

Bluetooth Menu

This table describes the Bluetooth menu items.

Table 19 Bluetooth Menu Items

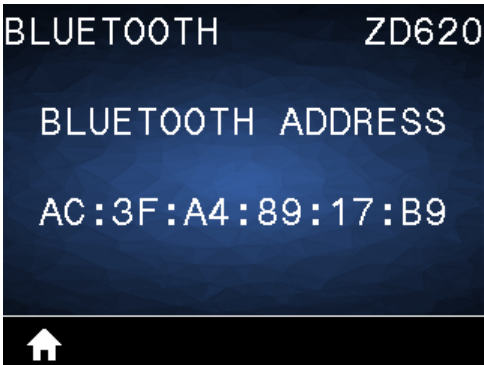
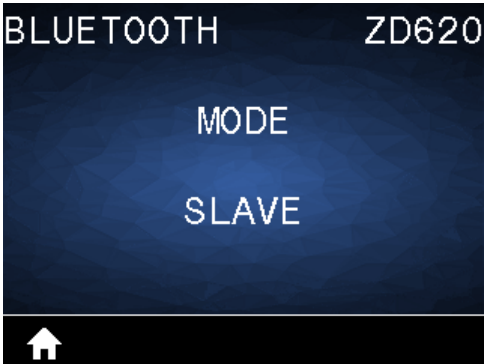
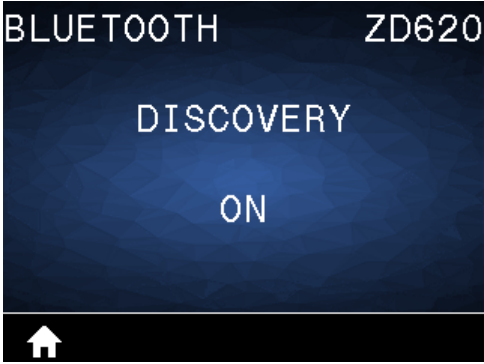
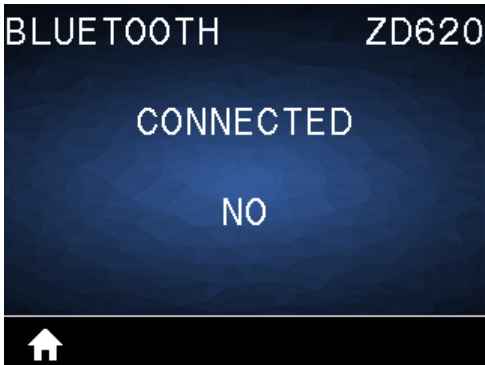
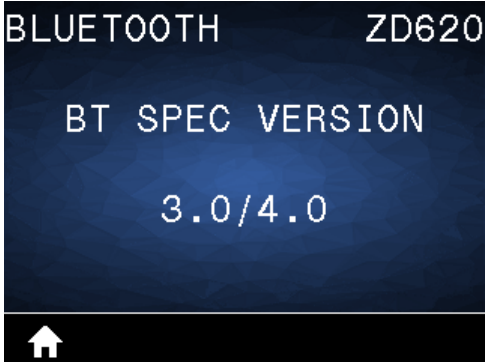
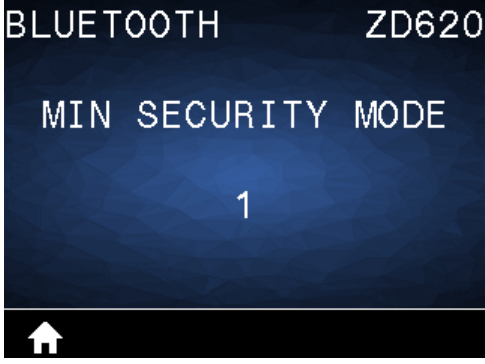
Setting	Description, Accepted Values, and Configuration Methods
BLUETOOTH ADDRESS 	View the printer's Bluetooth MAC Address SGD command used: <code>bluetooth.address</code>
MODE 	View the Bluetooth connection pair printer's device type—Peripheral (formerly SLAVE, typical connection mode) or Central.
DISCOVERY 	Select if the printer is "Discoverable" for Bluetooth device pairing. Accepted values: • ON—Enables Bluetooth discoverable mode. • OFF—Disables Bluetooth discoverable mode. SGD command used: <code>bluetooth.discoverable</code>

Table 19 Bluetooth Menu Items (Continued)

Setting	Description, Accepted Values, and Configuration Methods
CONNECTED  The screenshot shows a dark blue background with white text. At the top, 'BLUETOOTH' is on the left and 'ZD620' is on the right. In the center, 'CONNECTED' is displayed above 'NO'. At the bottom, there is a white house icon on a black bar.	View the Bluetooth connection status to its paired device (Yes or No).
BT SPEC VERSION  The screenshot shows a dark blue background with white text. At the top, 'BLUETOOTH' is on the left and 'ZD620' is on the right. In the center, 'BT SPEC VERSION' is displayed above '3.0/4.0'. At the bottom, there is a white house icon on a black bar.	View the Bluetooth operational specification level. SGD command used: <code>bluetooth.radio_version</code>
MIN SECURITY MODE  The screenshot shows a dark blue background with white text. At the top, 'BLUETOOTH' is on the left and 'ZD620' is on the right. In the center, 'MIN SECURITY MODE' is displayed above '1'. At the bottom, there is a white house icon on a black bar.	View the printer's Bluetooth minimum level of applied security.

Setup

This section assists you in setting up and operating your printer. The setup process can be broken down into two phases: hardware setup and host system (software/driver) setup. This section covers the physical hardware setup needed to print your first label.

Printer Setup Overview

Review this overview and prepare for the setup before you begin the physical printer setup.

- Install any printer hardware options first. See [Install Hardware Options](#) on page 37.
- Place the printer in a safe location with access to power and where you can connect interface cables or wirelessly to the system.
- Attach the printer and power supply to a grounded AC power source. See [Attaching the Printer to Power](#) on page 109.
- Select and prepare media for your printer. See [Media](#) on page 288.
- Load the media. See [Loading Media](#) on page 111.
- Turn printer power ON.
- Calibrate the printer for the media. See [Running a SmartCal Media Calibration](#) on page 130.
- Print a Configuration Report to verify basic printer operation. See [Printing the Printer and Network Configuration Reports \(CANCEL Self Test\)](#) on page 244.
- Turn printer power OFF.
- Choose a method to communicate via a wired or wireless connection to your printer. Available wired local connections are:
 - USB port
 - Optional serial port
 - Ethernet (LAN) (option available for your printer)
- Attach the printer cable to the network or host system (with printer power OFF).
- Begin second phase of printer setup: typically [Setup for Windows](#) on page 146.

Select a Location for the Printer

The printer and media need a clean and safe area with moderate temperatures for optimal print operations.

Select a location for the printer that meets these conditions:

Condition	Description
Surface	Must be solid, level, and of sufficient size and strength to hold the printer with media.
Space	The operating location for the printer must include enough space to open the printer (for media access and cleaning), and enable access to connectivity and power cords. Leave open space on all sides of the printer to allow for proper ventilation and cooling.  IMPORTANT: Do not place any padding or cushioning material under or around the base of the printer because this will restrict airflow and could cause the printer to overheat.
Power	Situate the printer within easy access of a power outlet.
Data communication interfaces	Ensure that cabling and Wi-Fi or Bluetooth radios do NOT exceed the maximum distance specified by the communication protocol standard or product data sheet for this printer. Radio signal strength can be reduced by physical barriers (objects, walls, etc.).
Data cables	Cables should not be routed with or near power cords or conduits, fluorescent lighting, transformers, microwave ovens, motors or other sources of electrical noise and interference. These interference sources may cause problems with communications, host system operation, and printer functionality.
Operating conditions	Your printer is designed to function in a wide range of environments. - Operational temperature: 0°C to 40°C (32°F to 104°F) - Operational humidity: 20% to 85% non-condensing - Non-operational temperature: -40°C to 60°C (-40°F to 140°F) - Non-operational humidity: 5% to 85% non-condensing

Install Printer Options and Connectivity Modules

Install the following printer options before proceeding with the printer's setup.

- Serial (RS-232 DB-9) Port Module — See [Installing the Serial Port Module](#) on page 39.
- Internal Ethernet (LAN) Module — See [Installing the Internal Ethernet \(LAN\) Module](#) on page 40.
- Label Dispenser (automatically peels the liner off the label and dispenses the label) — See [Installing the Label Dispenser](#) on page 43.
- Linerless (standard) Media Cutter — See [Installing the Standard Media Cutter](#) on page 44.
- Linerless Media Tear-Off Bezel — See [Installing the Linerless Media Tear-Off Bezel](#) on page 46.
- Standard (general purpose) media cutter — See [Installing the Standard Media Cutter](#) on page 44.

- Media Roll Core Size Adapters for 38.1 mm (1.5 in.), 50.8 mm (2.0 in.), or 76.2 (3.0 in.) I.D. media cores. — For information on these adapters, see [Media Roll Core Size Adapters](#) on page 47. To install the adapters, see [Installing Media Roll Adapters](#) on page 48.
- Print Resolution Upgrade Kits (200 and 300 dpi for standard and linerless media) — For information on these upgrade kits, see [Print Resolution Upgrade Kits](#) on page 49. To install these kits, see [Installing the Printhead Resolution Upgrade Kits](#) on page 50.

Attaching the Printer to Power



CAUTION: Never operate the printer and power supply in an area where they can get wet. Serious personal injury could result!



IMPORTANT: Ensure the appropriate power cord with a three-prong plug and an IEC 60320-C13 connector are used at all times. These power cords must bear the relevant certification mark of the country in which the product is being used.

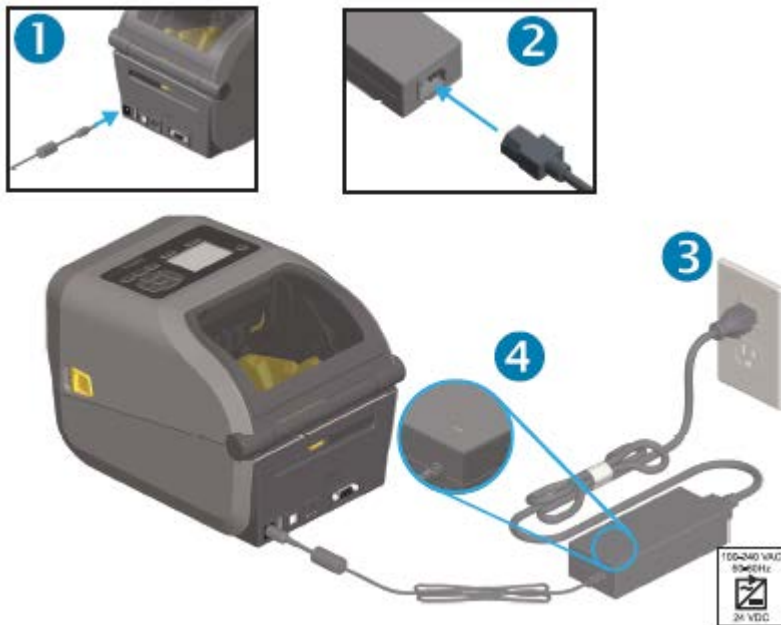
Set up your printer so that you can handle the power cord easily if needed. Some processes for setup or troubleshooting issues may ask you to remove power. Separate the power cord from the power supply receptacle or AC electrical outlet to make certain the printer cannot carry electrical current.

1. Plug the power supply into the printer's DC power receptacle.
2. Insert the AC power cord into the power supply.
3. Plug the other end of the AC power cord into an appropriate AC electrical outlet.



NOTE: The AC outlet end of the power cord's plug type can vary by region.

The active power light will turn on green if power is on at the AC outlet.



Getting Ready to Print

You will need media to complete the printer setup. Media does not ship with the printer.

For media, you can use labels, tags, tickets, receipt paper, fanfold stacks, tamper proof labels or other print media formats. Use the Zebra web site or your reseller may be able to help you select the right media for your intended printing application. To procure media that is specifically designed for use with your Zebra printer, see zebra.com/supplies.

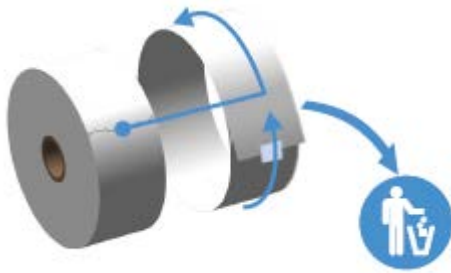
During setup, use the same media that you would use for normal printer operation. This will help you identify any setup or real-life application issues and address them right at the start.

Preparing and Handling Media

Careful handling and storage of your media is important in order to maximize print quality. If the media becomes contaminated or dirty, it can damage the printer and cause defects in the printed image (voids, streaks, discoloration, compromise the adhesive, etc.).



IMPORTANT: During manufacturing, packaging, handling and storage, the outside length of media may become dirty or contaminated. We recommend removing the outside layer of the media roll or stack. This will remove any contaminants which might be transferred onto the printhead during normal operation.



Media Storage Guidelines

Follow these media storage guidelines for optimal print output.

- Store media in a clean, dry, cool, dark area.



NOTE: Direct thermal media is chemically treated to be heat-sensitive. Direct sunlight or heat sources may 'expose' the media.

- Do NOT store media with chemicals or cleaning products.
- Leave media in its protective packaging until the time it will be loaded into the printer.
- Many media types and label adhesives have a 'shelf life' or expiration date. Always use the oldest, viable (non-expired) media first.

Loading Roll Media

All of the ZD620 and ZD420 4 inch Link-OS printers load print media rolls the same.

The printers support the three basic types of media:

- Continuous (receipt, etc.) with no marks to define print length.

- Marked media (black lines, black marks, notches, or holes) to define print length
- Label media that uses the sensor to look through the media backing (liner) to see the beginning and end of labels on the roll.

The printer utilizes two sensing methods to accommodate a wide range of media:

- Center-area transmissive sensing for continuous media and gap/web label media.
- Full-width movable (reflective) sensing for print format (length) using black marks, black lines, notches, or holes.

Setting Media Sensing by Media type

- For web/gap media, the printer senses the differences between the label and the liner to determine the print format length.
- For continuous roll media, the printer only senses the media's characteristics. The print format's length is set by programming (driver or software) or the last stored form's length.
- For black mark media, the printer senses the beginning of the mark and the distance to the start of the next black mark to measure the print format length.
- For other common media and setting variations:
 - After you have loaded media using this procedure, see [Using the Label Dispenser Option](#) on page 177.
 - See [Printing on Fanfold Media](#) on page 175.

Loading Media

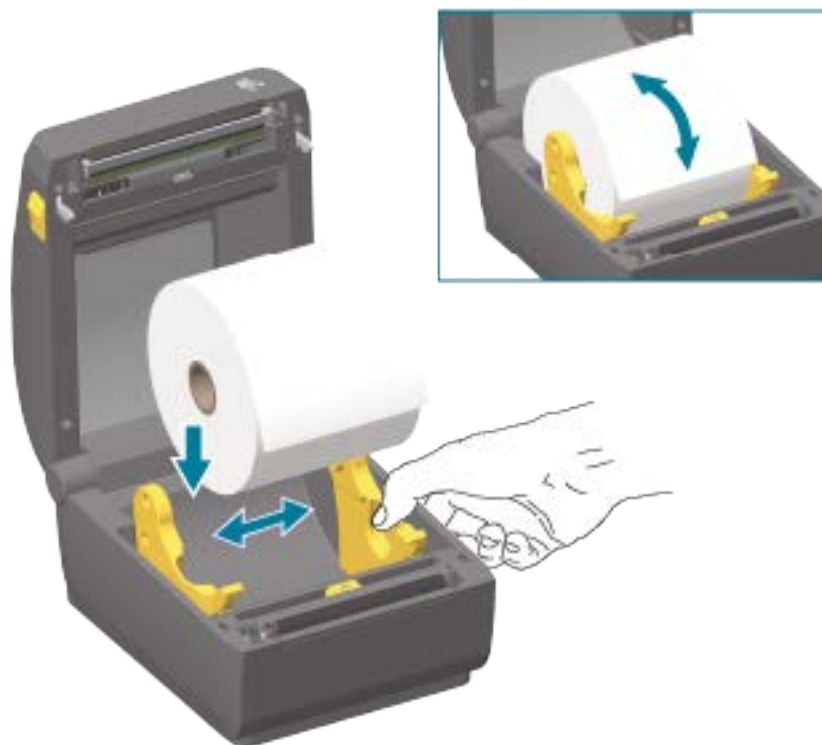
This procedure works for Tear-Off (standard bezel), Label Dispense, and Media Cutting printer options.

1. Open the printer. Pull the release latch levers toward the front of the printer.



2. Open the media roll holders. Orient the media roll so that its printing surface will face up as it passes over the platen (drive) roller. Pull the media guides open with your free hand and place the media roll on

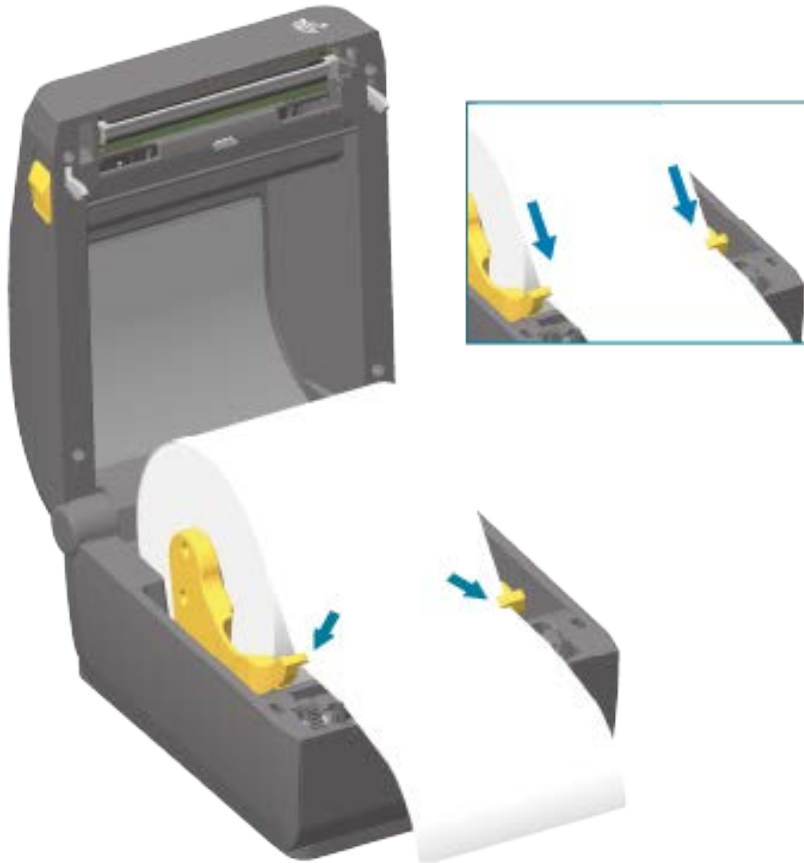
the roll holders and release the guides. Verify the roll turns freely. The roll must not sit in the bottom of the media compartment.



3. Pull the media so that it extends out of the front of the printer.



4. Push the media under both of the media guides.

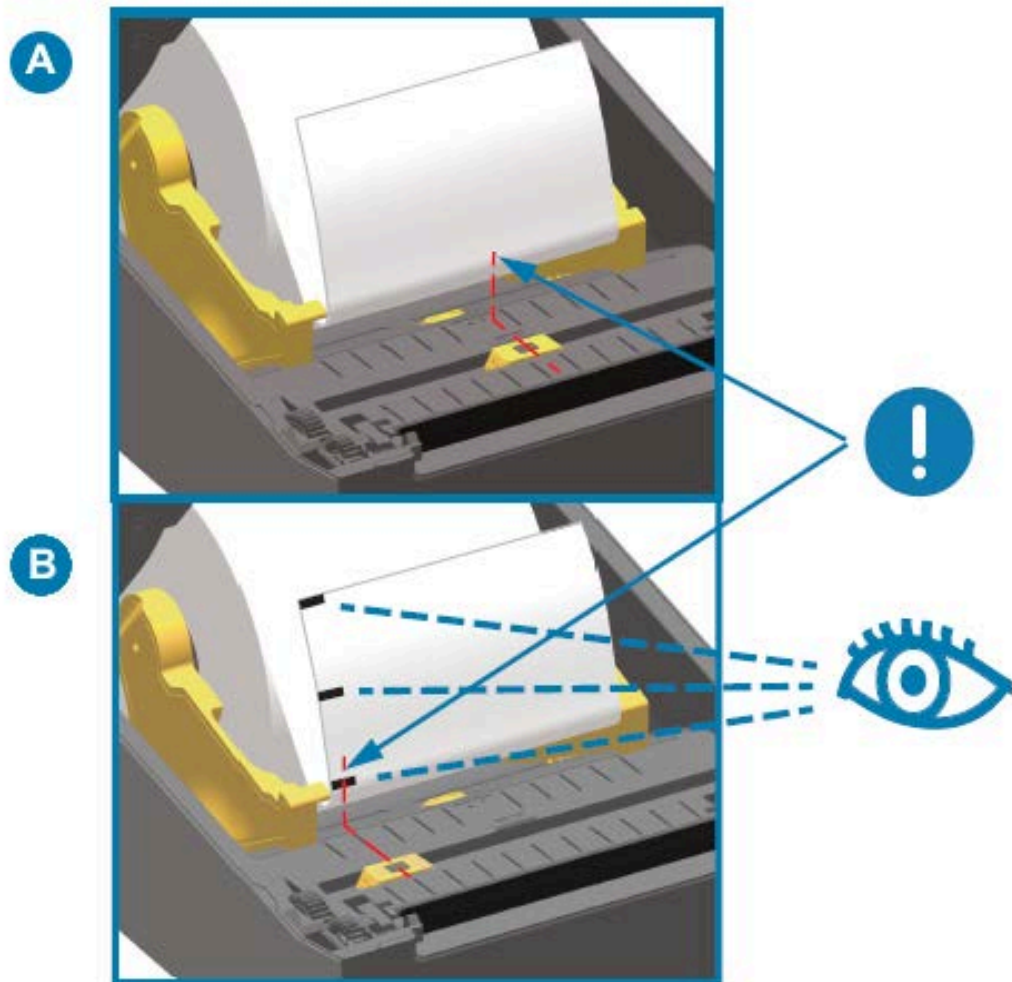


5. Flip the media up and align the movable media sensor as appropriate for your media type.

For continuous roll receipt-type media and for label media without black marks or notches...	Align the media to the default center position.
--	---

For black mark (black line, notches or holes), backed media...

Adjust the sensor position in such a way that the sensor aligns to the center of the black mark.
Avoid the center area of the media so you only use black-mark sensing for printing on black mark media.



A	Web (gap) sensing standard operating position for the sensor (default)
B	Off-center sensor position (use for black mark sensing only)

Movable Sensor

The movable sensor is a dual function sensor. It provides transmissive (sees through media) and reflective media sensing. The printer can use either sensing method, but not both at the same time.

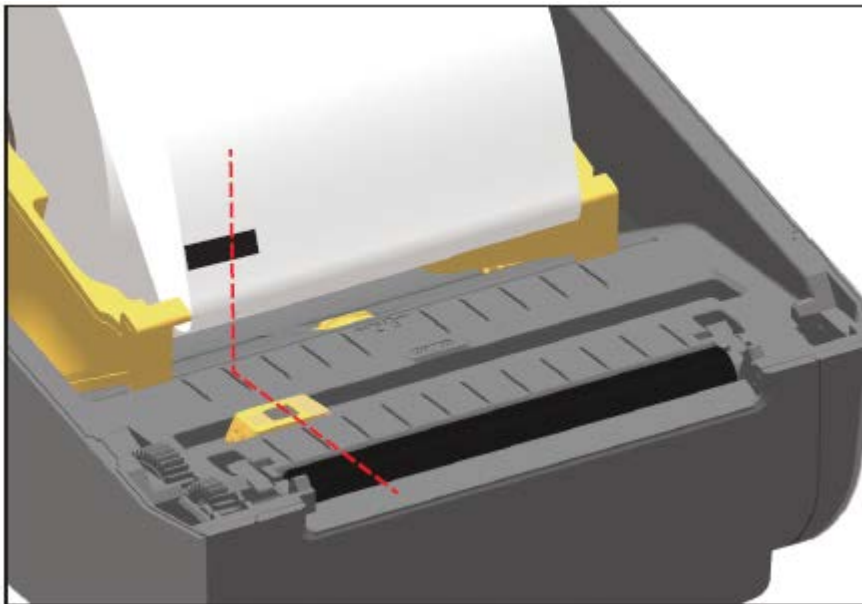
The movable sensor has a center array of sensors. This provides adjustable transmissive web (gap) sensing to positions that match legacy Zebra desktop printer sensor locations and positions in between. This also provides for use of some atypical media variations or irregularly shaped media.

The movable sensor allows the printer to use media with black marks or notches (holes through the media) on the back side of the media (or media liner). The sensor aligns to the middle of black marks or notches not in the center of the media roll to avoid web (gap) sensing array.

Adjusting the Movable Sensor for Black Marks or Notches

Black mark sensing looks for non-reflective surfaces such as black marks, black lines, notches or holes on the back of the media which do not reflect the sensor's near infrared light beam back to the sensor's detector. The sensor light and its black mark detector are next to each other under the sensor cover.

1. Position the movable sensor's alignment arrow to the middle of the black mark or notch in the underside of the media.
2. Verify that you have set the sensor alignment as far as possible from the edge of the media but where 100% of the sensor window is covered by the mark.



NOTE: When printing, the media can move from side to side $\pm 1\text{mm}$ (due to media variations and edge damage due to handling). Notches cut into the side of the media can also become damaged.

Adjusting the Movable Sensor for Web (Gap) Sensing

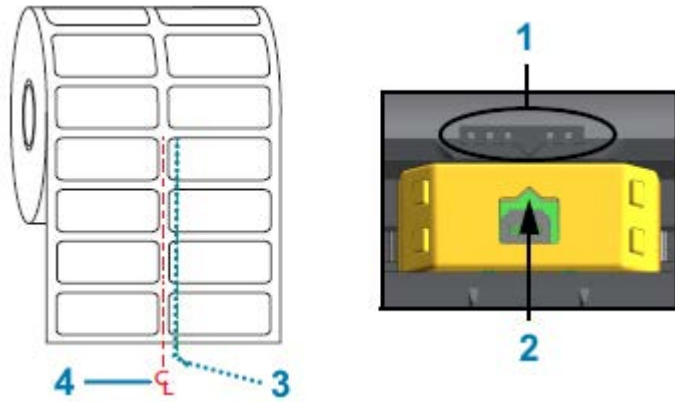
The movable sensor for web/gap sensing supports multiple positions.

The movable sensor's default position is ideal for printing on most label types.

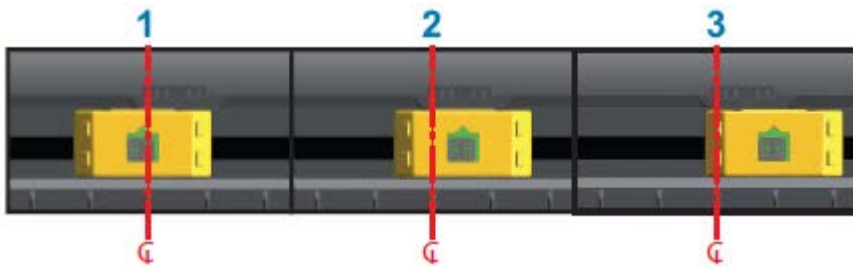
The adjustment range is from center to off-center positions. This adjustment is ideal for printing two labels side by side on a roll.

The movable sensor adjustment range covers sensor positions use by legacy Zebra printers.

Web (gap) sensing with the movable sensor only functions when the movable sensor's alignment arrow points to any position on the alignment key.



1	Alignment key
2	Alignment arrow (default position)
3	Default gap sensing position
4	Center line



1	Center-aligned sensing position
2	Default sensing position
3	Maximum right sensing position

The following are Zebra printer fixed sensor position relative to a ZD Series printer:

- Default — Zebra models G-Series fixed-position sensors: LP/TLP 2842, LP/TLP 2844, and LP/TLP 2042
- Center aligned — Zebra model LP/TLP 2742

Loading Roll Media for Cutter Models

If your printer has the optional cutter module installed, use these instructions to load roll media.

1. Thread the media through cutter's media slot and pull it out the front of the printer.



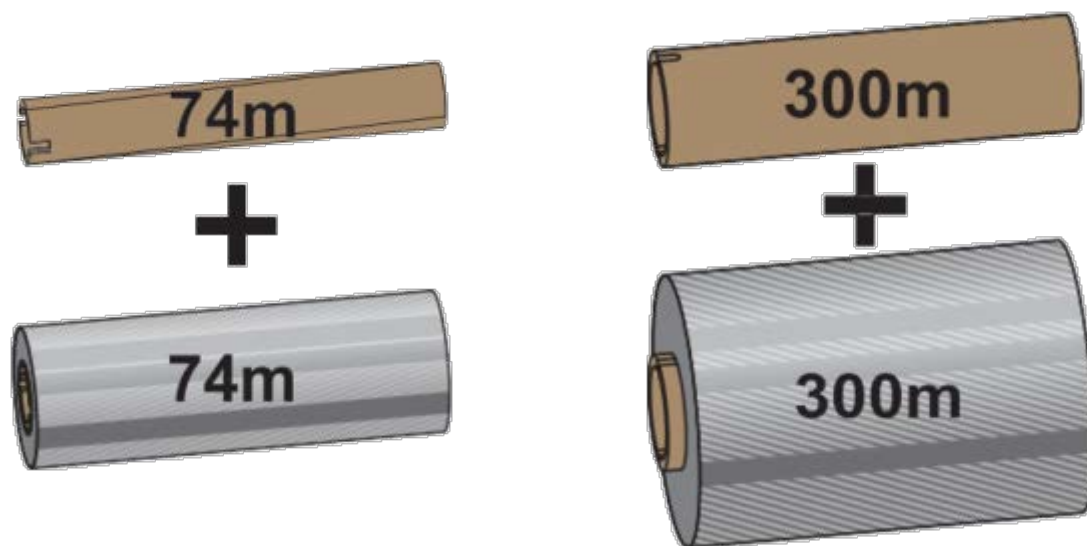
2. Close the printer. Press down until the cover snaps closed.



You may need to calibrate your printer for the media. (See [Running a SmartCal Media Calibration](#) on page 130.) The printer's sensors must adjust to sense the label, the liner, and the distance between labels to operate properly. When reloading the same media (size, vendor, and batch), you can simply press **FEED** (Advance) once to prepare the media for printing.

Loading Thermal Transfer Roll Ribbon

Thermal transfer printers have a flexible ribbon system that supports 74-meter and 300-meter ribbons manufactured by Zebra. Your printer ships with 300-meter ribbon adapters to support non-Zebra ribbon rolls. The 74-meter ribbon used with non-Zebra printers does NOT require non-Zebra ribbon adapters to operate properly.



Inner Diameter (I.D.) = 12.2 mm (0.5 in.)

I.D. = 25.4 mm (1.0 in.)

Transfer ribbons come in several varieties—and in some cases several colors—to match your application needs. Transfer ribbons manufactured by Zebra are specifically designed for use with your Zebra printer and Zebra brand media. For transfer ribbon rolls and other printing supplies, see zebra.com/supplies.



CAUTION—PRODUCT DAMAGE: Using non-Zebra media or ribbons that are NOT approved for use with your Zebra printer may damage your printer or printhead.

- To ensure optimal print results, match the media and ribbon types.
- To protect the printhead from wear, always use ribbon that is wider than the media.
- For printing on Direct Thermal media, do NOT load ribbon in the printer. (See [Determining Thermal Media Types](#) on page 288.)
- To avoid ribbon wrinkling and other print problems, always use an empty ribbon core that matches your transfer ribbon roll's inner diameter (I.D.).

Your printer requires ribbons manufactured by Zebra that have a ribbon-out trailer (reflector). When the printer senses this trailer, it recognizes that the transfer ribbon roll has been used up and it stops printing. In addition, ribbons and ribbon cores manufactured by Zebra include notches to help maintain ribbon-roll engagement and drive (without slipping) while printing.

Zebra-manufactured ribbons for your printer include:

- Performance Wax
- Premium Wax/Resin
- Performance Resin for synthetics (6 inches per second or ips maximum speed) and coated paper (4 ips maximum speed)
- Premium Resin for synthetics (4 ips maximum speed)



IMPORTANT: If using 74-meter ribbons, DO NOT pair them with early-model desktop printer ribbon cores! These older cores are too large. You can identify the older-style ribbon cores (and some Non-Zebra ribbons) by notches seen ONLY on one side of the ribbon core.



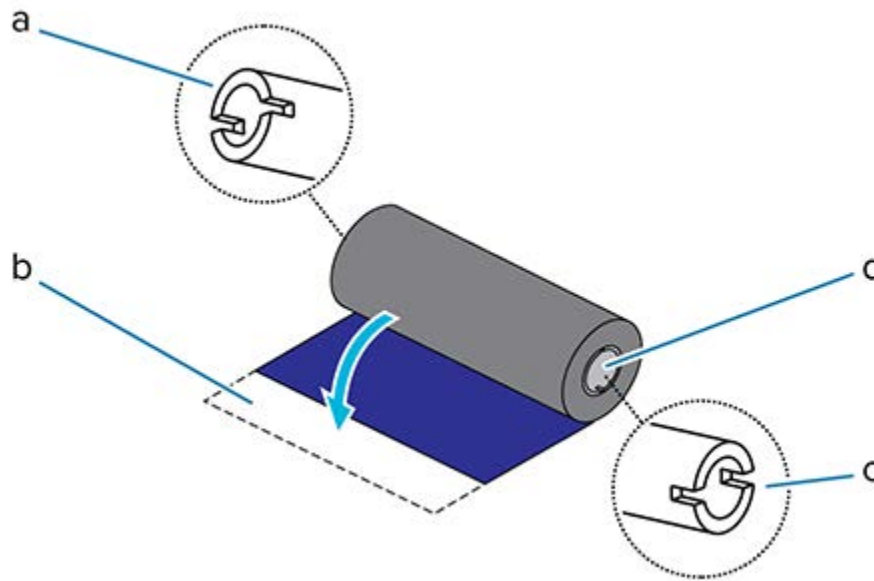
IMPORTANT: DO NOT use ribbon cores that have damaged notches (rounded, frayed, smashed, etc.) The core notches must be square to lock the core onto the spindle. Otherwise, the core may slip and cause ribbon wrinkle, poor end-of-ribbon sensing, or other intermittent failures.

Loading Zebra Transfer Roll Ribbon

Follows these steps to load the ribbon.

Prepare the ribbon by removing its wrapping and pulling its adhesive strip free.

Verify that the ribbon and empty ribbon core have notches on the left side of the ribbon cores as shown here. (If they do not, see [Loading Non-Zebra 300-Meter Transfer Ribbon](#) on page 122.)



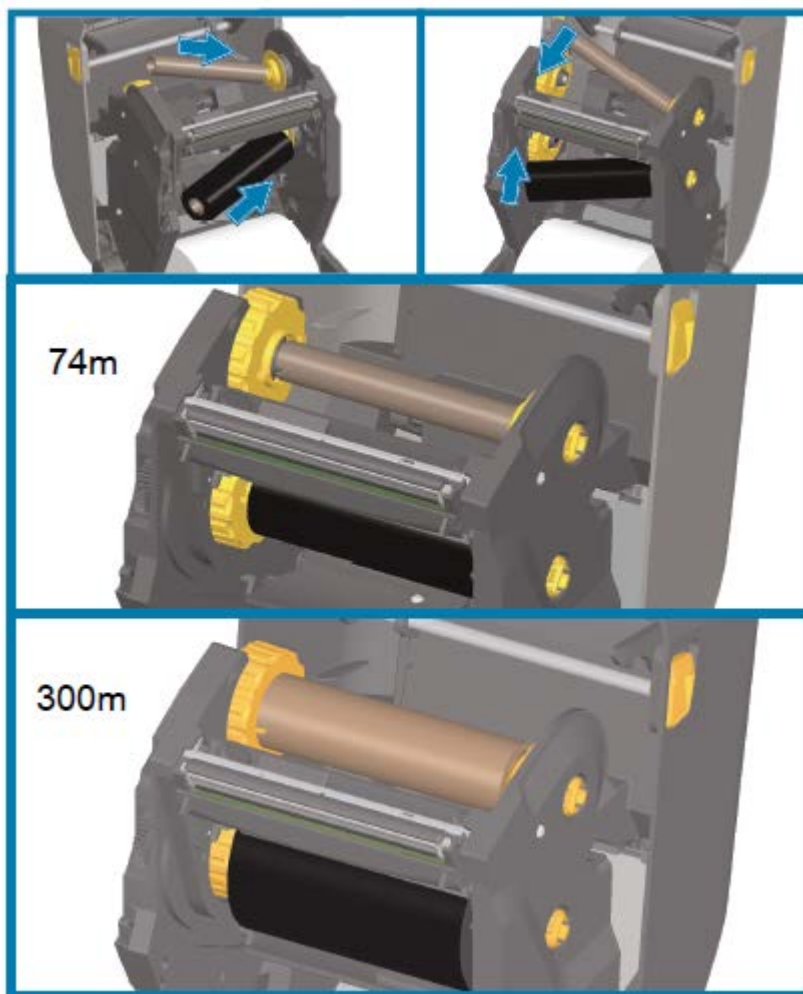
a	Notch (required on left side of ribbon)
b	Adhesive strip
c	Notches are also on the right side of the 74-meter ribbon
d	Right side (printer and roll)

1. With the printer open, place an empty ribbon core on printer's take-up spindles. Push the right side of the empty core onto the spring loaded spindle (right side). Align the core with the center of the left side spindle's hub and rotate the core until the notches align and lock.

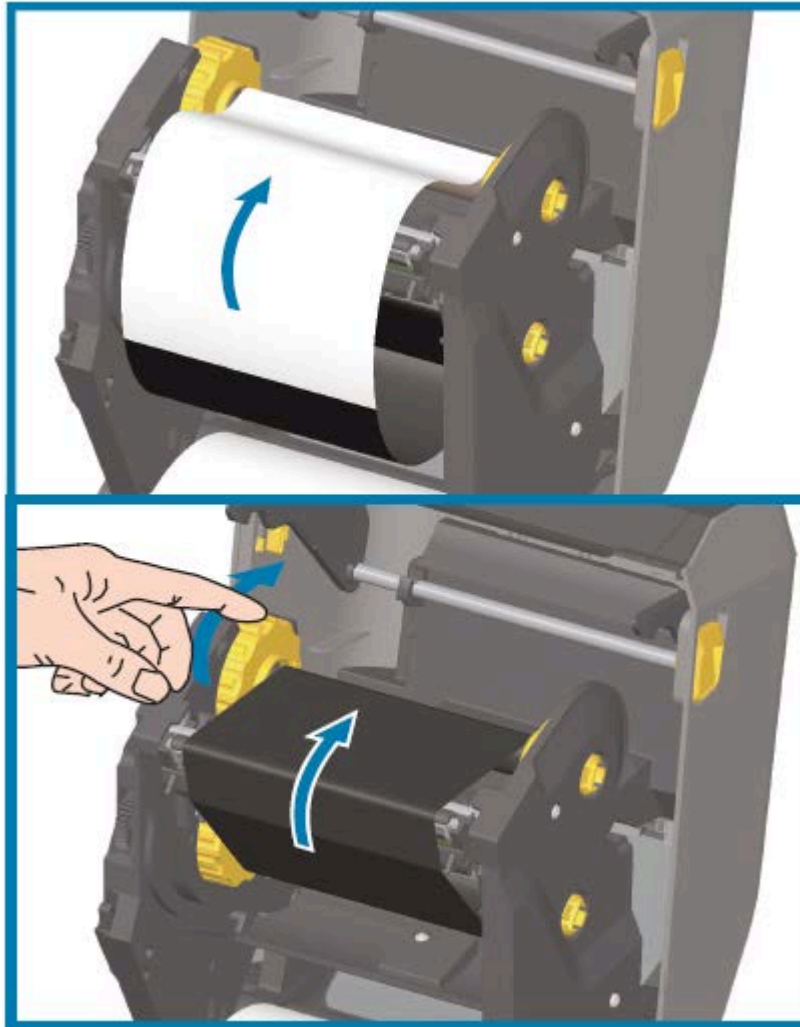


NOTE: You can find your first ribbon take-up core in the packing box. Subsequently, use the empty supply core from the supply spindle for the next roll of ribbon.

2. Place a new ribbon roll on printer's lower ribbon supply spindle. Push it onto the right spindle and lock the left side the same as the take-up mounting the take-up core.



3. Attach the ribbon to the take-up core. Use the adhesive strip on new rolls; otherwise, use a thin strip of tape. Align the ribbon so that it will be taken straight onto the core.



4. Turn the ribbon take-up hub with the top moving toward rear to remove slack from the ribbon. Rotating the hub helps to finish aligning the take-up ribbon position to the supply ribbon roll. The ribbon leader should be completely covered by the ribbon.
5. Verify that the media is loaded and ready to print and then close the printer cover.
6. If printer power is ON, press **FEED** to advance the media a minimum of 20 cm (8 in.) to straighten the ribbon and remove any slack and ribbon wrinkle and align the ribbon on the spindles. (Otherwise, wait to power the printer ON until you are instructed to do so during the setup process by the Installation Wizard.)
7. Use the printer driver, application software, or printer programming commands to change the print mode setting from DIRECT THERMAL to THERMAL TRANSFER.

When controlling printer operations with ZPL programming...

Refer to the Media Type ZPL II command (^MT and, follow the instructions, in the ZPL Programming Guide).

When controlling printer operations with EPL Page Mode...	Refer to the Options EPL command (0), and follow the instructions, in the EPL Page Mode Programmer's Guide).
---	--

This sets the printer's temperature profiles for thermal transfer media.

8. To verify the mode change from Direct Thermal printing to Thermal Transfer printing, print a configuration label (see [Test Printing with the Configuration Report](#) on page 131).

The PRINT METHOD shown on the printer configuration report should read THERMAL - TRANS.

Your printer is now ready to print.

Loading Non-Zebra 300-Meter Transfer Ribbon

To load non-Zebra 300-meter transfer ribbon onto your printer, you will need Zebra ribbon core adapters.

The minimum requirements to use non-Zebra 300-meter ribbons with your printer are:

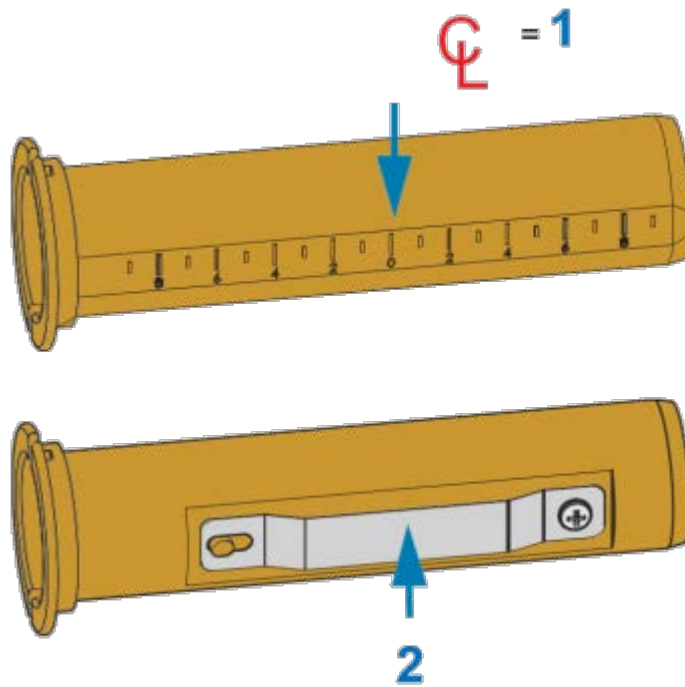
Inside core diameter (I.D.)	25.4 mm (1.0 in., with a range of 1.004 to 1.016 in.)
Inside core material	Fiberboard (hard materials such as plastic cores may NOT function correctly)
Ribbon width range	33 mm to 110 mm (1.3 to 4.3 in.)
Ribbon's maximum outer diameter (O.D.)	66 mm (2.6 in.)



CAUTION—PRODUCT DAMAGE: Using non-Zebra media or ribbons not approved for use in your Zebra printer may damage your printer or printhead. Image quality may also be affected by:

- poor or marginal ribbon performance (maximum print speed, ink formulation, etc.)
- core material that is too soft or too hard)
- loose or tight ribbon core fit or a ribbon core that exceeds the maximum outer diameter of 66 mm)

The adapters help you align the ribbon and core to the media (and printer's) center. They include a core-lock spring to engage the soft fiberboard inside the ribbon core and scale (measured from the printer's center-line) when mounted in the printer.



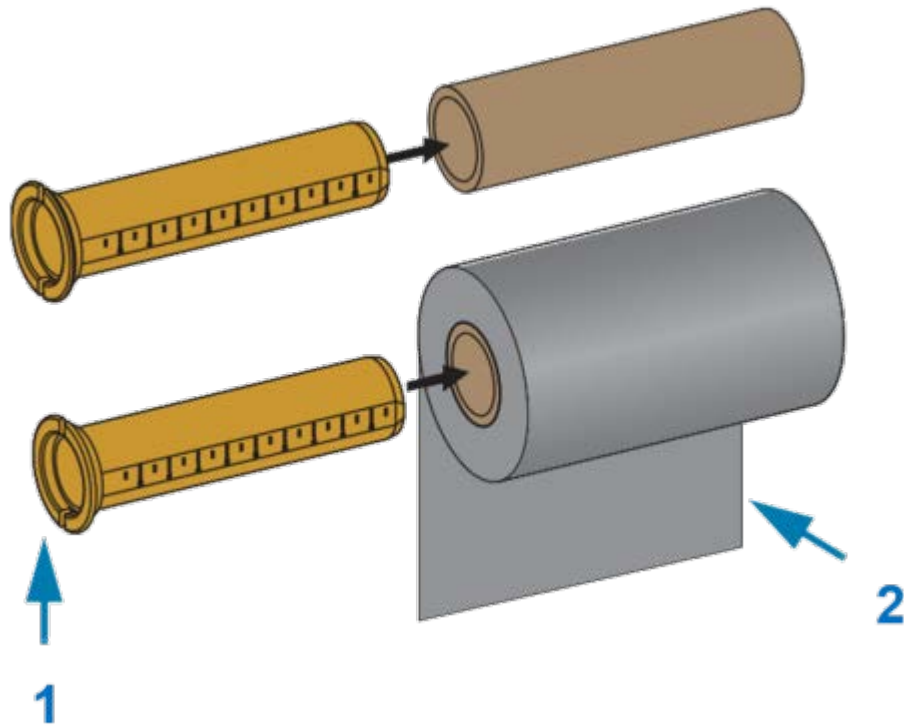
1	Center line
2	Core lock spring

1. Load an empty ribbon core onto a ribbon core adapter. The empty ribbon core should be the same width (or larger) than the ribbon roll. Roughly center the core over the adapters center line.



NOTE: An empty Zebra ribbon core may be used instead of the adapter and empty non-Zebra ribbon core. One 300-meter empty ribbon core is supplied with your printer.

2. Load the non-Zebra ribbon roll onto the ribbon-core adapter. Orient the adapter flange on the left side and verify that the ribbon unwraps on the backside of the roll as shown here. Roughly center the core over the center line (CL) of the adapter.



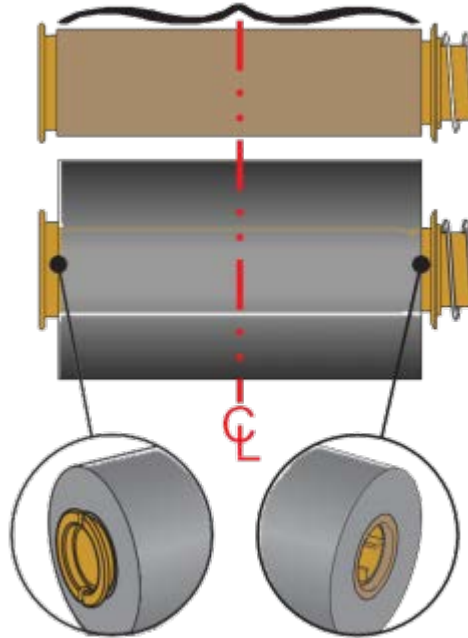
1	Flange – place on left
2	Ribbon exiting the roll in the back

**NOTE:**

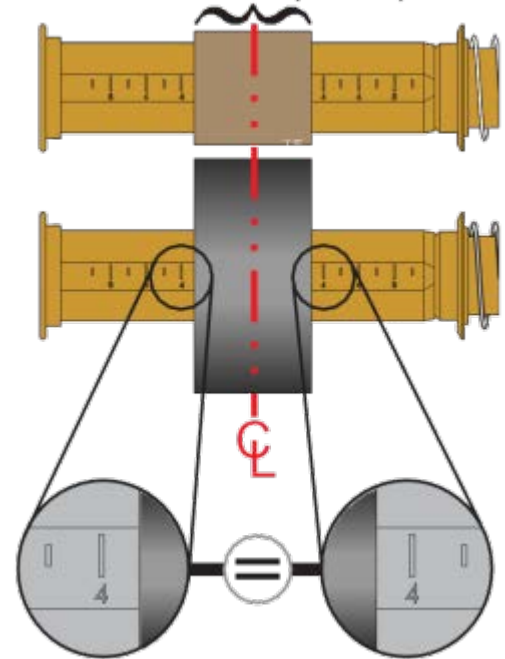
The maximum roll width of 110 mm (4.3 in.) does NOT require centering.

For media less than maximum width down to the minimum width of 33 mm (1.3 in.), use the graduated scale on the adapter core to align the ribbon rolls to the media and printer.

Width = 110 mm (4.3 in.)



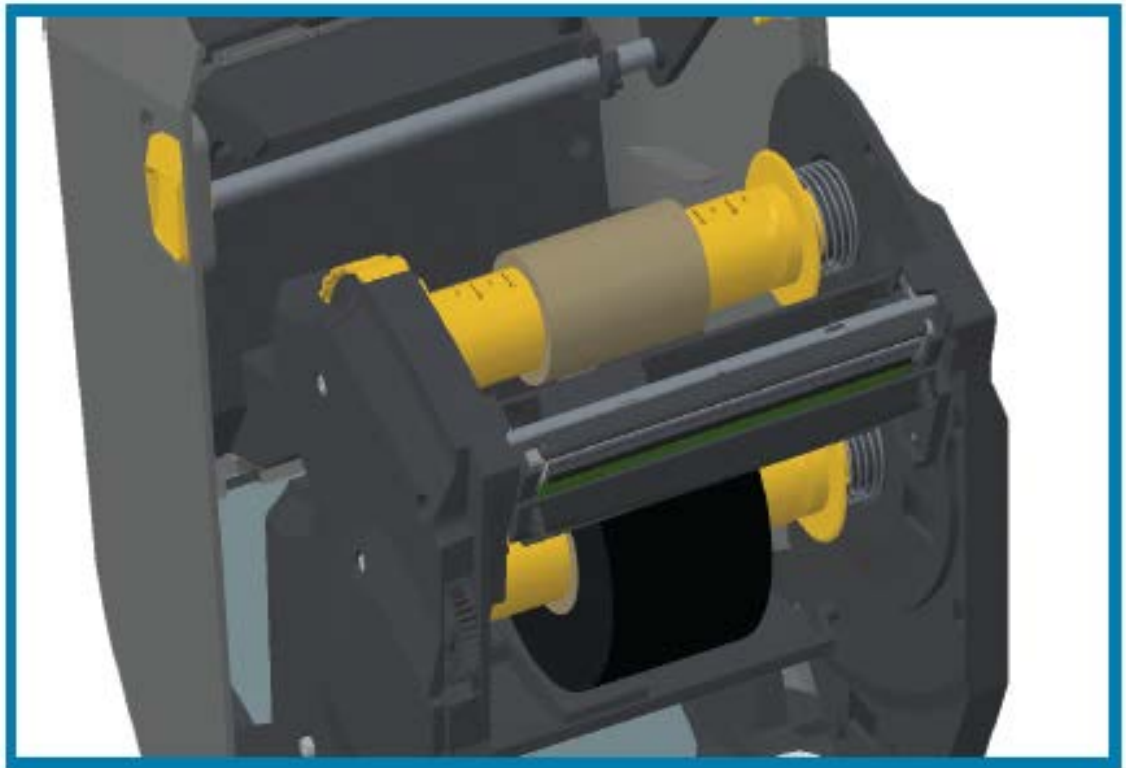
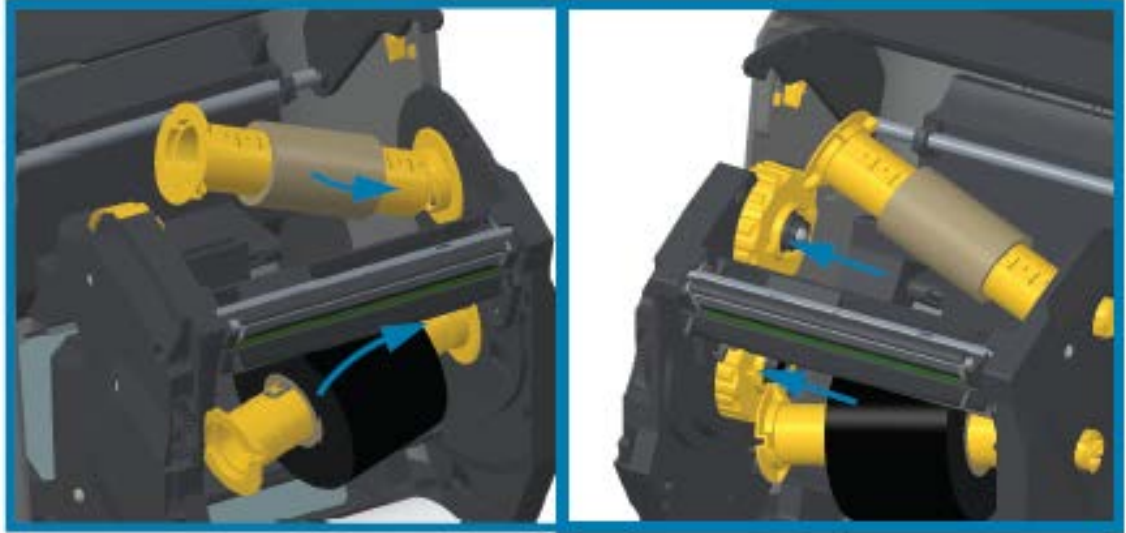
Width = 33 mm (1.3 in.)



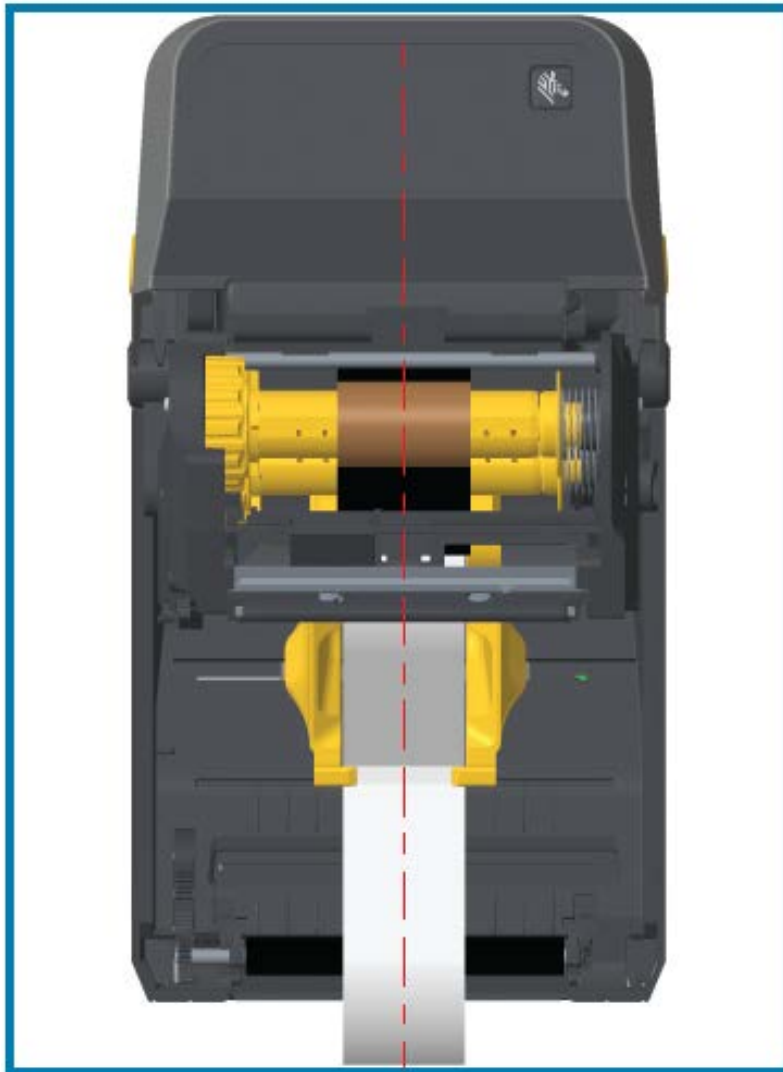
3. Place the adapter with an empty core on the take-up spindles and the adapter with the ribbon roll on the lower supply spindles. The right side of the core adapter fits on the cone-tip on each of the spring-loaded right-side spindles. Continue pushing the adapter onto right-side spindle and swing

Setup

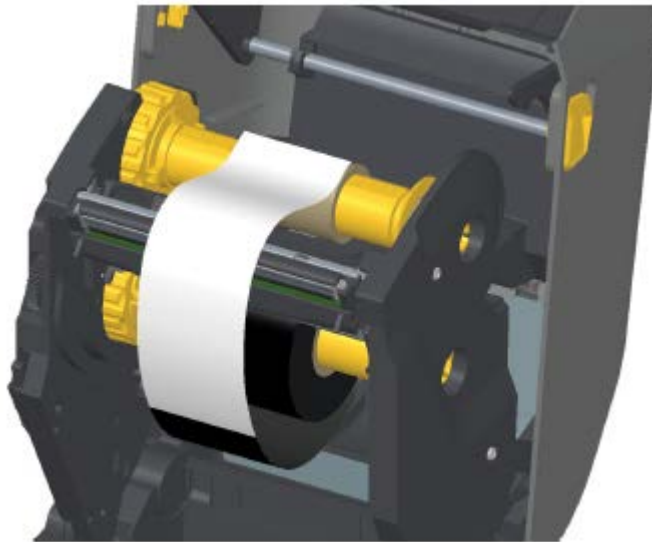
the adapter onto the left-side spindle hubs. Rotate the adapters and hubs until the notches on the adapters flange align and lock on the left spindles' hub spokes.



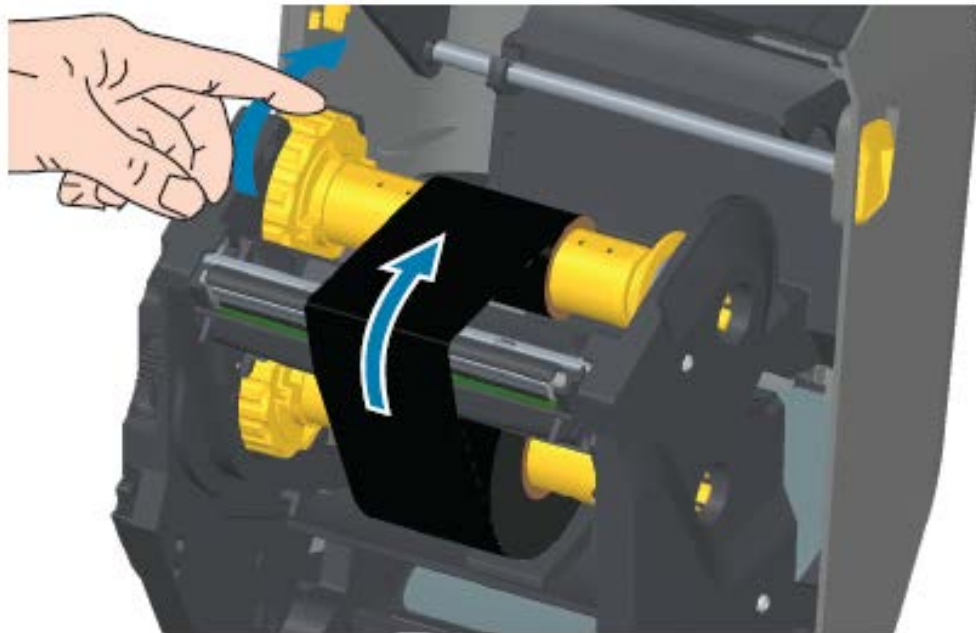
4. While the ribbon and empty cores were being installed during the previous steps, they may have been bumped off center.
 - Verify that the ribbon roll and empty core are aligned to the center of the media (labels, paper, tags, etc.). Use the center line scales on the ribbon core adapter as a guide to return them to the proper positions.
 - If you have not yet checked if the ribbon is wide enough for the media in use, now is the time to do so. To protect the printhead, the ribbon must be wider than the media (where the width includes the label liner or backing).



5. Attach the ribbon to the take up core. If your media does not have an adhesive strip on the ribbon leader as Zebra-manufactured ribbon does, use a thin strip of tape to secure the ribbon to the take-up core. Align the ribbon so that it will be taken straight onto the core.



6. Turn the ribbon take-up hub with the top moving towards the rear to remove slack from the ribbon. Rotate the hub to finish aligning the take-up ribbon position with the supply-ribbon roll. The ribbon should be wound, at a minimum, one-and-a-half times around the take-up ribbon core.



7. Verify that the media is loaded and ready to print, then close the printer cover.
8. If printer power is ON, press **FEED** to advance a minimum of 20 cm (8 in.) of media to remove slack and ribbon wrinkle (straighten the ribbon), and align the ribbon on the spindles. Otherwise, wait to power the printer ON until you are instructed to do so during the setup process by the Installation Wizard.

9. Use the printer driver, application software, or printer programming commands to change the print mode setting from Direct Thermal printing to Thermal Transfer.

When controlling printer operations with ZPL programming...	Refer to the Media Type ZPL II command (^MT), and follow the instructions, in the ZPL Programming Guide).
When controlling printer operations with EPL Page Mode...	Refer to the Options EPL command (O), and follow the instructions, in the EPL Page Mode Programmer's Guide).

This sets the printer's temperature profiles for Thermal Transfer media.

10. To verify the mode change from Direct Thermal printing to Thermal Transfer printing, print a configuration label (see cross-ref).

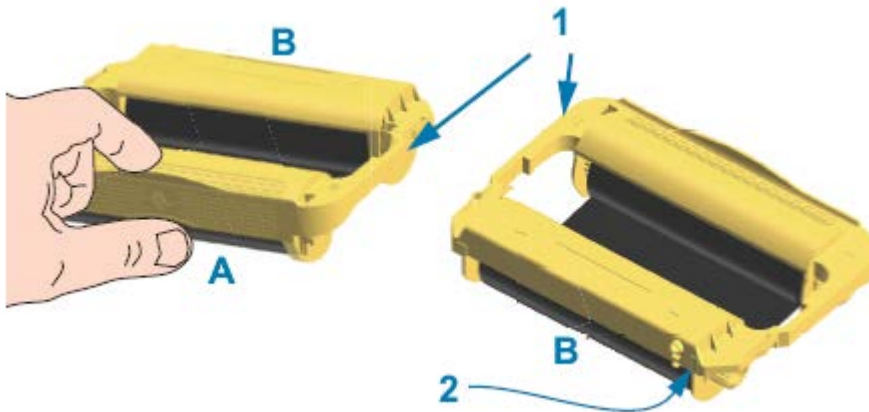
The PRINT METHOD on the printer configuration status report should read THERMAL - TRANS.

Your printer is now ready to print.

Loading the ZD420 Ribbon Cartridge

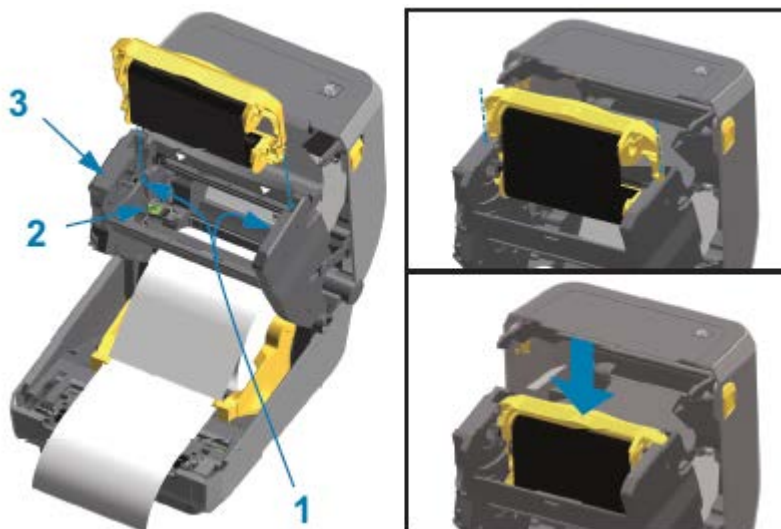
The printer uses a transfer ribbon cartridge for thermal transfer printing. Just slide the cartridge into the ribbon transport and close the printer. The printer reads cartridge information stored on the cartridge.

A	Hold the ribbon cartridge here.
B	Insert this end of the cartridge



1	Cartridge guide rails
2	Cartridge information smart chip

1. Insert the ribbon cartridge into the ribbon cartridge slot on the ribbon transport in your open printer.



1	Cartridge guides
2	Smart chip reader
3	Front of ribbon transport

2. Push until the cartridge is nearly flush to the front of the ribbon transport.

You will hear and feel the cartridge lock into place.



NOTE: Only Genuine Zebra Ribbon Cartridges are supported.

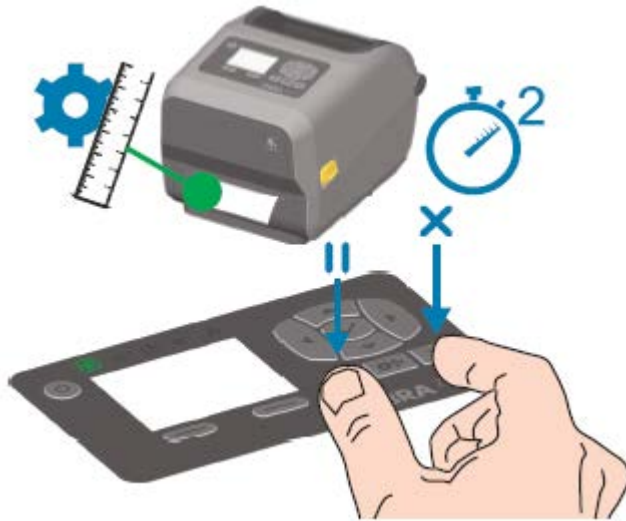
Running a SmartCal Media Calibration

The printer must set media parameters for optimal operation prior to printing. To do this, it automatically determines the media type (web/gap, black mark/notch, or continuous) and the measure media characteristics.

1. Make sure the media and ribbon (if you are thermal transfer printing) are loaded properly in the printer and the top cover of the printer is closed.
2. Press **POWER** to turn the printer on and wait until the printer is in the Ready state..

The STATUS Indicator lights up solid green

3. Press and hold **PAUSE** and **CANCEL** for two seconds, and release.



The printer measures a few labels and adjusts media sensing levels. When it has completed measuring, the STATUS indicator turns solid green.



NOTE: After initial calibration to a specific media is complete, additional calibrations are not necessary after you load a new batch as long as the newly-loaded media is of the same type as the prior media. The printer will automatically measure the new batch and adjust for any small changes in its characteristics when printing.

After you load a roll of new media from the same batch, simply press **FEED** (Advance) once or twice to synchronize the labels. This readies the printer to continue printing using the new batch of media without the need for recalibration.

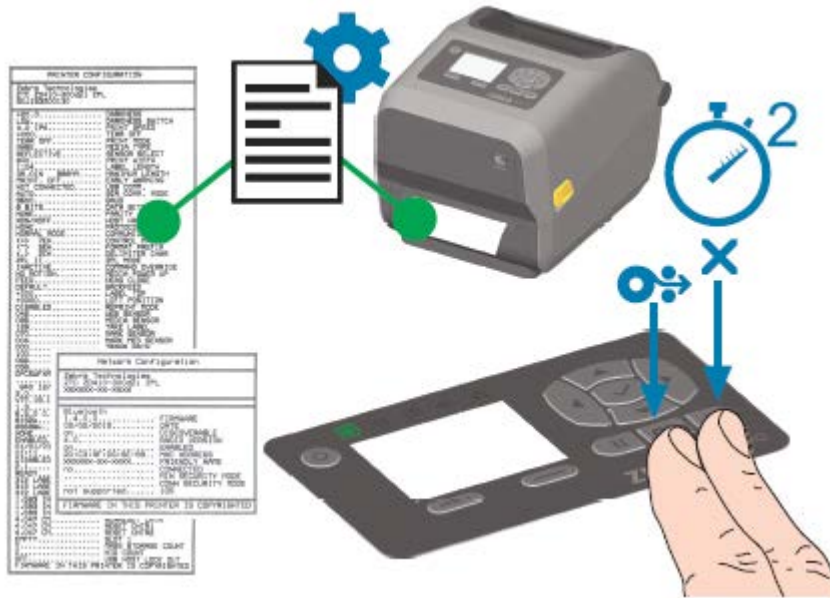
Test Printing with the Configuration Report

Before you connect the printer to a computer, make sure that the printer is in proper working order. You can do this by printing a configuration report.

The information in the Configuration Report may be help with printer installation and troubleshooting.

1. Make sure the media (and ribbon, if you printing on Thermal Transfer media) are loaded properly in the printer and the printer's top cover is closed.
2. Turn printer power ON.
3. After the printer enters ready state (the STATUS indicator lights solid green), press and hold **FEED** and **CANCEL** for two seconds and release.

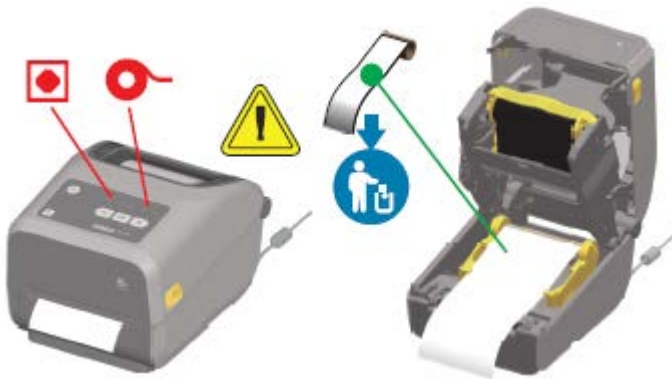
The Printer and Network Configuration Reports print. When the printer stops, the STATUS indicator turns solid green.



If you cannot get these reports to print, see [Troubleshooting](#) on page 232.

Detecting a Media-Out Condition

When you run out of media, your printer will report a Media Out condition with the STATUS Indicator flashing red. This is part of the normal media usage cycle.



Recovering from a Media-Out Condition

1. Open the printer.



NOTE: When you observe the media, it should be either at the end or nearly at the end of the roll, with a label missing from the liner.

2. Remove the remaining media and roll core.

3. Insert a new roll of media. (See [Loading Media](#) on page 111.) if your printer has the optional (factory-installed-only) cutter module.

If you are installing more of the same media...	Load the new media and press FEED (Advance) once to resume printing.
If you are loading different media (different size, vendor, or batch)...	Load the new media and calibrate the printer to the media to ensure optimal operation. (See cross ref.)



NOTE: Note that changing media size (length or width) usually requires you to change the programmed media dimensions or the active label format in the printer.



NOTE: If you load media of a different size (length or width), you will usually have to change the programmed media dimensions or the active label format in the printer.



IMPORTANT: Sometimes a label may be missing somewhere in the middle of your roll of labels (instead of at the end of the media roll). In addition to reaching the end of a roll, this will also cause a 'Media Out' condition. To recover from this condition:

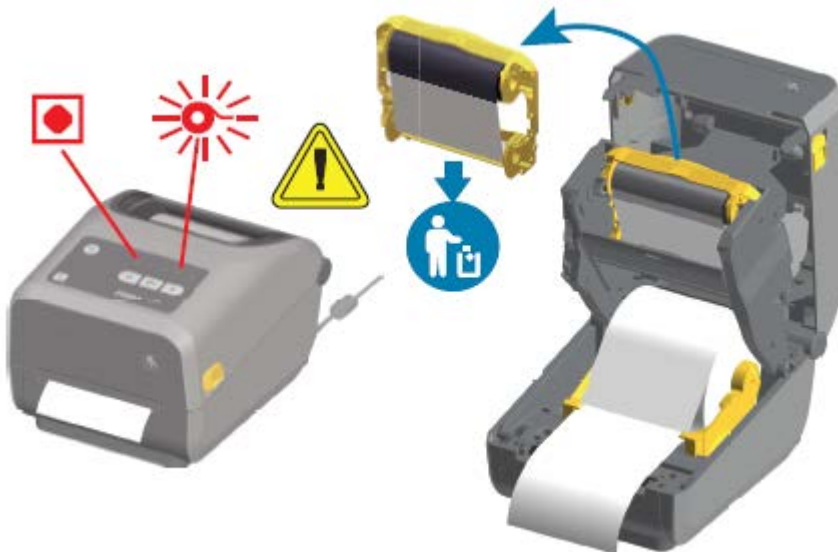
1. Pull the media past the missing label until the next label is over the platen roller.
2. Close the printer.
3. Press **FEED** (Advance) once.

The printer will resynchronize the label position and be ready to resume printing.

Detecting a Ribbon-Out Condition

The printer reports a media alert for a ribbon-out condition when it runs out of ribbon.

The printer auto-detects the silvery reflector on the end of Zebra-brand roll of ribbon and displays a media alert (the STATUS indicator flashes red). This is part of the normal media usage cycle.



Recovering from a Ribbon-Out Condition

Follow these steps to recover from a ribbon-out condition.

1. Open the printer.



NOTE: Observe that the reflective ribbon (used to detect end of ribbon) is exposed on the underside of the ribbon cartridge or ribbon roll. The front ribbon/top roll is also full.

2. Remove the used ribbon roll or ribbon cartridge from the take-up spindles and dispose of it.
3. Load new ribbon rolls or Insert a new ribbon cartridge. See [Loading Zebra Transfer Roll Ribbon](#) on page 119 and [Loading the ZD420 Ribbon Cartridge](#) on page 129.
4. Press **FEED** (Advance) once to resume printing.

Connecting Your Printer to a Computer

Use these steps to connect your printer to a computer.

1. Decide how you will connect to the printer.

Your printer supports these interface options and configurations:

- Universal Serial Bus (USB 2.0) interface — Standard. See [Interface Cable Requirements](#) on page 135 and [Universal Serial Bus \(USB\) Interface](#) on page 260 for cable requirements.
- RS232 Serial — Standard on ZD620 printers, and field upgrade option on ZD420 printers. See [Serial Port Interface](#) on page 261.
- Ethernet / LAN — Standard on ZD620 printers, and field upgrade option on ZD420 printers. See [Interface Cable Requirements](#) on page 135 and [Ethernet \(LAN, RJ-45\)](#) on page 137 for cable requirements).
- Internal Wi-Fi (802.11ac) and Bluetooth Classic 4.1 (3.0 Compatible) — Factory-installed option. See [Wi-Fi and Bluetooth Classic Wireless Connectivity Option](#) on page 139.



NOTE: Zebra ZD Series printers equipped with the Wi-Fi connectivity option support Bluetooth Low Energy (low-speed connection). You can configure them using software running on an Android or iOS device.

Be sure to review the cabling and unique parameters for each physical printer communication interface. This will help you set up the printer with the correct settings. For detailed instructions on configuring network (Ethernet / Wi-Fi) and Bluetooth communication, see the Wired and Wireless Print Server User Guide and the Bluetooth Wireless Guide available from the product information links listed in [About this Guide](#) on page 11.

2. Switch printer power OFF.
3. Connect the printer to the computer or device you will use to manage the printer using your selected connection method (USB, Ethernet / LAN, Wi-Fi, or Bluetooth).

4. Run Zebra Setup Utilities (ZSU) from your central device. See [Running the Printer Installation Wizard](#) on page 150.

The central device may be a Windows PC or laptop running the operating systems listed in [Setup for Windows](#) on page 146, an Android device, or an Apple device. Supported printer connection options are Wired/Ethernet, USB, and Wireless, Bluetooth Classic, and Bluetooth Low Energy (Bluetooth LE).

Zebra Setup Utilities (ZSU) are designed to assist you with installing these interfaces. (For ZSU user guides, go to zebra.com/setup.)



IMPORTANT: Wait to turn printer power ON until you are instructed to do so by the Installation Wizard. Keep the power switch in the OFF position when attaching the interface cable. The power cord must be inserted into the power supply and the power receptacle on the back of the printer **BEFORE** you connect or disconnect the communications cables.

The ZSU wizard installs the Zebra Windows drivers.

5. When the ZSU installation wizard prompts you to do so, turn printer power ON, then follow the on-screen instructions to complete the printer setup.

Interface Cable Requirements

Data cables must be of fully-shielded construction 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 (1.83 m [6 ft.] recommended).
- Do NOT tightly bundle the data cables with power cords.
- Do NOT tie the data cables to power wire conduits.



IMPORTANT: This printer complies with FCC Rules and Regulations, Part 15, for Class B Equipment, using fully-shielded data cables. Use of un-shielded cables may increase radiated emissions above the Class B limits.

USB Interface

Universal Serial Bus (version 2.0 compliant) provides a fast interface that is compatible with your existing PC hardware. USB's plug-and-play design simplifies the installation. Multiple printers can share a single USB port/hub.

When using a USB cable, verify that the cable or cable packaging bears the "Certified USB™" mark (see below) to guarantee USB 2.0 compliance.



Serial Interface

The printer uses a Null Modem (cross-over) cable for DTE communications. The required cable must have a nine-pin D-type (DB-9P) male connector on one end which plugs into the mating (DB-9S) serial port located on the back of the printer. The other end of this signal interface cable connects to a serial port on the host computer.

For pin-out information, see [Serial Port Interface](#) on page 261.

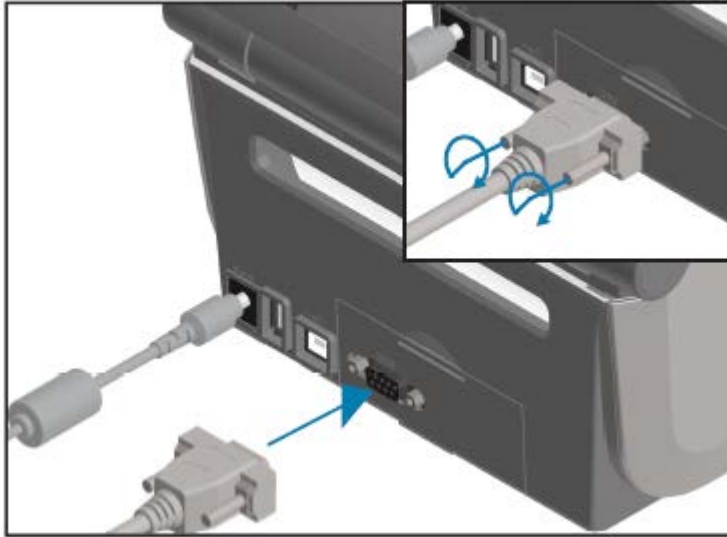
The serial port communication settings between the printer and host (typically a PC) must match for reliable communication. The Bits per second (or Baud rate) and Flow control are the most common settings that get changed.

Serial communications between the printer and the host computer can be set by:

- ZPL ^SC command.
- resetting the printer to its default printer configuration.

Factory defaults for serial communication settings are:

- 9600 baud
- 8 bit word length
- NO parity
- 1 stop bit
- XON/XOFF
- 'Software' data flow control in Windows-based host systems



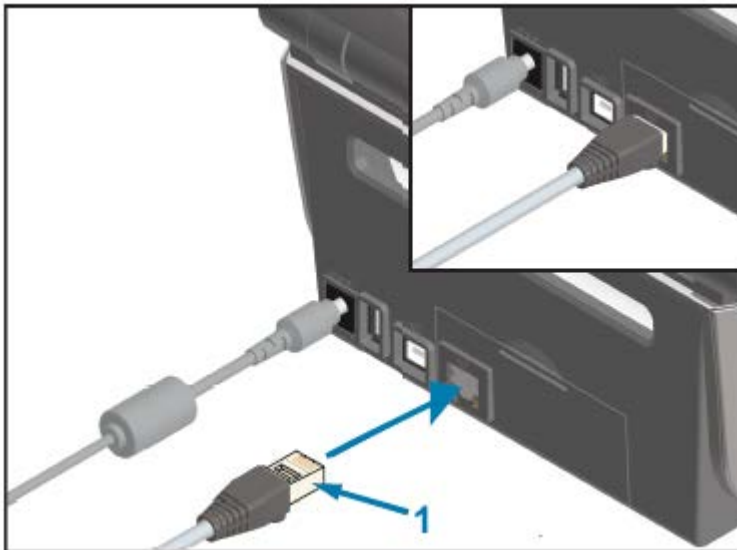
IMPORTANT: Do not use RS-232 cable adapter dongles (DTE<=>DCE) with this printer. Some dongles can interfere with the operation of USB host port devices at printer power-up.

Ethernet (LAN, RJ-45)

Your printer requires UTP RJ-45 Ethernet cable rated CAT-5 or better.

Your printer must be physically connected to your Ethernet / LAN network using the appropriate cable and be configured properly to make a network connection and operate on your network.

The printer includes an in-built network print server which can be accessed through the printer's print server web pages.



1

Ethernet cable (RJ-45 connector)



NOTE: For information on how to configure your printer to run on a compatible Ethernet / LAN, see the Wired and Wireless Print Server User Guide.

Ethernet Status / Activity Indicators

The Ethernet connector on the printer has two status / activity indicators. These indicators are partially visible to provide interface status at the connector.

In addition, the printer has user interface indicator lights that display printer network operation status. See [Meaning of the Indicator Light Patterns](#) on page 60 for details.

LED Status	Description
Both OFF	No Ethernet link detected.
Green	100 Mbps link detected.
Green with the Amber flashing	100 Mbps link and Ethernet activity detected.
Amber	10 Mbps link detected.
Amber with the Green flashing	10 Mbps link and Ethernet activity detected.

Assigning an IP Address for Network Access

All devices on an Ethernet network (LAN and WLAN) including your printer require a network IP (Internet Protocol) address.

You will need the printer's IP address to access the device for printer configuration and for printing.

There are five ways to assign an IP address:

- DHCP (Dynamic Host Configuration Protocol) (default setting)
- Zebra Setup Utilities (includes the ZebraDesigner Windows printer driver)
- Telnet
- Mobile Apps
- ZebraNet Bridge.

DHCP for Personal Networks

Your printer is set to operate on an Ethernet LAN or Wi-Fi network with DHCP by default.

This setting is intended primarily for personal networks. The network automatically provides a new network IP address each time printer power is turned ON.

The Windows printer driver uses a Static IP address to connect to the printer. You must change the IP address set in the printer driver to access the printer if its assigned IP address has changed after initial printer installation.

Using Your Printer on a Managed Network

Using the printer in a structured network (LAN or Wi-Fi) requires a network administrator to assign the printer a Static IP address and establish other settings that your printer needs to operate on the network.

Print Server User ID and Password Defaults

You will need the default User ID and/or default password for the printer's in-built print server to access some printer's features and its WiFi option.

Factory default User ID: admin

Factory default Password: 1234

Wi-Fi and Bluetooth Classic Wireless Connectivity Option

This user guide covers only basic configuration of your Internal Wi-Fi Print Server and Bluetooth Classic 4.X wireless connectivity options as described in [Setting Up the Wi-Fi Print Server Option](#) on page 153 and [Configuring the Printer Using Bluetooth](#) on page 163.

For details on your printer's Ethernet and Bluetooth operations, see the Wired/Wireless Print Server User Guide and the Bluetooth Printer Management Guide available from zebra.com.

Update Printer Firmware to Finish Option Installations

It is recommended that you always update the printer's firmware with the latest version for optimal printer performance.

For instructions on how to update printer firmware, see [Updating Printer Firmware](#) on page 230. See [About this Guide](#) on page 11 for links to printer support pages for your specific Link-OS printer model and firmware updates for your printer model(s).

What To Do If You Forget to Install the Printer Drivers First

If you plug your Zebra printer into a power source and printer power is turned ON before installing the drivers, the printer displays as an Unspecified device on your host computer. Use this procedure to make sure the printer is identifiable by name on your host device.

1. From the **Windows** menu, open the **Control Panel**.
2. Click **Devices and Printers**.

In this example, the ZTC ZT320-203dpi ZPL is an incorrectly installed Zebra printer.

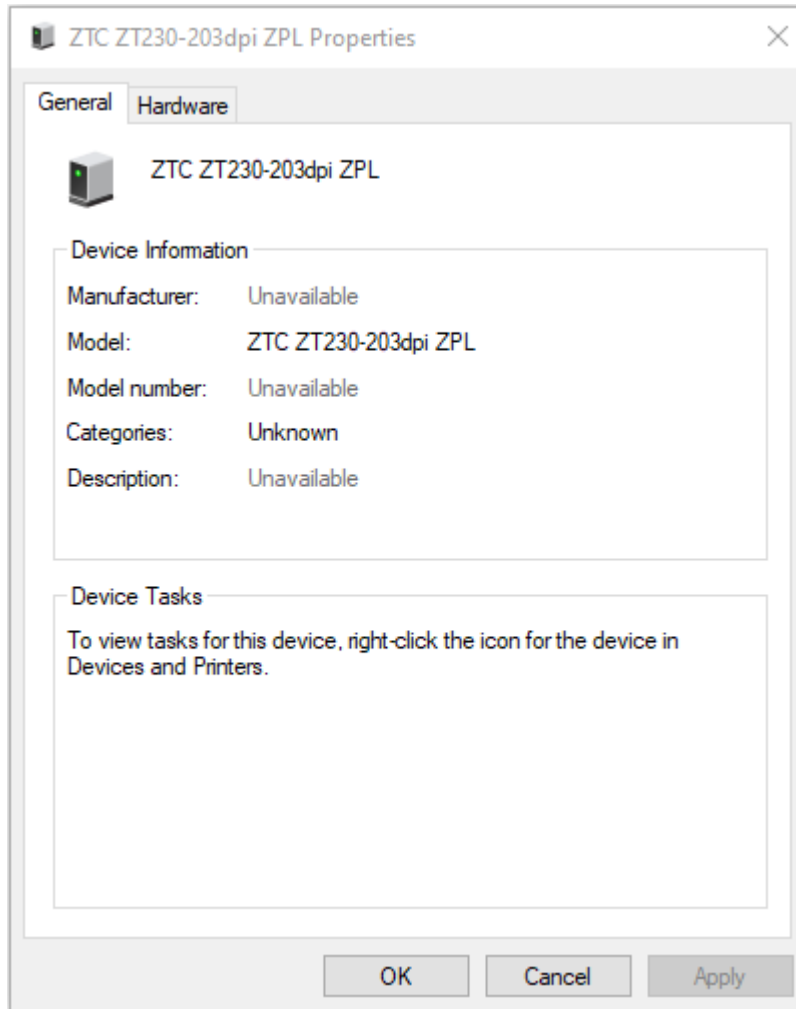
▼ **Unspecified (1)**



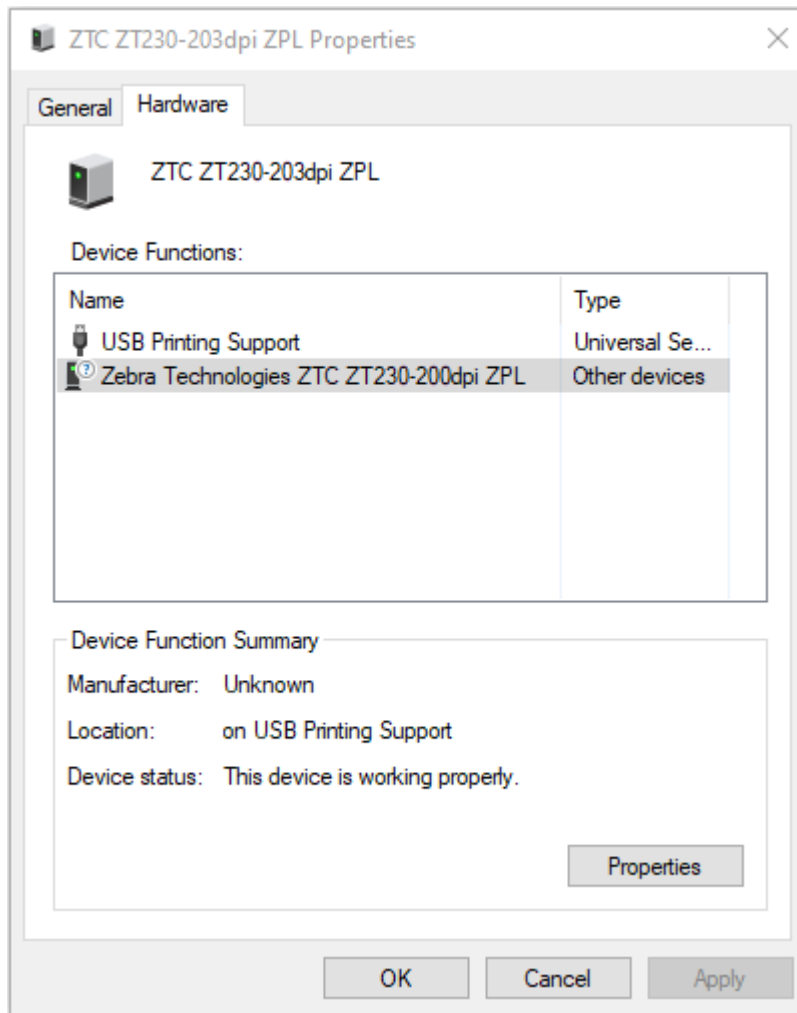
ZTC
ZT320-203dpi
ZPL

3. Right-click on the icon representing the device, then select **Properties**.

The properties for the device display.

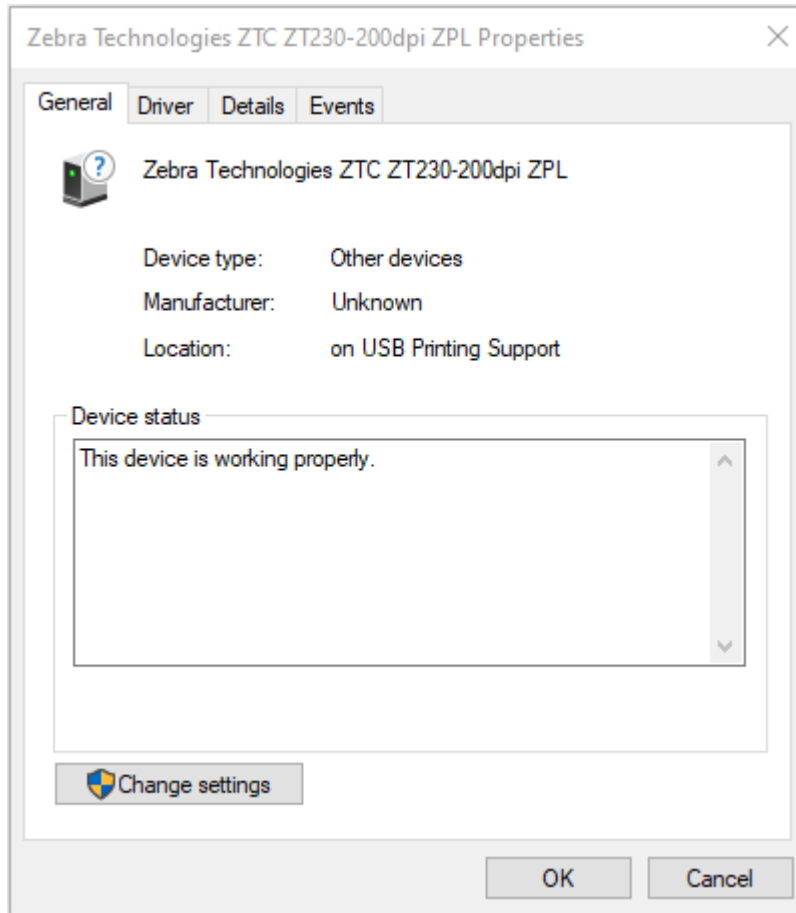


4. Click the **Hardware** tab.

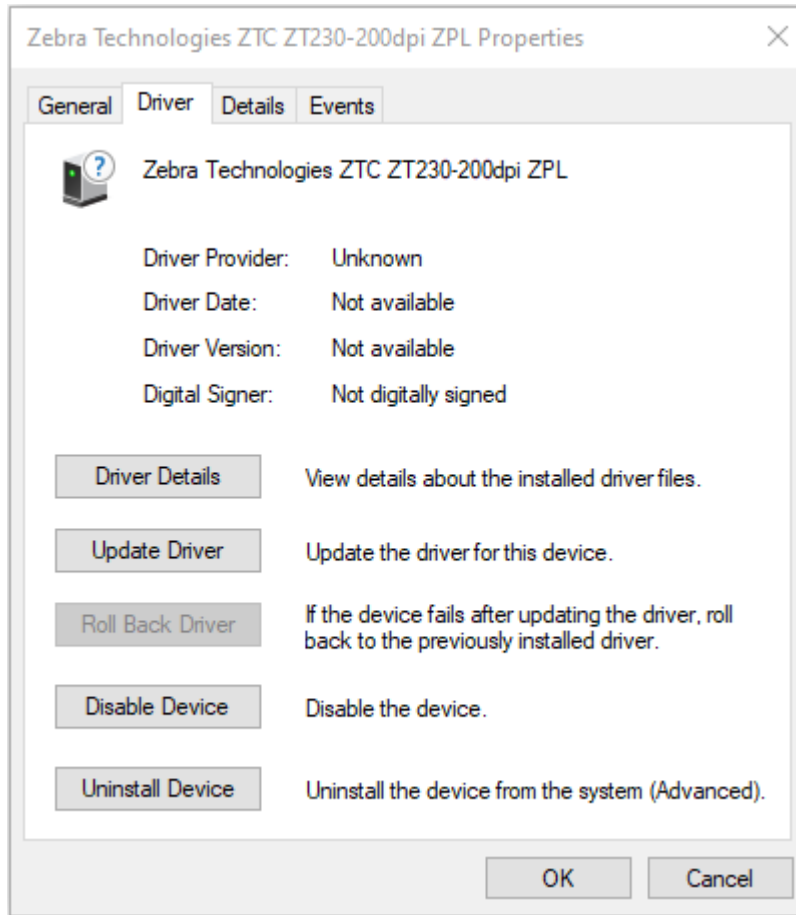


5. Select the printer in the **Device Functions** list, and then click **Properties**.

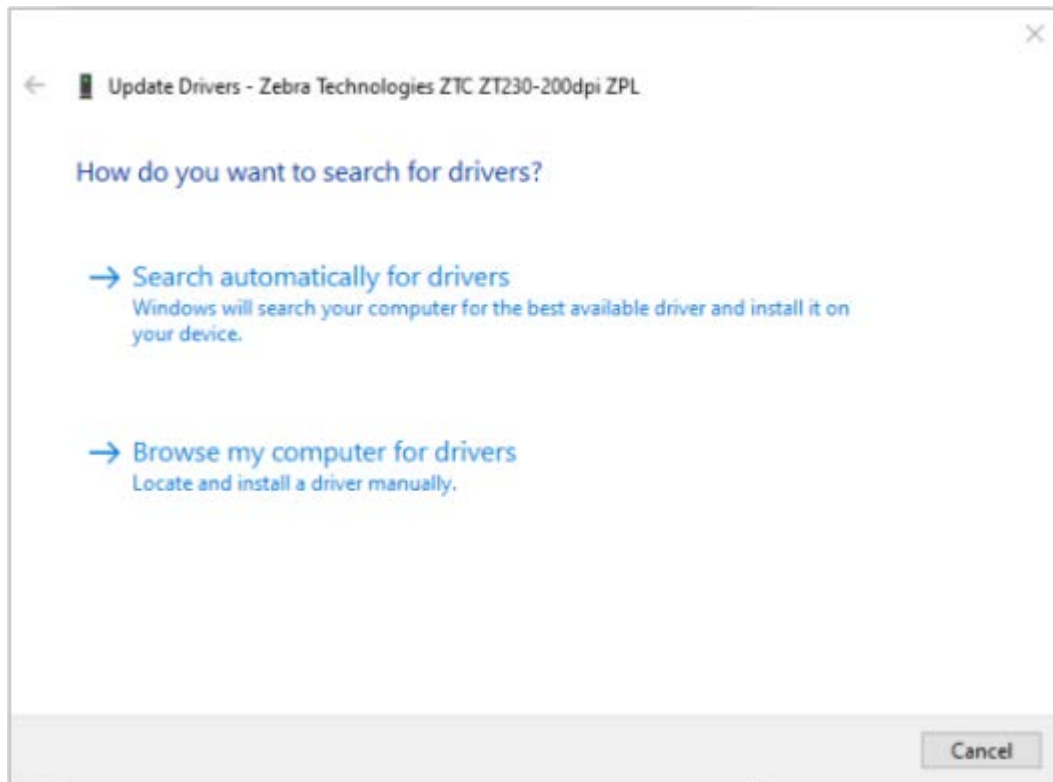
The properties display.



6. Click **Change settings** and then click the **Driver** tab.

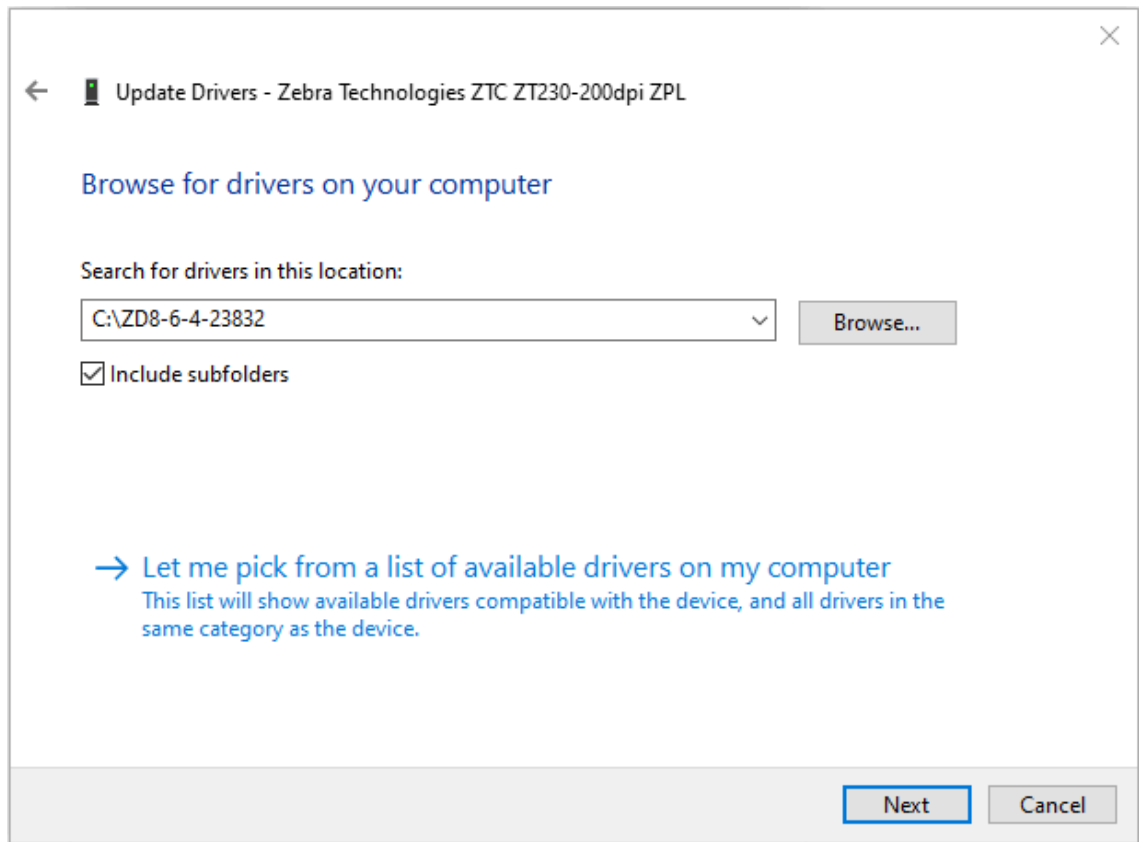


7. Click **Update Driver**.



8. Click **Browse my computer for driver software**.
9. Click **Browse...** and navigate to the **Downloads** folder.

10. Click **OK** to select the folder.



11. Click **Next**.

The device is updated with the correct drivers.

Setup for Windows

The section helps you setup communications between your printer and the Windows operating system environment.

Windows-to-Printer Communication Setup (Process Overview)

Use this overview to understand how to set up your printer using the most common (supported) Windows operating systems and a local (wired) connection.

You may also set up your printer using factory-installed Wi-Fi or Bluetooth as described in [Setting Up the Wi-Fi Print Server Option](#) on page 153 and [Configuring the Printer Using Bluetooth](#) on page 163.

1. Download the Zebra Setup Utilities (ZSU) from one of the printer information pages listed in [About this Guide](#) on page 11.
2. Make sure printer power is OFF.
3. Run Zebra Setup Utilities (ZSU) from your Download directory.
4. Click **Install New Printer** and run the installation wizard.
5. Click **Install Printer**, then select your printer's model number from the list of Zebra printers.
6. Select the appropriate USB port and connect to the PC.

You can use the USB interface for a wizard-guided installation of networked devices or Bluetooth Classic (4.0) devices.
7. When the installation wizard instructs you to do so, turn printer power ON.
8. Use the wizard to configure printer communications for the selected interface type.
9. Perform a print test to verify that your printer has been set up properly. See [Test Printing with the Configuration Report](#) on page 131.



IMPORTANT: If you did not install the printer drivers before connecting to the printer when it was powered ON, see [What To Do If You Forget to Install the Printer Drivers First](#) on page 139.

Installing the Windows Printer Drivers

To use your printer with a Microsoft Windows-based computer, you must install the correct drivers first. Use the Zebra Setup Utilities to install the printer drivers on your central device and run the Utilities with power to the printer is switched OFF. These drivers enable you to set up and manage your printer from the convenience of your central device: a Windows PC, an Android device, or an Apple device.



NOTE: You may connect your printer to your computer using any of the supported connections that are available to you to use. However, do NOT connect any cables from your computer to the printer UNTIL you are instructed to do so by the installation wizards. If you connect the cables at the wrong time, your printer will not install the correct printer drivers. To recover from incorrect driver installation, see [What To Do If You Forget to Install the Printer Drivers First](#) on page 139.



NOTE: If using a PC, it must run a Zebra-driver-supported Windows OS. (See the Zebra Setup Utilities Release Notes for a list of supported Windows operating systems.)

If you are using a physical cable to connect your computer to the printer, be sure to review the cabling specifications and the parameters specific to the physical communication interface you plan to use. This information will help you make the appropriate configuration setup choices both prior to and immediately after you apply power to the printer.

- For basic interface cabling requirements, see [Interface Cable Requirements](#) on page 135.
- For USB cable requirements and information on basic USB connectivity, see [USB Interface](#) on page 135.
- For Ethernet cable specifications and information on basic Ethernet connectivity, see [Ethernet \(LAN, RJ-45\)](#) on page 137.
- For detailed information on installing Ethernet/LAN and Bluetooth interfaces, see the Wired/Wireless Print Server User Guide and the Bluetooth Printer Management Guide available from zebra.com.

1. Navigate to zebra.com/drivers.
2. Click **Printers**.
3. Select your printer model.
4. On the product page for your printer, click **Drivers**.
5. Download the appropriate driver for Windows.

The driver executable file (such as `zd86423827-certified.exe`) is added to your Download folder.

6. Ensure printer power is OFF.



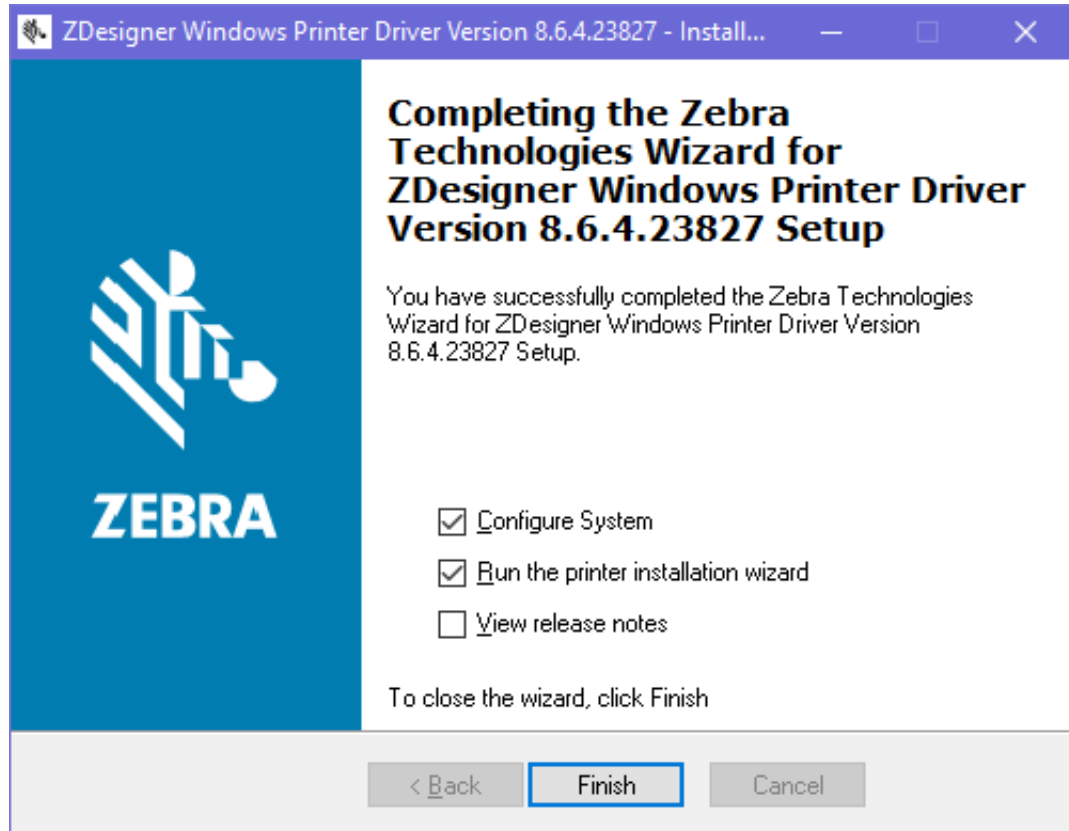
IMPORTANT: Do NOT turn printer power on until you are instructed to do so by the Setup Wizard.

7. From your PC, run the Zebra Setup Utilities (ZSU) executable and follow the prompts.

The setup wizard installs the printer drivers and prompts you to turn printer power ON.

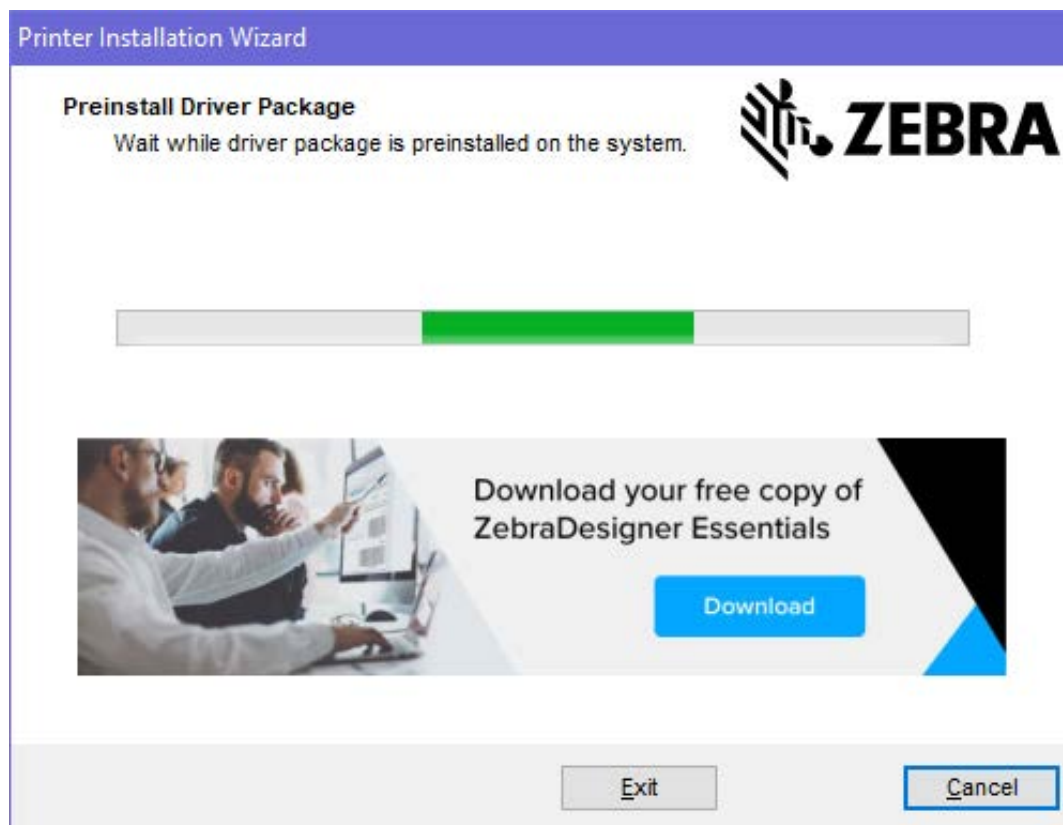


NOTE: When setup is complete, you may select to add the drivers to your system (Configure System) or elect to add specific printers in a later step.



8. Select **Configure System** and click **Finish**.

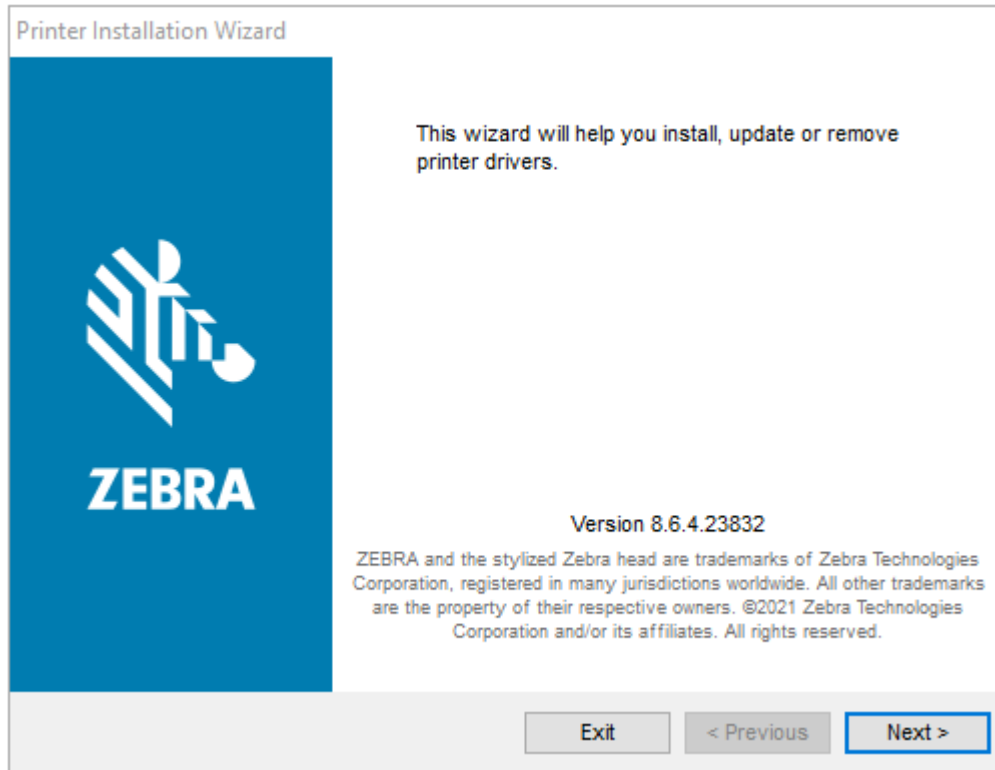
The Printer Installation Wizard installs the drivers.



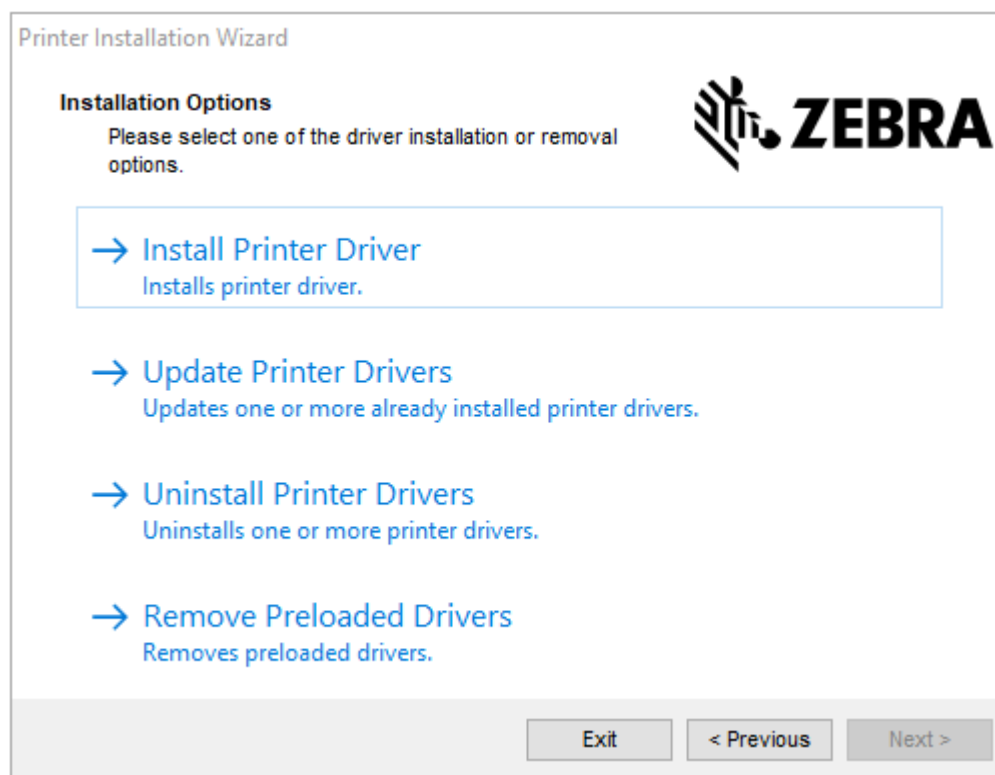
Running the Printer Installation Wizard

1. On the last screen of the driver installer, leave **Run the Printer Installation Wizard** checked, then click **Finish**.

The Printer Driver Wizard displays.



2. Click **Next**.



3. Click **Install Printer Driver**.

The license agreement displays.



The image shows a Windows-style dialog box titled "Printer Installation Wizard". Inside, the "License Agreement" section is active, with a sub-header "END USER LICENSE AGREEMENT (UNRESTRICTED SOFTWARE)". The main text of the agreement is displayed in a scrollable area. At the bottom, there are two radio buttons for accepting or declining the terms, and three buttons: "Exit", "< Previous", and "Next >". The Zebra logo is in the top right corner.

Printer Installation Wizard

License Agreement
Please read license agreement before installing printer driver.

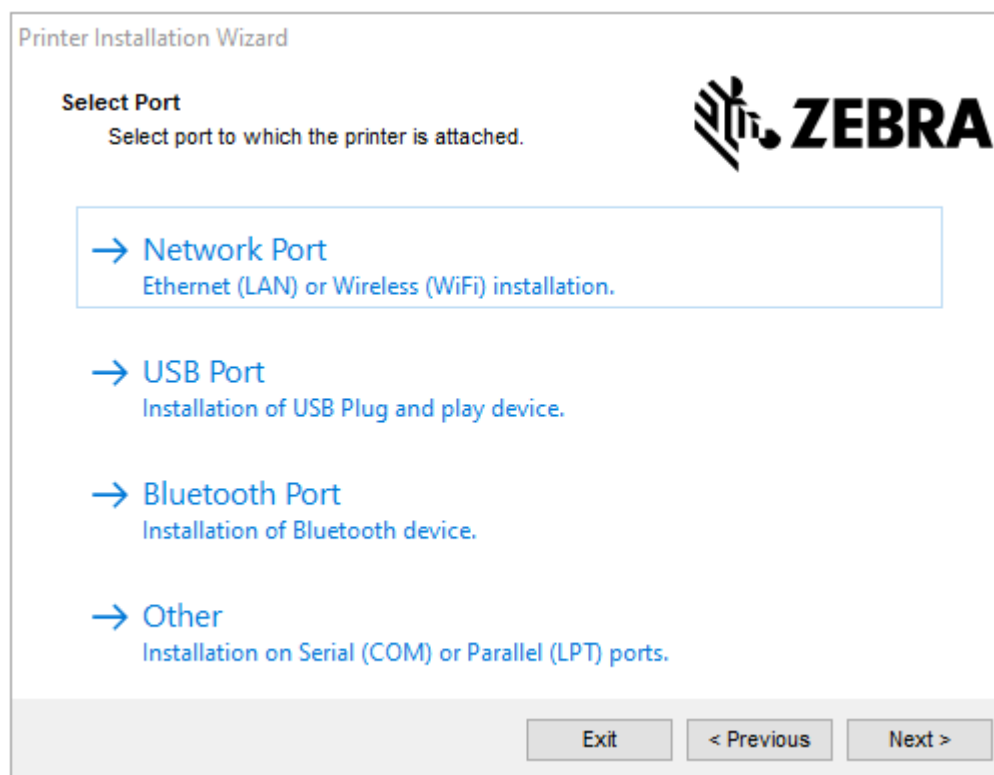
**END USER LICENSE AGREEMENT
(UNRESTRICTED SOFTWARE)**

IMPORTANT PLEASE READ CAREFULLY: This End User License Agreement ("EULA") is a legal agreement between you (either an individual or a company) ("Licensee") and Zebra Technologies Corporation ("Zebra") for Software, owned by Zebra and its affiliated companies and its third-party suppliers and licensors, that accompanies this EULA. For purposes of this EULA, "Software" shall mean machine-readable instructions used by a processor to perform specific operations. BY USING THE SOFTWARE, LICENSEE ACKNOWLEDGES ACCEPTANCE OF THE TERMS OF THIS EULA. IF LICENSEE DOES NOT ACCEPT THESE TERMS, LICENSEE MAY NOT USE THE SOFTWARE.

☐ I accept the terms in the license agreement
☒ I do not accept the terms in the license agreement

Exit < Previous Next >

4. Read and accept the terms of the license agreement, and then click **Next**.



5. Select the communication option that you want to configure for your printer:
- **Network Port:** To install printers with an Ethernet (LAN) or wireless (Wi-Fi) network connection. Wait for the driver to scan your local network for devices and follow the prompts.
 - **USB Port:** To install printers connected with the USB cable. Connect the printer to the computer. If the printer is already connected and powered on, you may need to remove the USB cable and install it again. The driver will automatically search for the model of the connected printer.
 - **Bluetooth Port:** To install printers with a Bluetooth connection.
 - **Other:** For installation on another type of cable, such as Serial (COM). No additional configuration is necessary.
6. If prompted, select your printer model and resolution.

The model and resolution are listed on the printer configuration label. See [Test Printing with the Configuration Report](#) on page 131 for instructions on printing a label.

Setting Up the Wi-Fi Print Server Option

The wireless radio option (which includes Wi-Fi, Bluetooth Classic and Bluetooth Low Energy) is available ONLY as a factory-installed configuration. These instructions guide you through basic configuration of your internal Wi-Fi Print Server option using the Connectivity Wizard.



NOTE: For detailed information on installing Ethernet/LAN and Bluetooth interfaces, see the Wired/Wireless Print Server User Guide and the Bluetooth Printer Management Guide available from zebra.com.

You may configure your printer for wireless operation using one of these methods:

Using the Connectivity Wizard (covered in this guide)	When run, the wizard writes a ZPL script to enable your PC to communicate with your printer over Wi-Fi. Towards the end of the process, the wizard will prompt you to either send the command directly to your printer, or save the ZPL script to a file. If you elect to save this ZPL file: - You can send the file to one or more printers that will use the same network settings, using any available connection (serial, parallel, USB, or wired print server). - You can resend the file to the printer at a future time if the printer's network settings were restored to their factory defaults.
Using a ZPL script that you write yourself*	Use the <code>^WX</code> command to set the basic parameters for Security Type.
Using Set/Get/Do (SGD) commands that you send to the printer	Begin with <code>wlan . security</code> to set the Wireless Security type. Then add other SGD commands (which will be necessary based on the security type you select) to specify the other required parameters.
 NOTE: * Refer to the ZPL Programming Guide for more information on these options. You can send these commands through any available connection (serial, parallel, USB, or wired print server).	

Configuring the Printer Using ZebraNet Bridge's Connectivity Wizard

While you have several options to connect to and configure your printer for cloud, WLAN and LAN operations, the recommended tool to use is Link-OS Profile Manager. Link-OS Profile Manager is provided with the ZebraNet Bridge Enterprise (for local and LAN configurations), a configuration utility that is available for download from zebra.com/software.

The Connectivity Wizard (which is part of this software) allows you to easily configure your printer for wireless operation by authoring the appropriate ZPL script for your printer. Use this utility to configure your printer's wireless print server either for the first time or after you reset the printer's network options to their factory defaults.

1. If it is not already downloaded and installed, download ZebraNet Bridge Enterprise version 1.2.5 or later from zebra.com/software and install it on your computer.



NOTE: You will need ZebraNet Bridge Enterprise version 1.2.5 or later to configure the printer.

2. Launch the ZebraNet Bridge Enterprise utility. If you are prompted for a serial number, you can choose to click **Cancel** and continue using the Connectivity Wizard.

3. From the Windows **Menu** bar, select **Tools > Connectivity Wizard**.

The Connectivity Wizard opens.

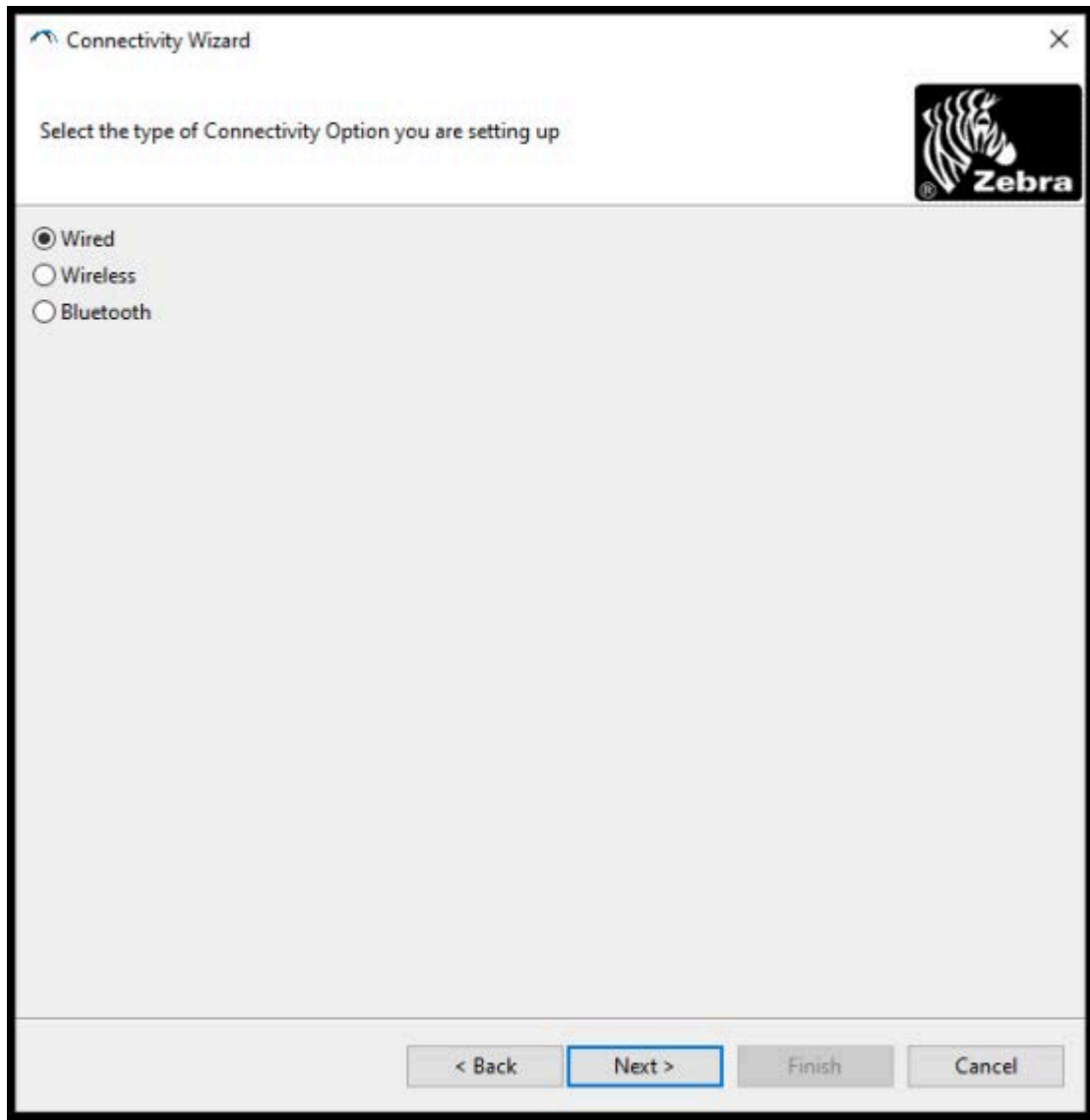


4. From the **Choose Port** list, select the port to which your printer is connected.

If you want to save the file without sending it to a printer...	Select any available port.
If you decide to select File...	Browse to the location of the file.
If you select a serial port...	Serial port configuration information appears below the Choose Port list. If necessary, change the serial communication settings to match your printer's settings.  NOTE: If a port is in use by another device, it will NOT appear in the drop-down list.

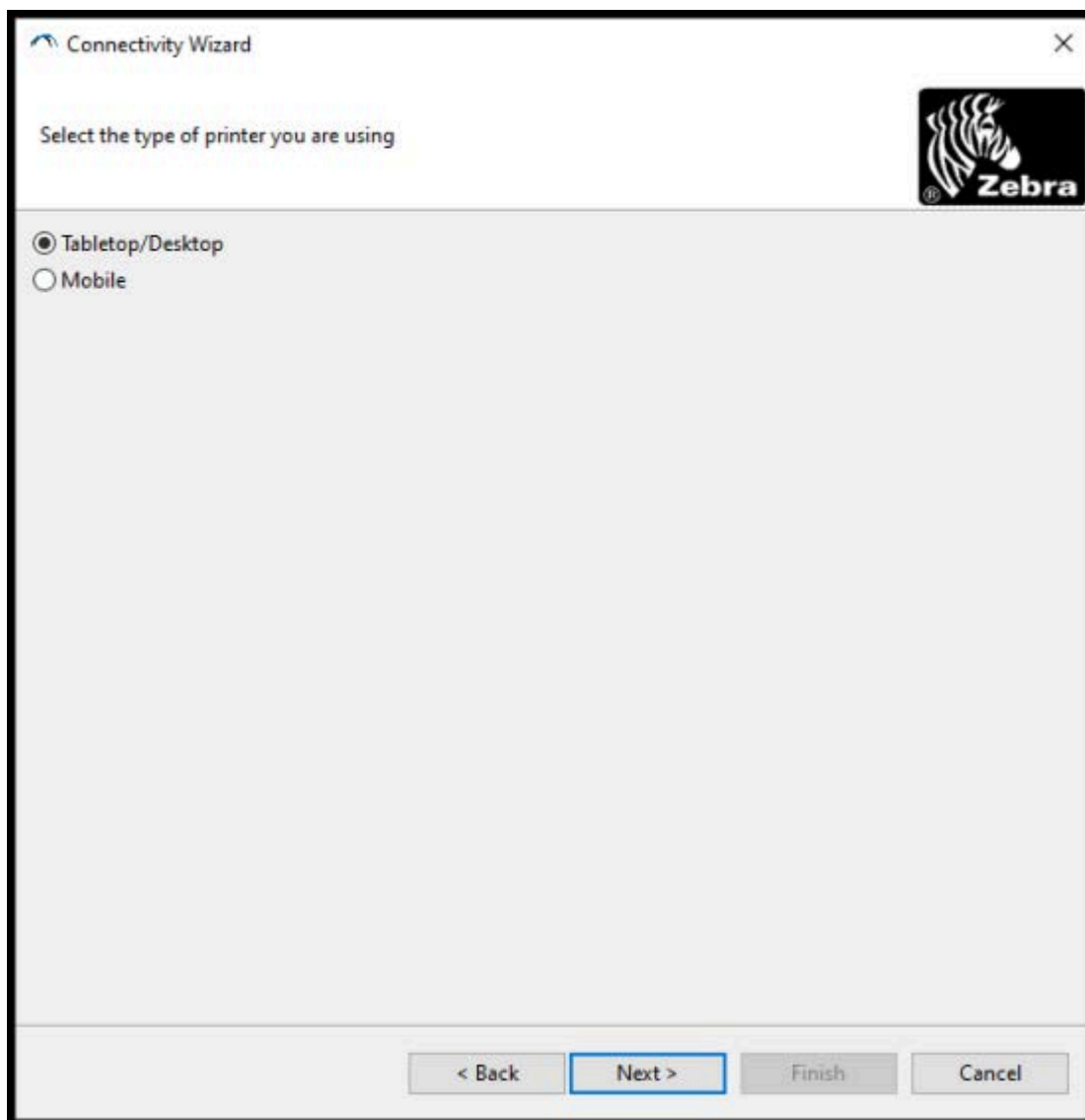
5. Click **Next**.

The wizard prompts you to select the print server device to configure.



6. Select **Wireless**, then click **Next**.

The wizard prompts you for the type of printer you are using.



7. Select the type of printer you are using, then click **Next**.

The wizard prompts asks you to enter the wireless IP details.

8. Enable the **DHCP** (dynamic) option or the **Static** IP option.

If you chose **DHCP**...

Click **Next** and proceed to the next step in this procedure.

Setup for Windows

If you chose **Static...**

Enter the **IP Address**, Default Gateway, and Subnet Mask for the wireless print server and click **Next**. Contact your network administrator for the correct values to use.

The Wireless Settings window opens.

9. Enter the **ESSID**.



NOTE: You must set the **ESSID** (and passphrase, if you use one) at your access point before completing these steps.

10. From the **Security Mode** dropdown, select the appropriate mode.

If you select...	Perform these additional steps for the option you selected, then proceed to the next step.
None (no security protocol)	Skip this step.

If you select...	Perform these additional steps for the option you selected, then proceed to the next step.
WEP 40-Bit or WEP 128-Bit	In the WEP Options section of the window, enter the following values: • Authentication Type • WEP Index • Encryption Key Storage • WEP Keys
EAP-TLS, EAP-TTLS, EAP-FAST, or WPA-EAP-TLS	In the EAP section, if necessary, enter an Optional Private Key .
PEAP, LEAP, WPA-EAP-TTLS, WPA-PEAP, or WPA-LEAP	In the General Security section, enter the Security Username and Password .
WPA-PSK	In the WPA section, select the PSK Type , and enter the PSK Name .
WPA-EAP-FAST	In the General Security section, enter the Security Username and Password. In the EAP section, if needed, enter an Optional Private Key.
KERBEROS	Under Kerberos Settings, enter values for Kerberos User, Kerberos Password, Kerberos Realm, and Kerberos KDC.  NOTE: KERBEROS is NOT supported on Internal Wireless Plus print servers or radio cards.

11. Click **Next**.

12. In the Wireless Settings window, click **Advanced Options**.

The Advanced Wireless Settings window opens.

Advanced Wireless Settings

General

Radio Type: 802.11 b/g (2.4 GHz) ▼

Operating Mode: Infrastructure ▼

Preamble: Long ▼

Antennas

Transmit: Diversity ▼

Receive: Diversity ▼

Transmit Power: 100 ▼

Channel Mask

The channel mask specifies the radio channels the printer will use to communicate over.

Preset channel mask: Use Printer Setting ▼

User specified channel mask: 0x

802.11n Settings

Greenfield Mode: Off ▼ Aggregation: Off ▼

Reduced Interframe: Off ▼ 20 MHz Mode: Off ▼

20 MHz Short Guard: Off ▼ 40 MHz Short Guard: Off ▼

Front Panel Wireless Password

The wireless password, which is separate from the printer password, protects the wireless LCD items from being seen or changed when it is set to a non-zero value. The factory default is 0000.

Old Password 0 New Password 0

☒ Skip the detection of a wired printserver on boot up?

Note: If running a wireless printer only this will greatly reduce the time needed to associate on the network.

OK Cancel

13. Review and change the settings in the Advanced Wireless Settings window as needed.

14. Click **OK** to return to the Wireless Settings window.

15. Click **Next**.

Based on the selections you made in the preceding steps, the wizard creates a script file with the appropriate ZPL commands and displays them for your review.

If you selected **Tabletop/Desktop**, a dialog box similar to this one displays:



16. Decide if you will send the script immediately, or save it for use at a later time.

Sending a ZPL Configuration Script to the Printer

Complete printer Wi-Fi server setup by sending the ZPL script to the printer through the port you selected in [Configuring the Printer Using ZebraNet Bridge's Connectivity Wizard](#) on page 154. You may want to save the ZPL script and use it to restore the printer network configuration if the printer is reset to its factory defaults in the future. Saving the script will also allow you to quickly configure multiple printers if they need the same settings.

1. Verify that the printer is connected to the computer through the wired cable connection to the USB port.

2. If the printer is switched off, turn printer power ON.
3. In the Connectivity Wizard: Review and Send ZPL for Wireless window, click **Finish**.

The computer sends the ZPL script to the printer through the interface port. The Wireless Setup Wizard screen closes.
4. Turn printer power OFF and then back ON.
5. Observe the wireless status on the printer's indicator lights to confirm that you have set up your printer for wireless connectivity.
6. At this point, you can save the ZPL script for later use with this printer and to configure other printers that may need the same network settings. To save the script:
 - a) In the Review and Send ZPL for Wireless window, highlight the script, right-click it, and select **Copy**.
 - b) Open a text editor such as Notepad and paste the script into the application.
 - c) Save the script.
 - d) Back in the Connectivity Wizard, you may click **Cancel** to exit the Wizard without sending the script to the printer at this time.

To configure either the same printer again (in case it was reset to its factory defaults) or to configure other printers with the same settings, send the saved ZPL script file to the printer through the connection of your choice as detailed in the prior steps in this procedure.

Configuring the Printer Using Bluetooth

The Zebra Setup Utilities provides a quick and easy way to configure a Bluetooth wireless connection with your printer.

1. Double-click the **Zebra Setup Utilities (ZSU)** icon on your desktop.
2. Connect your computer and the printer with a USB cable.
3. On the first ZSU screen, highlight the printer displayed in the window and click **Configure Printer Connectivity**.

4. On the Connectivity type screen, select **Bluetooth**, then click **Next**.



5. On the Bluetooth Settings screen, check **Enabled** to enable Bluetooth functionality.
6. In the **Friendly Name** field, set the Bluetooth name of the device that you will use to discover the device on the network.

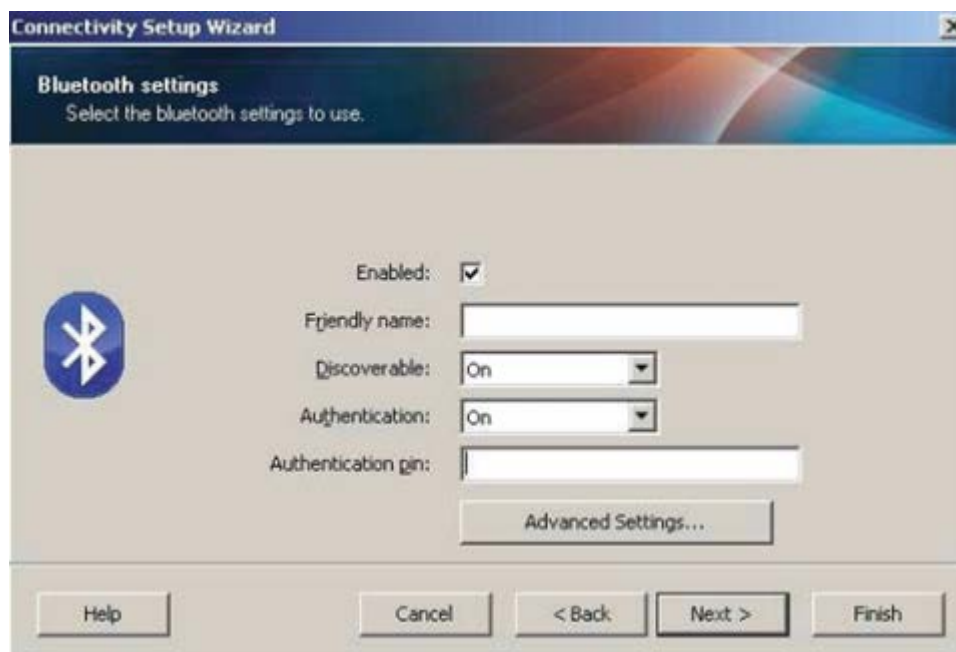
This is the name that the central device will apply to the printer.
7. If you want the device to appear when central devices are looking for new devices to pair with, set the **Discoverable** field to **On** . If not, set it to **Off**.
8. Set **Authentication** to **On**.



NOTE: This setting does not exist in Link-OS Profile Manager, but you must set it to **On** if you want to enter a PIN in the Zebra Setup Utilities. The actual authentication setting on the printer is set by accessing **Advanced Settings > Security Mode**.

9. The values set in the **Authentication PIN** field will vary depending on the Bluetooth (BT) version of the central device. If the central uses BT v2.0 or older, enter a numeric value in this field. You will be

prompted to enter this same value on the central device to verify pairing. Also select **Security Mode 2** or **3** in **Advanced Settings** for PIN pairing.



NOTE: If the central device uses BT v2.1 or newer, this setting has no effect. BT v2.1 and newer versions use Secure Simple Pairing (SSP) which does not require the use of a PIN.

10. To view Advanced Bluetooth settings, click the **Advanced Settings...** button.



NOTE: For more information on Advanced Settings, refer to the Wired and Wireless Print Server Guide.

11. Click **Next** to continue configuring your printer.

The SGD commands needed to configure your printer will be displayed.

12. On the Send Data screen, click on the printer that you want to send the commands to, or click **File** to save the commands to a file for reuse later.

13. To send the commands to the printer you chose, click **Finish**.

The printer will update and reboot.

14. You may disconnect the USB interface from your printer now.

15. To complete the Bluetooth pairing process, enable Bluetooth device discovery on your central device and follow the instructions provided by the central device.

Connecting the Printer to a Windows 10 OS

Before adding (also called pairing) a Bluetooth-enabled device to your central device, make sure the device to be paired is turned on and discoverable.



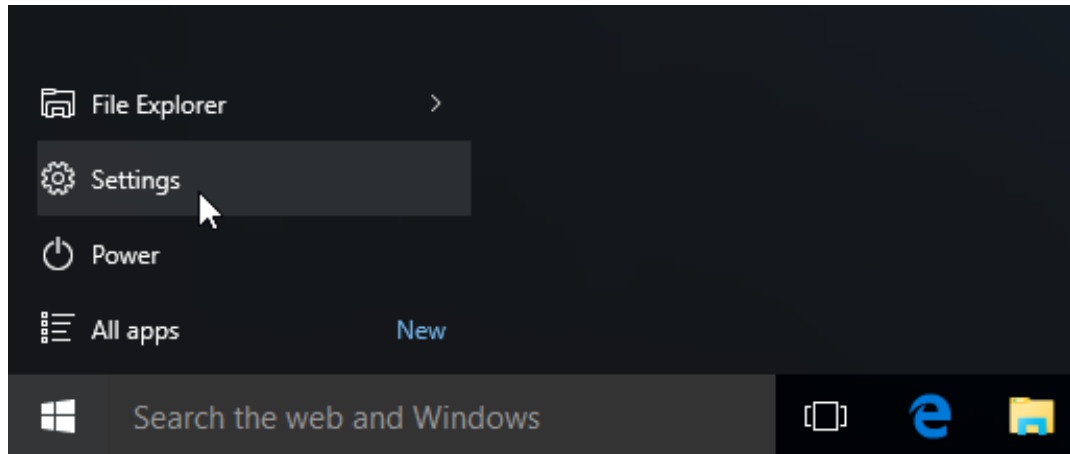
NOTE: Your Windows device may need a Bluetooth adapter to connect to a Bluetooth device. Check with your Windows device user guide for details.

Some non-Microsoft Bluetooth dongles and built-in Bluetooth devices in the host PCs have ONLY marginal driver support for Secure Simple Paring (SSP) printing and may not complete the **Add printer** wizard normally.

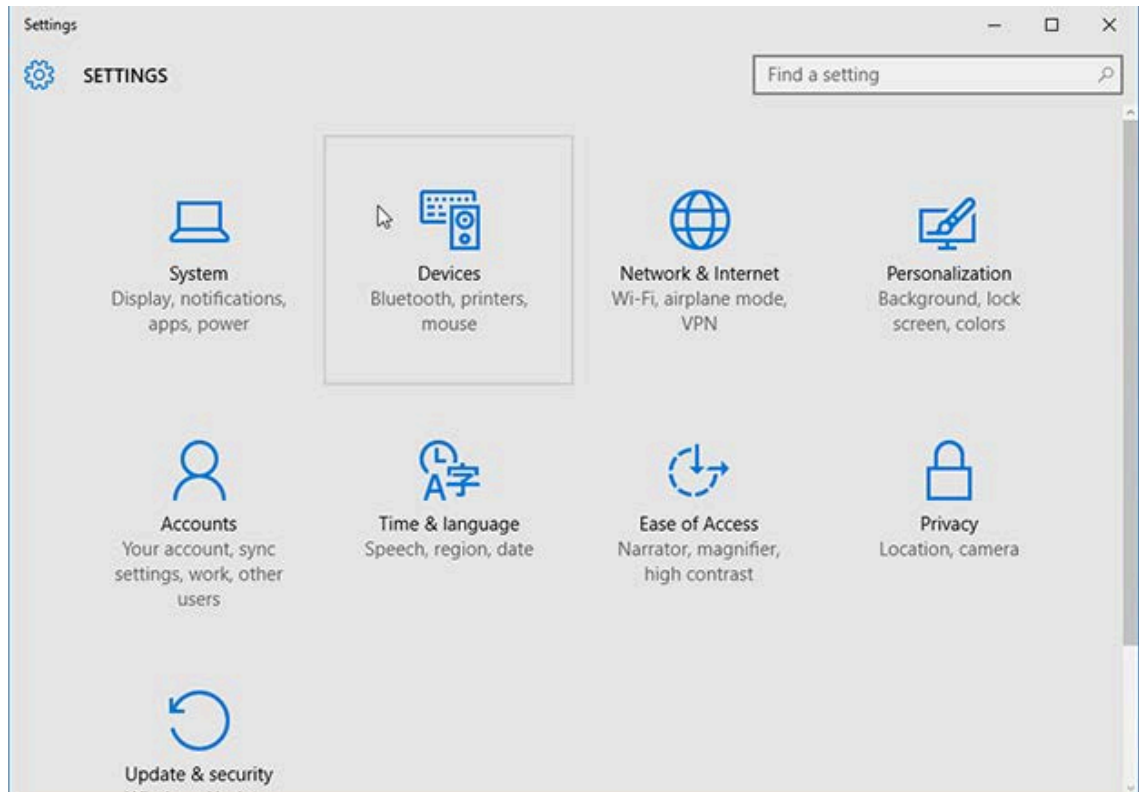
You may need to access **Bluetooth Devices** under Windows **Settings** and activate SPP for the 'device', that is, the Bluetooth-capable printer you are installing.

Install the printer to a local printer (USB, for your printer), and then change the **Port** after the completing the installation to SPP (virtual serial port) COM port.

1. Click the **Windows Start** () button, then select **Settings**.



2. Click **Devices**.

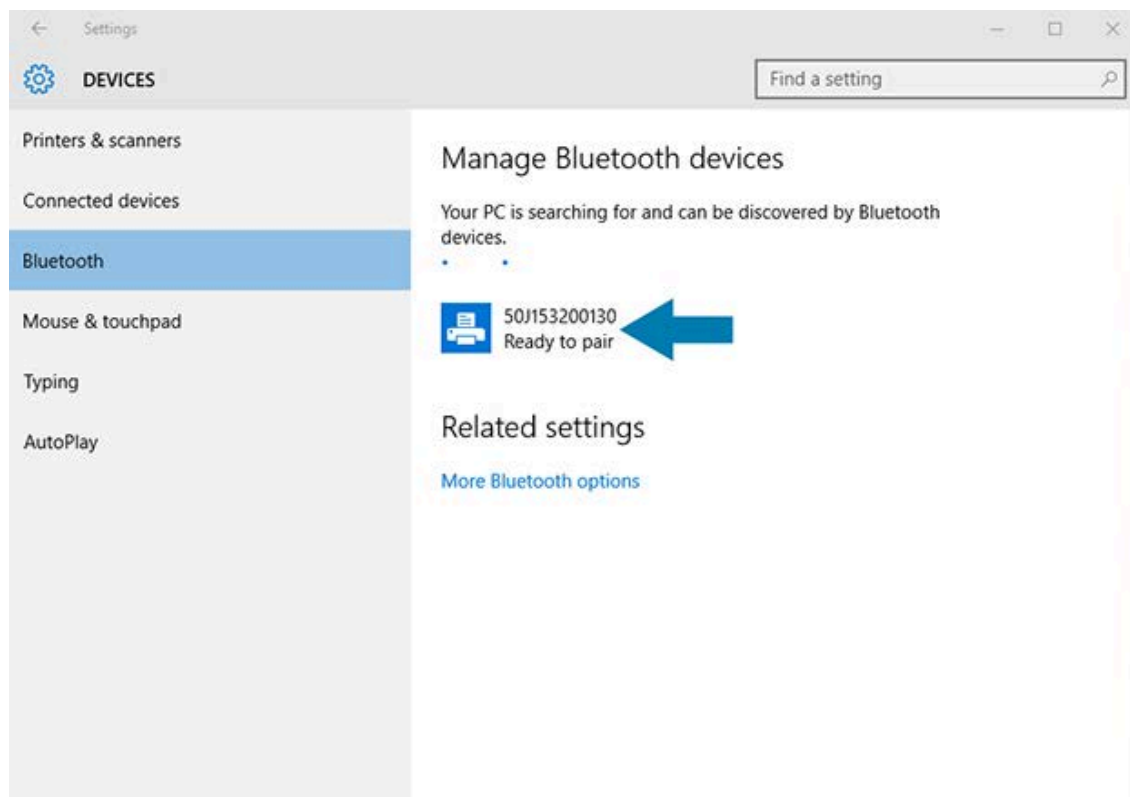


3. Click **Bluetooth**.

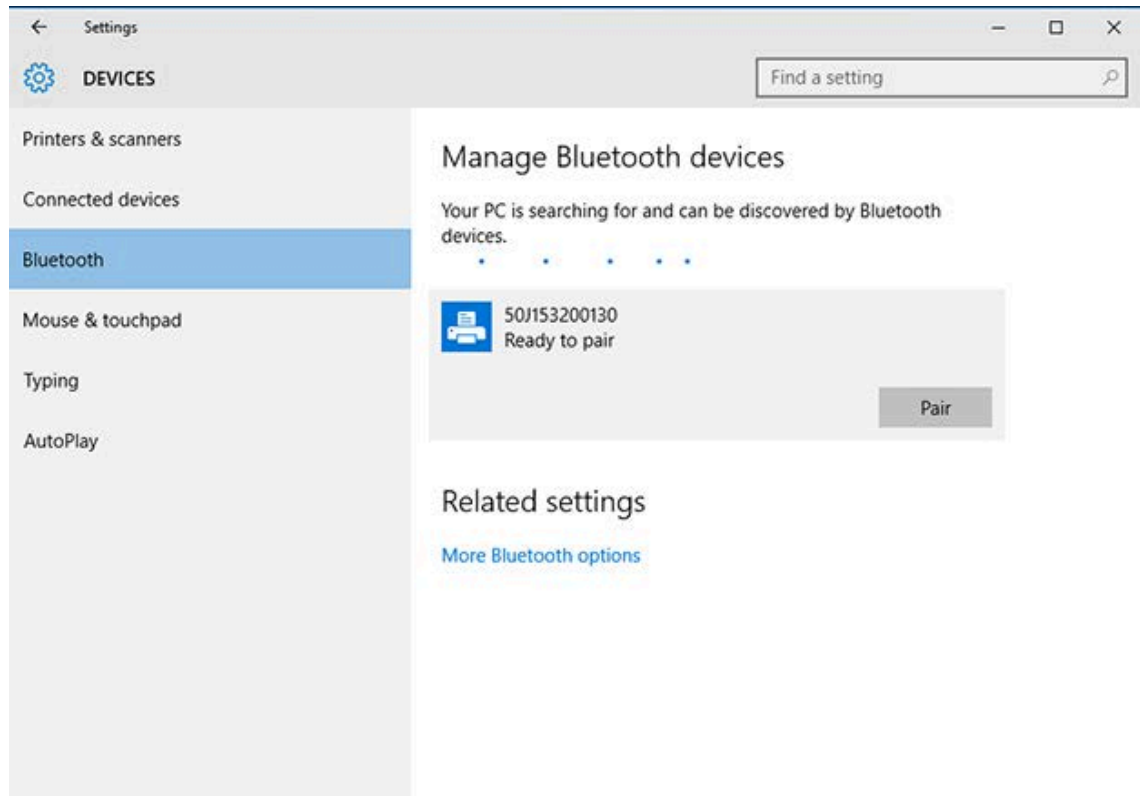


NOTE: If your PC does not have Bluetooth installed, the Bluetooth category will not be displayed in the list of device categories.

The printer is identified by its serial number as shown here.

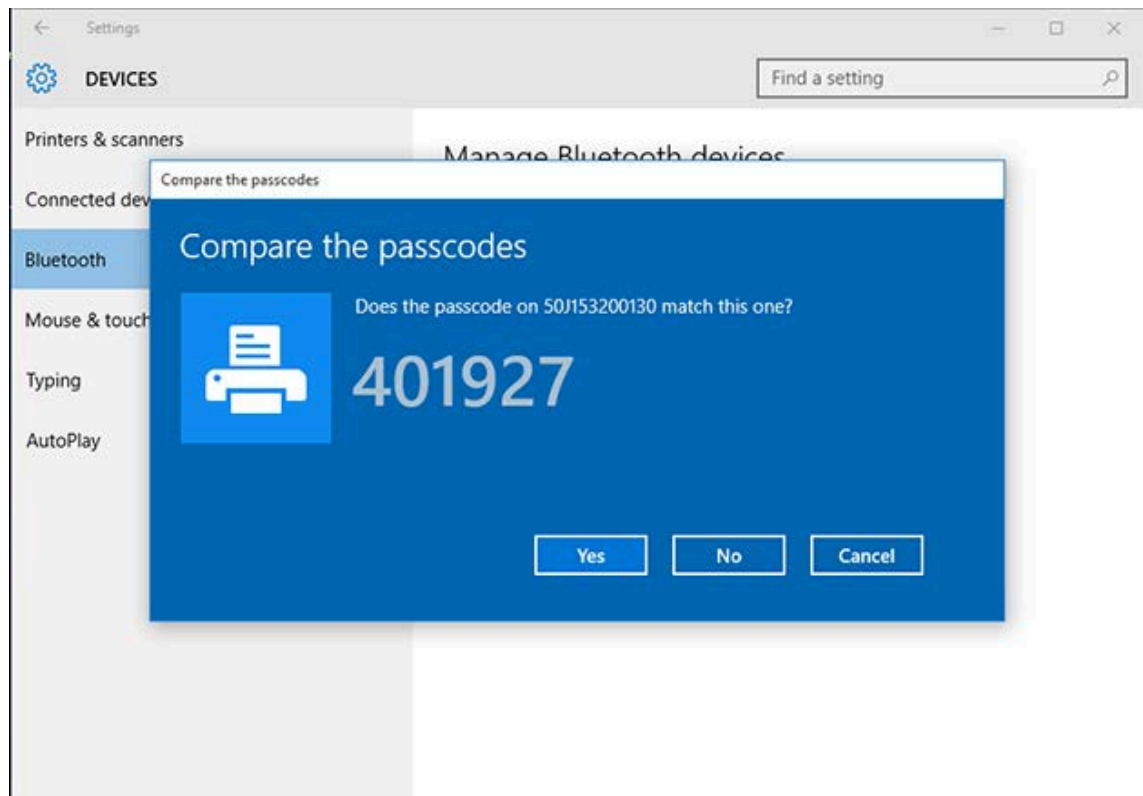


4. Click the printer icon, then click **Pair**.

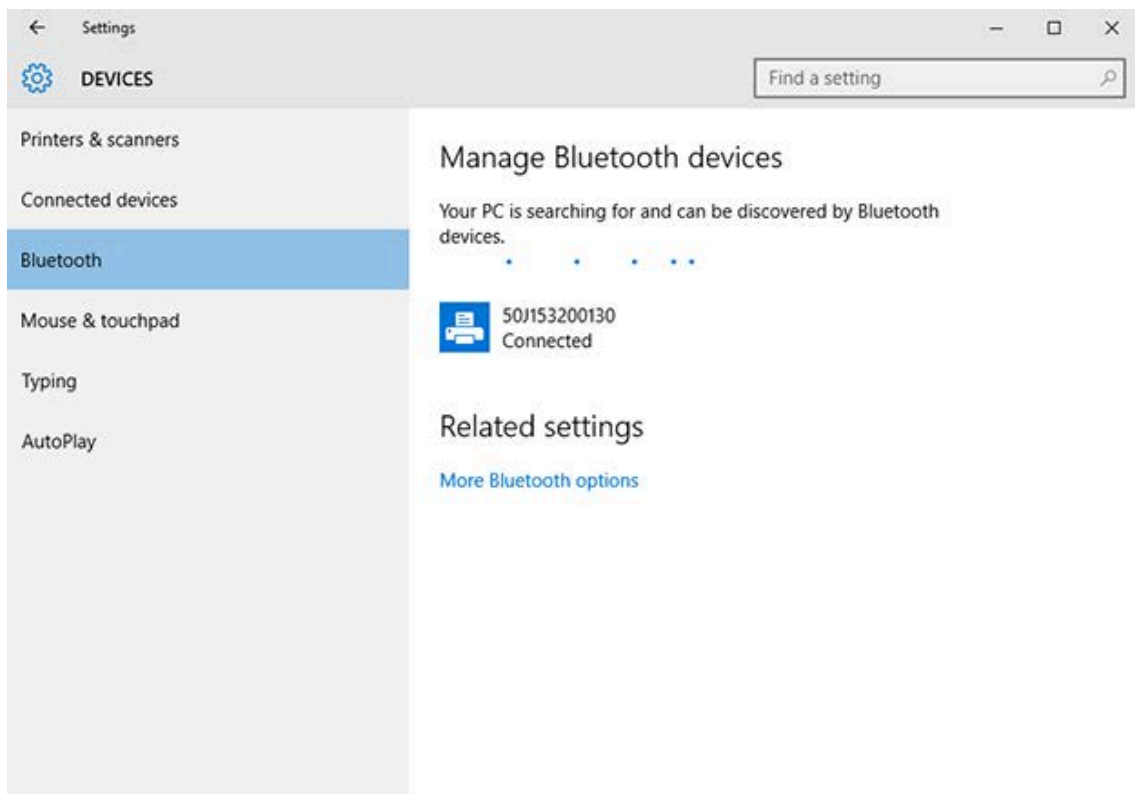


The printer prints a passcode.

5. Compare the passcode with the one on the screen. If they match, click **Yes**.



The printer status changes to Connected when pairing is complete.



After Your Printer is Connected

When you have established basic communication to your printer, you may want to test printer communications and then install other printer related applications, drivers, or utilities.

Verifying printer operation is a relatively simple process:

- For Windows operating systems, you can use the Zebra Setup Utility or the Windows **Printers and Faxes** feature in the **Control Panel** to access and print a test label.
- For non-Windows operating systems, you can send an ASCII text file to the printer with a single command (~WC) instructing it to print a configuration status report.

Test Printing with Zebra Setup Utilities

1. Open the Zebra Setup Utilities.
2. Click on the newly-installed printer's icon to select the printer.
3. Click **Open Printer Tools**.
4. Access the Print tab, click on **Print configuration label**, and click **Send**.

The printer should print a configuration report.

Test-Printing with the Windows Printer and Faxes Menu

1. Click the Windows **Start** menu button or the **Control Panel** to access the Printers and Faxes menu, then open the menu.
2. Select the newly-installed printer's icon to select the printer, and right-click to access the printer **Properties** menu.
3. From the printer's General tab window, click **Print Test Page**.

The printer prints a Windows test print page.

Test-Printing with an Ethernet Printer Connected to a Network

You can test-print on an Ethernet printer connected to a network (LAN / WLAN) using either an MS-DOS command from the command prompt or selecting **Run** from the Windows **Start** menu:

1. Create a text file with this ASCII string: ~WC
2. Save the file an arbitrary filename such as TEST.ZPL.
3. Find the IP address on the printer Configuration Report – Network Status printout.
4. From a central device that is connected to the same LAN or WAN as the printer, type the following in a web browser window address bar and press **Enter**: ftp x.x.x.x (where the x.x.x.x is the IP address of your printer).

For an IP address that reads 123.45.67.01, you would enter ftp 123.45.67.01

5. Type the word put followed by the filename and press **Enter**.

For a test print instruction to include the filename TEST.ZPL, you would type put TEST.ZPL

The printer prints a new Print Configuration Report.

Test-Printing with a Copied ZPL Command File for Non-Windows Operating Systems

1. Create a text file with this ASCII string: ~WC
2. Save the file using an arbitrary filename such as TEST.ZPL
3. Copy the file to the printer. For DOS, sending this file to a printer connected to the system's serial port would be as simple as using this command: `COPY TEST.ZPL COM1`



NOTE: Other interface connection types and operating systems will require different command strings. See your OS documentation for detailed instructions on how to copy to the appropriate printer interface for this test.

Print Operations

This section provides general information on media and print handling, font and language support, and the setup of less common printer configurations.

Thermal Printing

Zebra ZD Series printers use heat to expose direct thermal media or use heat and pressure to melt and transfer 'ink' to the media. Extra care should be taken to avoid touching the printhead which gets hot and is sensitive to electrostatic discharge.



CAUTION—HOT SURFACE: The printhead may be hot and could cause severe burns. Allow the printhead to cool.



CAUTION: To protect from damaging the printhead and risk of personal injury, AVOID touching the printhead. Use ONLY the cleaning pen to perform printhead maintenance.



CAUTION—ESD: The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead and other electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components under the top cover.

Determining Your Printer's Configuration Settings

The ZD Series printer is capable of printing a configuration report listing printer settings and hardware details.

Included in this report are:

- operational status (darkness, speed, media type, etc.)
- installed printer options (network, interface settings, cutter, etc.)
- printer details (serial number, model name, firmware version, etc.)

For instructions on printing this label...	See Test Printing with the Configuration Report on page 131.
For information on interpreting the configuration report and the associated programming command and command states identified in the report.	See Managing the ZPL Printer Configuration on page 294 to learn how to interpret the configuration report and the associated programming command and command states listed in the report.

Selecting a Print Mode

Use a print mode that matches the media being used and the printer options available. The media path is the same for roll and fanfold media.

To set the printer to use a specific print mode, see instructions on using the ^MM command in the ZPL Programming Guide. To download this manual, go to one of the printer information links listed in zebra.com/support.

These print modes are available with your printer:

Tear Off (default; available with any printer option and with most media types)	The printer prints the labels as it receives them. The labels can be torn off after they print.
Peel (available with the Label Dispenser option)	The printer peels the label from the liner while printing. It pauses to print the next label until the current one is removed.
Cutter (available with the factory-installed-only Cutter option)	The printer cuts each label after it is printed.

Adjusting Print Quality

Print quality is affected by a combination of the heat (or density) setting of the printhead, print speed, and the media loaded. Experiment with these settings to find the optimal mix for your application.

You can set print quality using the **Configure Print Quality** routine in Zebra Setup Utilities.

Use the printer's Print Quality Report (through a FEED Self Test) to print a range of labels that help you identify print DARKNESS and SPEED settings for optimizing general print and barcode quality. For details, see [Printing a Print Quality Report \(FEED Self-Test\)](#) on page 246.

Before adjusting any settings, verify the printer's media settings by printing a Printer Configuration label. See [Test Printing with the Configuration Report](#) on page 131 for details.

- Adjust the print darkness (or density) setting using one of the following methods:
 - the Set Darkness (~SD) ZPL command (see the ZPL Programming Guide for details)
 - the [Darkness Control Switch](#) on page 174
- To adjust the print speed, use one of these methods:
 - your Windows printer driver
 - application software such as ZebraDesigner. You can download this software from zebra.com/zebradesigner.



NOTE: Media manufacturers may recommend specific speed settings when using your printer with their media. The recommended speed may be lower than your printer's maximum speed setting.

- To reduce the maximum distance for automatic media type detection and sensing, use the ZPL Maximum Label Length command (^ML).

The minimum distance should be no less than twice the longest label to be printed. If the largest label being printed was a 2 by 6 inch label, the maximum label (media) length detection distance can be reduced from the default distance of 39 inches down to 12 inches.

Darkness Control Switch

This switch allows you to modify the darkness setting to accommodate the normal minor variations that exist across media and printers. This switch control reduces the need to change the printer's program settings or driver settings as you change printing supplies or .



1	Darkness control switch
---	-------------------------

The control switch has three settings:

Position	Setting	Effect
Left	Low (default)	No effect. Makes no change to the actual Darkness setting as set by programming or driver setting.
Middle	Medium	Increases ZPL darkness by three levels. If the printer is set to the default darkness level of 20, the actual darkness applied while printing will increase to 23.
Right	High	Increases ZPL darkness by six levels. Adds six darkness levels to the set darkness level.



IMPORTANT: Setting the Darkness too high or too low may reduce barcode readability.

Adjusting Print Width

You must set the print width before you use the printer for the first time. You must also set it when you load media into the printer that is of a different width than the one you loaded for the prior batch of printing.

To set the print width, you can use one of the following:

- your Windows printer driver.
- application software such as ZebraDesigner.

- the ZPL Print Width (^PW) programming command. (See your ZPL Programming Guide for details.)

Printing on Fanfold Media

Use this procedure to print on fanfold media.

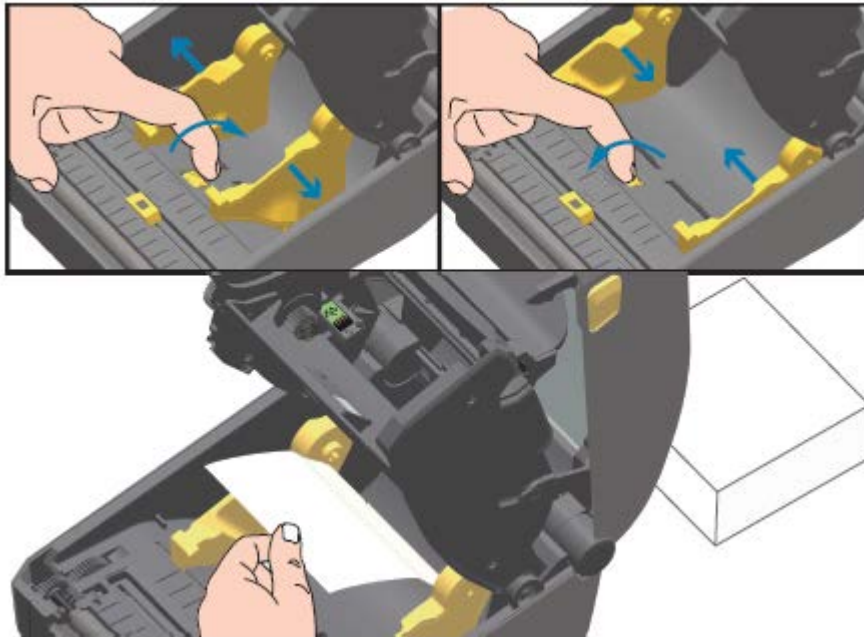
Printing on fanfold media requires you to adjust the media guides stop position.

1. Open the top cover.



This image shows the fanfold media path.

2. Adjust the media guide stop position with the Slide Lock (gray).
 - a) Use a piece of the fanfold media to help set the stop position.
 - b) Push the gray locking slide on the left-hand roll holder towards the back of the printer to lock the roll holder position.
 - c) Pull it forward to release the lock.



3. Insert the media through the slot at the rear of the printer, and place the media between the media guide and roll holders.



4. Close the top cover.



NOTE: The media guide stop position may need further adjustment if, after printing or after pressing **FEED** to advance several labels:

- the media does not track down the center (moves from side to side), or
- the sides of the media (liner, tag, paper, etc.) are frayed or damaged when exiting the printer

If additional adjustment does not correct the problem, route the media over the two roll-holding pins on the media guide.

You can also provide additional support for thin media by placing an empty roll core (of the same width as the fanfold media stack) between the roll holders.

Printing with Externally-Mounted Roll Media

Your printer accommodates externally-mounted roll media (as it does for fanfold media). It requires a media-roll-and-stand combination to ensure low (initial) inertia when pulling the media off the roll.

Make note of these considerations when using externally-mounted roll media:

- The media should ideally enter the printer from directly behind the printer and pass through the fanfold media slot in the rear of the printer. (Use the instructions in [Printing on Fanfold Media](#) on page 175 to insert the externally-mounted media into the printer.)
- The media should move smoothly and freely. It should not slip, skip, jerk, bind and then move, etc. when mounted on your media stand.
- The movement of the media roll should not be impeded by contact with any printer or other surfaces.
- The printer should be placed such that it may not slip or lift up away from its operating surface while printing.

Replacing Supplies while Using the Printer

If the media supply (ribbon, labels, receipts, tags, tickets, etc.) runs out while printing, leave the printer power ON while reloading. (Data loss occurs if you turn off the printer). After you load a new roll of media or ribbon, simply press **FEED** to resume printing.

Using the Label Dispenser Option

The label dispenser option allows you to print a label and have the backing material (liner/web) automatically removed. When printing multiple labels, removing the dispensed (peeled) label triggers the printer to print and dispense the next label.

To use label dispense mode, set the printer's Media Handling setting to Peel-Off in the printer driver or using the Zebra Setup Utility Configure Printer Settings wizard.

Alternatively, send the ZPL programming commands to the printer. When programming in ZPL, you can use the command sequences shown below to configure the printer to use the dispenser option:

- ^XA ^MMP ^XZ
- ^XA ^JUS ^XZ

1. Load your labels into the printer. Close the printer and press **FEED** until a minimum of 100 millimeters or 4 inches of exposed labels exit the printer. You can leave the labels on the liner.



2. Lift the liner over the top of the printer. Pull the gold latch in the center of dispenser door away from the printer and the door will open.



3. Insert the label liner between the dispenser door and the printer body.



4. Close the dispenser door while pulling the end of the label liner tight.



5. Press and release **FEED** (Advance) one or more times until a label gets presented for removal.



6. During the print job, the printer will peel off the backing and present a single label. Take the label from the printer to allow the printer to print the next label.

If you did not activate the label taken sensor to detect the removal of the dispensed (peeled) label with software commands, the printed labels will stack and may bind the mechanism.

Using the Linerless Options

The Linerless Media Tear-Off and Cutter options operate much like the standard media printers. These options include an additional sensor to detect when a printed and presented label is taken from the printer.

Linerless printers require special cleaning processes to maximize the platen (drive) roller and special non-stick surfaces in the printer and media path areas.

The Linerless printing option allows you to print a multi-label format/form that stops between each label. Removing the dispensed (peeled) label triggers the printer to print and dispense the next label until all labels have been printed.

To use dispense mode, set MEDIA HANDLING to PEEL-OFF in the printer driver or with the Zebra Setup Utilities using the Configure Printer Settings wizard.

Alternatively, send the appropriate ZPL programming commands to the printer. When programming in ZPL, you can use the command sequences shown below to configure the printer to use the dispenser option:

- `^XA ^MMP ^XZ`
- `^XA ^JUS ^XZ`

To download the ZPL Programming Guide, go to one of the product information links listed in [About this Guide](#) on page 11.

Linerless Printing

Linerless media loads the same as models with the standard tear-off bezel or the general factory-installed cutter options.

See [Loading Media](#) on page 111 for information on loading the media.

- Before reloading media:
 - Clean the printhead and inspect the media path and platen roller for build up of adhesive and debris. (See [Cleaning the Printhead](#) on page 201 and [Cleaning the Media Path](#) on page 204.)
 - Remove particles with the adhesive side of your linerless media.
 - Lightly touch the media path and platen roller with the label to lift particles off the exposed area of the platen roller and the media path areas. See [Cleaning and Replacing the Platen](#) on page 213.
- Remove new media from its protective wrapping ONLY when you are ready to place it in the printer. If new linerless media roll is opened well prior to loading or is set on its side, it may pick up contaminants and stick to surfaces.



IMPORTANT: The platen roller can accumulate adhesive on the outer edges of the roller. After using many rolls of media, these rings of adhesive may get dislodged when using printer. These particle clumps can then get transferred to other areas. Clean the platen as needed. (See [Cleaning and Replacing the Platen](#) on page 213.)

Sending Files to the Printer

Graphics, fonts and programming files can be sent to the printer from supported Microsoft Windows operating systems using Link-OS Profile Manager, Zebra Setup Utilities (and driver), ZebraNet Bridge or Zebra ZDownloader available from the Zebra website at zebra.com/software.

Ribbon Cartridge Programming Commands

The ZD420 Ribbon Cartridge printer offers several Set-Get-Do (SGD) programming commands to support the use of the ribbon cartridge. See the ZPL Programmer's Guide for more details on SGD commands and, in particular, SGD ribbon cartridge commands.

The following are examples of SGD ribbon cartridge commands.

```
! U1 getvar "device.feature.ribbon_cartridge"
! U1 getvar "ribbon.cartridge.part_number"
! U1 getvar "ribbon.cartridge.authenticated"
! U1 getvar "ribbon.cartridge.length_remaining"
! U1 getvar "ribbon.cartridge.serial_number"
! U1 getvar "ribbon.cartridge.width"
! U1 getvar "ribbon.cartridge.type"
! U1 getvar "ribbon.cartridge.length"
! U1 getvar "ribbon.cartridge.inserted"
```

```
ribbon.ribbon_low.warning : 50 , Choices: off,5,10,15,25,50,75,100
! U1 getvar "ribbon"
! U1 getvar "ribbon.ribbon_low.warning"
```

```
! U1 setvar "ribbon.ribbon_low.warning" "75"  
! U1 setvar "ribbon.ribbon_low.warning" "off"
```

You can use Zebra Setup Utilities to send commands and receive status from the printer using the Open Communication With Printer feature.

You can download the ZPL Programming Guide from one of the printer information pages listed in [About this Guide](#) on page 11.

Printing with the Attached Battery Base and Battery Option

Printer operating procedures change slightly when using the battery. Power connections and power loss scenarios necessitate the differences in operation. The battery is designed to maximize battery life, maintain print quality, and have simple operation.

- Connecting the printer's external power supply to the battery will wake up the battery. The battery determines if charging is needed.
- The battery will not start charging until the battery's charge level is below 90% charge. This extends your battery's life.
- Once charging has begun, the battery will charge to 100% capacity and then go into Sleep Mode.
- The printer is receiving the external power passed through by the battery circuitry into the printer. The battery does not charge while printing or moving media.
- The battery uses very small amount of power during Sleep Mode to maximize the available charge stored in the battery.
- It takes about two hours to charge a fully discharged battery.

Uninterrupted Power Supply (UPS) Mode

In UPS mode, the printer receives external power which passes through the battery circuitry to the printer.

1. Press **Battery Control** to 'wake up' the battery and check the battery has charge.

After 60 seconds, the battery enters sleep mode. In this mode, the battery uses loss of external power as a cue to wake up and supply the printer with power.

2. Turn printer power OFF and ON as you normally would.

The printer does not require the battery be manually turned on to operate when it in UPS mode.

Battery Mode

The printer is powered by the battery only.

1. Press the **Battery Control** button to wake up the battery and check the battery has charge. After 60 seconds, the battery goes to sleep if the printer has not been turned on yet.



1	Battery status and charge indicators
2	Battery power base
3	Power interface
4	Power input
5	Battery control button

2. Turn printer power ON.
3. Use the printer normally.
4. Check the battery charge status at any time by pressing **Battery Control**.
5. Change or charge your battery when the last battery charge level indicator is flashing.



NOTE: Your print operation may be interrupted if the battery charge is used up and the printer turns off.

Printer Fonts

The ZD Series printer supports multiple languages and fonts.

You can avail of advanced font mapping and scaling technology available with your printer using the ZPL programming language. ZPL commands support the following:

- Outline fonts (TrueType and OpenType)
- Unicode character mapping
- Basic bitmapped fonts
- Character code pages

The font capabilities of your ZD Series printer are programming-language dependent.

- For descriptions and documentation of the fonts, code pages, character access, listing fonts, and limitations for their respective printer programming languages, see the ZPL and the legacy EPL programming guides.
- For information on Text, Fonts and Character support, see your printer's programming guides.

Zebra has variety of utilities and application software to enable font downloads to the printer for the ZPL and EPL printer programming languages.



IMPORTANT: Some ZPL fonts that are factory-installed in your printer are license-restricted. They CANNOT be copied, cloned, or restored to your printer by reloading or updating the firmware.

If these license-restricted ZPL fonts are removed using an explicit ZPL object delete command, you will need to repurchase and reinstall them using a font activation and installation utility.

EPL fonts do not have this restriction.

Identifying Fonts in Your Printer

Fonts can be loaded into various storage locations in the printer. Fonts and memory are shared by the programming languages in the printer.

The ZPL programming language can recognize EPL and ZPL fonts. However, EPL programming can only recognize EPL fonts. See the respective programmer guides for more information on fonts and printer memory.

Specific to ZPL fonts:

To manage and download fonts for ZPL print operation	Use the Zebra Setup Utility or ZebraNet Bridge Utilities.
To display all of the fonts loaded in your printer	Send the ZPL command ^WD to the printer (see the ZPL Programmers Guide for details). In ZPL: • Bitmap fonts in the various printer memory areas are identifiable by the .FNT file extension. • Scalable fonts are identified with the .TTF, .TTE or .OTF file extensions. (EPL does not support these fonts.)

Localizing the Printer with Code Pages

For each printer programming language, ZPL and EPL, your printer supports two sets of language, region and character sets for the permanent fonts loaded onto the printer.

Your printer supports localization with common international character map code pages.

For ZPL code page support, including Unicode, see the ^CI command in the ZPL Programming Guide.

Asian Fonts and Other Large Font Sets

Both of the printer's programming languages, ZPL and EPL, support the large pictographic double-byte character Asian font sets. The ZPL programming language supports Unicode.

Asian language ideographic and pictographic fonts have large character sets with thousands of characters that support single language code page. To support for these large character sets, printer manufacturers adopted a double-byte (67840 maximum) character system (instead of the single-byte, 256-maximum character system used by Latin-based language characters to address this issue).

With the invention of Unicode came the ability to support multiple languages using a single font set. A Unicode font supports one or more code points (relate these to code page character maps) accessed in a standard method that resolves character mapping conflicts.

The number of fonts that can be downloaded to your printer is dependent upon the amount of available Flash memory not already in use and the size of the font to be downloaded.



NOTE: Some Unicode fonts are large-sized. These include MS (Microsoft) Arial Unicode font (23 MB) available from Microsoft and the Andale font (22 MB) offered by Zebra. These large font sets typically support a large number of languages.

Procuring and Installing Asian Fonts

Asian bitmap font sets are typically downloaded into the printer either by the printer user or an integrator.

ZPL fonts are purchased separately from the printer.

The following EPL Asian Fonts are available as free downloads from zebra.com:

- Simplified and Traditional Chinese (The SimSun scalable Simplified Chinese font is pre-loaded onto printers sold with a Chinese power cord.)
- Japanese—JIS and Shift-JIS mappings
- Korean including Johab
- Thai

EPL Line Mode (Direct Thermal Printers only)

Your direct thermal printer supports Line Mode printing. EPL Line Mode printing is designed to be command compatible with EPL1 programming language used in early model LP2022 and LP2042 printers. The Zebra 2800 series direct thermal printers also included Line Mode printer language support. The Link-OS 4 inch Desktop continues Zebra's support of Line Mode.

Line mode printing is ideal for basic retail (also referred to as point of sale or POS), shipping, inventory, work flow control, and general labeling. EPL printers with Line Mode are versatile printers that can print a wide range media and barcodes.

Line mode printing only prints single lines the height of the largest element present in the line of text and data – barcode, text, a logo or simple vertical lines. Line mode has many limitations due to the single line of print: no fine element placement, no overlapping elements, and no horizontal (ladder) barcodes.

- To enter Line Mode printer operation, send the printer the EPL `OEPL1` command. See the EPL Programmers Guide (Page Mode) or the EPL Line Mode Programmers Guide for details.
- Exit Line Mode printer operation by sending the printer the `escOEPL2` line mode command. See the EPL Line Mode Programming Guide for details.

- When Line Mode is active, ZPL and EPL (EPL2) Page Mode programming is processed as Line Mode programming and data.
- When default ZPL and EPL (EPL2) Page Mode are active, Line Mode programming will be processed as ZPL and/or EPL programming and data.
- Verify printer programming modes by printing out a printer configuration.

ZD620 and ZD420 Locking Printer Option

The locking printer option is available only as a healthcare model.

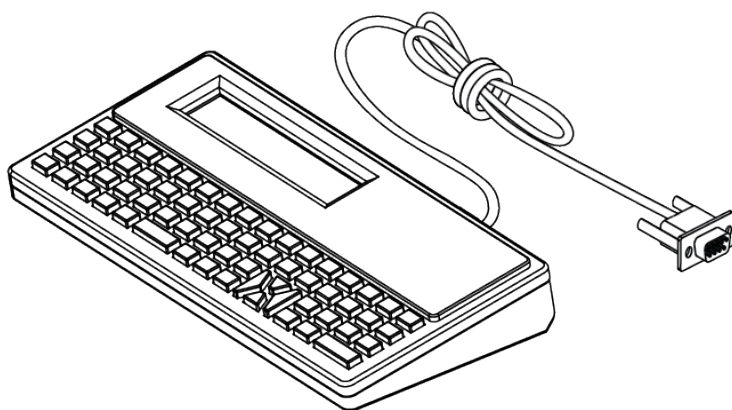
The following features are built into the locking printer:

- Lock and key access to the printer's media compartment.
 - Metal locking mechanism built into the printer.
 - Precision fabricated metal parts for repeatable movement.
 - Locking mechanism comes with two-keys.
- Supports industry recognized Kensington lock slot that allows you to lock printer to any immovable object such as a desk.
- Permanently sealed media window for added security (not serviceable).
- The **FEED** button is disabled to prevent user from manually advancing media while the media compartment is locked. The **FEED** key will always boot up in **FEED** disabled mode.
- Supports all media that is contained within the printer. Not recommend for fan-fold media.

For an illustration of the locking printer features, see [ZD620 Locking Printer Features](#) on page 35.

Zebra Keyboard Display Unit (ZKDU) – Printer Accessory

The ZKDU is a small terminal unit that interfaces with the printer to enable ease of access to EPL or ZPL label forms stored in the printer.



The ZKDU is used for the following functions:

- List label forms stored in the printer
- Retrieve label forms stored in the printer
- Input variable data

- Printing labels
- Switching between EPL and ZPL to dual support both printer language format/form types. These can be stored and printed in late model Zebra label printers.



NOTE: The ZKDU is strictly a terminal. It does not store data or enable changing any printer or printing parameters.

Zebra Basic Interpreter (ZBI)

Customize and enhance your printer using the ZBI 2.0 programming language. ZBI 2.0 allows Zebra printers to run applications and take input from scales, scanners and other peripherals without a PC or network connection. ZBI 2.0 works with the ZPL printer command language so that printers can understand non-ZPL data streams and convert them into labels. That means the Zebra printer can create barcodes and text from input received, non-ZPL label formats, sensors, keyboards and peripherals. Printers can also be programmed to interact with PC based database applications to retrieve information to be used on printed labels.

- ZBI 2.0 can be activated by ordering a ZBI 2.0 Key Kit, or activated by purchasing a key from zebra.com.
- Use the ZBI Key Manager (also known as ZDownloader utility) to apply the key.
- An intuitive ZBI-Developer is used to create, test and distribute ZBI 2.0 applications. The built-in virtual printer allows you to quickly create, test and prepare programs for use.

ZBI-Developer is available on the Zebra web site at zebra.com/software. On the site, search for Zebra Basic Interpreter 2.0.

Setting the Power Failure Recovery Mode Jumper

The printer can be configured to restart itself unattended after a power failure with Power Failure Recovery Mode.



NOTE: Power Failure Recovery Mode is only available on printers with a printer connectivity module installed in your printer.

The printer connectivity modules have a power failure recovery jumper which is set to OFF by default. By setting the jumper to ON, you can make the printer automatically Power ON when it is plugged into an active AC power source (meaning printer power is ON).



NOTE: The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components.

1. Disconnect the DC power plug and any interface connectors from the rear of the printer.
2. Remove the module access door and connectivity module. See [Removing the Printer Connectivity Modules](#) on page 41 for instructions for ZD420 printer models.



NOTE: The connectivity module on a ZD620 printer model is removed in the same way a ZD420 printer's module is removed.

3. Move the AUTO (Power Failure Recovery Mode) jumper from the OFF position to the ON position.

4. Reinstall the connectivity module and module access door. See [Installing the Internal Ethernet \(LAN\) Module](#) on page 40 or [Installing the Serial Port Module](#) on page 39 for ZD420 printer models.



NOTE: A ZD620 printer connectivity module is installed in the same way a ZD420 printer connectivity module is installed.

5. Reconnect the printer DC power plug and interface cables to the printer.

USB Host Port and Link-OS Usage Examples

Browse the information in this section to learn how to use the printer's USB Host port with Link-OS features and Apps.

USB Host

The USB host port allows you to connect USB devices—such as a keyboard, scanner, or USB flash (memory) drive—to the printer.

Using a USB Host for Firmware Updates

Zebra "mirror" functions enable you to easily accomplish important printer management tasks. An example is updating printer firmware by downloading the files from the Zebra web site, copying them to a USB Flash drive (of up to a 1 TB storage capacity), and uploading them to printer memory.

See the printer ZPL programming manual for information on the Mirror and Set-Get-Do (SGD) `usb.mirror` commands.

Items Required for the Exercises

To perform the exercises in this document, you will need:

- a USB Flash drive that is up to 1 Terabyte (1 TB)



NOTE: The printer will not recognize drives larger than 1 TB.

- a USB keyboard.
- the various files listed in [Files for Completing the Exercises](#) on page 189.
- the free Zebra Utilities app for your smartphone (search for Zebra Technologies in the Google Play store).

Files for Completing the Exercises

Most of the files you need to complete the exercises in these section are available zebra.com in the form of a .ZIP file located on the Zebra web site here. Download this archive file and extract its contents on your computer.

Where possible, the contents of the files are shown in this section. Contents of files that include coded content—which cannot be viewed either as text or as an image—are not shown.

File 1: ZEBRA.BMP



File 2: SAMPLELABEL.TXT

```
^XA
^F0100,75^XGE:zebra.bmp^FS
^F0100,475^A0N,50,50^FDMirror from USB Completed^FS
^XZ
```

This simple label format prints the Zebra logo and a line of text at the end of the mirroring exercise.

File 3: LOGO.ZPL

Uses the Zebra logo bitmap file.

File 4: USBSTOREDFILE.ZPL

```
CT~~CD,~CC^~CT~
^XA~TA012~JSN^LT0^LH0,0^JMA^PR4,4~SD15^LRN^CI0^XZ
~DG000.GRF,07680,024,,[image data]
^XA
^LS0
^SL0
^BY3,3,91^FT35,250^BCN,,Y,N^FC%,{,#{^FD%d/%m/%Y^FS
^FT608,325^XG000.GRF,1,1^FS
^FT26,75^A0N,28,28^FH\^FDThis label was printed from a format stored^FS
^FT26,125^A0N,28,28^FH\^FDOn a USB Flash Memory drive. ^FS
^BY3,3,90^FT33,425^BCN,,Y,N
^FD>:Zebra Technologies^FS
^PQ1,0,1,Y^XZ
^XA^ID000.GRF^FS^XZ
```

This label format prints an image and text. This file will be stored on the USB memory device at the root level so that it can be printed.

File 5: VLS_BONKGRF.ZPL

File 6: VLS_EIFFEL.ZPL

File 7: KEYBOARDINPUT.ZPL

```
^XA
```

```

^CI28
^BY2,3,91^FT38,184^BCN,,Y,N^FC%,{,#{^FD%d/%m/%Y^FS
^F0385,75^XGE:zebra.bmp^FS
^FT40,70^A0N,28,28^FH\^FDThis label was printed using a keyboard input.
^FS
^FT35,260^A0N,28,28^FH\^FDThis label was printed by:^FS
^FT33,319^A0N,28,28^FN1"Enter Name"^FS
^XZ

```

This label format, used for the USB keyboard input exercise, does the following:

- Creates a barcode with the current date, based on your Real-Time Clock (RTC) setting. (RTC may not be present in the printer version you purchased).
- Prints the Zebra logo graphic.
- Prints fixed text.
- Prints text entered with the keyboard by a user.

File 8: SMARTDEVINPUT.ZPL

```

^XA
^CI28
^BY2,3,91^FT38,184^BCN,,Y,N^FC%,{,#{^FD%d/%m/%Y^FS
^F0385,75^XGE:zebra.bmp^FS
^FT40,70^A0N,28,28^FH\^FDThis label was printed using a smart device input.
^FS
^FT35,260^A0N,28,28^FH\^FDThis label was printed by:^FS
^FT33,319^A0N,28,28^FN1"Enter Name"^FS^XZ

```

The same label format as the previous label, only with different text printing. This format is used for the smart device input exercise.

Exercise 1: Copying Files to a USB Flash Drive and Performing USB Mirror

1. On your USB flash drive, create the following:
 - A folder called Zebra
 - In that folder, three sub folders:
 - appl
 - commands
 - files
2. In the /appl folder, place a copy of the latest firmware for your printer.



NOTE: Some functions may not work properly if there are underscores in a file name. Use periods instead.

3. In the /files folder, place the following file: ZEBRA.BMP
4. In the /commands folder, place the following files: SAMPLELABEL.TXT and LOGO.ZPL.

5. Insert the USB flash drive into a USB host port on the front of your printer.
6. Observe the user interface and wait. The following should happen:
 - If the firmware on the USB flash drive is different than what is on the printer, the firmware downloads to the printer. The printer then restarts and prints a printer configuration label. (If there is no firmware on the USB flash drive or if the firmware version is the same, the printer skips this action.)
 - The printer downloads the files in the /files folder and briefly shows the names of the files that are downloading on the display.
 - The printer executes any files in the /commands folder.
 - The printer restarts and then displays the message MIRROR PROCESSING FINISHED.
7. Remove the USB flash drive from the printer.

Exercise 1: Advanced User Information

See the ZPL Programming Guide for more information about these commands.

Enable/disable mirroring:

```
! U1 setvar "usb.mirror.enable" "value" – Values: "on" or "off"
```

-Enable/disable automatic mirroring that occurs when a USB Flash drive is inserted into the USB host port:

```
! U1 setvar "usb.mirror.auto" "value" – Values: "on" or "off"
```

Mirror operation retry number — Specify the number of times that the mirror operation will be repeated if it fails:

```
! U1 setvar "usb.mirror.error_retry" "value" – Values: 0 to 65535
```

Change file path from USB — Reprogram the file location the printer searches to retrieve files from the USB memory during mirror operations.

```
! U1 setvar "usb.mirror.appl_path" "new_path" – Default: "zebra/appl"
```

Change file path to USB — Reprogram the file location the printer places files into USB memory during mirror operations.

```
! U1 setvar "usb.mirror.path" "path" – Default: "zebra"
```

Enable/disable the USB host port

```
! U1 setvar "usb.host.lock_out" "value" – Values: "on" or "off"
```


Exercise 2: Print a Label Format from a USB Flash Drive

The Print USB File option allows you to print files from a USB mass storage device, such as a USB Flash drive. The files must be printable (.ZPL and .XML) and they must be located at the root level, not within a directory.

1. Copy the following files to your USB Flash drive:
 - File 4: USBSTOREDFILE.ZPL
 - File 5: VLS_BONKGRF.ZPL
 - File 6: VLS_EIFFEL.ZPL
2. Insert the USB Flash drive into a USB host port on the front of your printer.
3. On the printer's LCD users interface, press **LEFT SELECT** (located below the Home icon) to access the printer's Home Menu.
4. Use the **ARROW** buttons to scroll to the Tools menu, then press **SELECT** (checkmark icon)
5. Use the **ARROW** buttons to scroll to PRINT USB FILE.



The printer loads any executable files and processes them. The available files are listed. The **SELECT ALL** option is available to print all files on the USB Flash drive.

6. If necessary, use the up and down arrow to select USBSTOREDFILE.zpl.
7. Press **RIGHT SELECT** to select PRINT.

The label prints.

Exercise 3: Copy Files to/from a USB Flash Drive

The Copy USB File option allows you to copy files from a USB mass storage device to the printer's Flash memory E: drive.

1. Copy the files listed below to the root directory of your USB Flash drive. (Do not put these files into a sub-folder.)
 - File 7: KEYBOARDINPUT.ZPL
 - File 8: SMARTDEVINPUT.ZPL
2. Insert the USB Flash drive into a USB host port on the front of your printer.
3. On the printer's LCD users interface, press **LEFT SELECT** to access the printer's Home Menu.
4. Use the **ARROW** buttons to scroll to the Tools menu, then press **SELECT** (check mark icon).

5. Use the **ARROW** buttons to scroll to COPY USB FILE TO E:.



The printer loads any executable files and processes them. The available files are listed. You can use the **SELECT ALL** as necessary to copy all of the available files from the USB Flash drive.

6. Use the **UP ARROW** or the **DOWN ARROW** as necessary to select STOREFMT.ZPL.
7. Press **RIGHT SELECT** to select STORE.

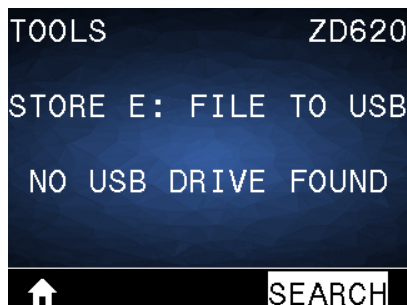
The printer stores the file in E: memory. The filename is converted to uppercase if in lowercase.

8. Repeat this process to select STOREFMTM1.ZPL.
9. Press **RIGHT SELECT** to select STORE.

The printer stores the file in E: memory. The filename is converted to uppercase if in lowercase.

10. Remove the USB Flash drive from the USB host port.

You can now copy these files from the printer to a USB Flash drive using the user menu item STORE E: FILE TO USB.



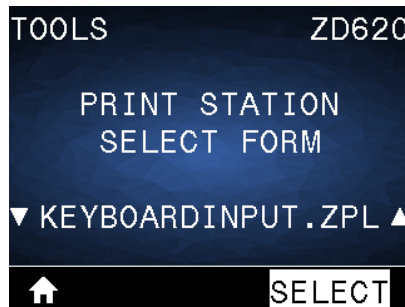
The **SELECT ALL** option is available to store all of the available files stored in the printer to the USB Flash drive. Any file with the .ZPL extension that is copied to the USB drive is post-processed such that its contents can be sent to a printer for normal execution.

Exercise 4: Enter Data for a Stored File with a USB Keyboard and Print a Label

The Print Station feature allows you to use a USB Human Interface Device (HID) — such as a keyboard or a barcode scanner — to enter ^FN field data into a *.ZPL template file.

1. After performing the previous exercise, plug a USB keyboard into a USB host port on the front of your printer.
2. Use the **ARROW** buttons to scroll to the Tools menu (🔧) and press **OK**.

3. Use the **ARROW** buttons to scroll to PRINT STATION.



The printer loads any executable files and processes them. The available files are listed.

4. Use the **UP ARROW** or **DOWN ARROW** as necessary to select KEYBOARDINPUT.ZPL.
5. Press **RIGHT SELECT** to choose SELECT.

The printer accesses the file and prompts you for the information in the ^FN fields in the file. In this case, it prompts you for your name.

6. Using the external keyboard, type your name and press **ENTER**.

The printer prompts you for the number of labels to print.

7. Using the external keyboard, specify the desired quantity of labels and press **ENTER**.

The specified number of labels is printed, with your name in the appropriate fields.

Using the USB Host Port and Near Field Communication (NFC) Capabilities

The Zebra Print Touch feature allows you to touch an Android-based, NFC-enabled device (such as a smart phone or tablet) to the printer's NFC logo to pair the device to the printer. You can use this feature to supply information for which you are prompted and then print a label using that information.



IMPORTANT: Some devices may not support NFC communication with the printer until you change their settings. If you encounter difficulties, consult your service provider or your smart device manufacturer for more information.

Figure 1 Print Touch Location (Passive NFC)



Exercise 5: Enter Data for a Stored File with a Smart Device and Print a Label

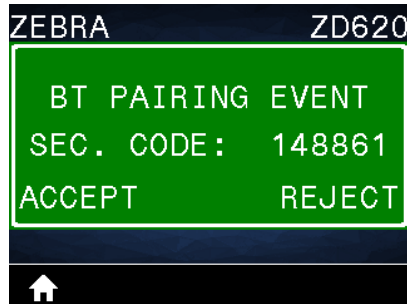


NOTE: The steps in this exercise may vary somewhat based on your smart device, on your service provider, or on whether you already have the free Zebra Utilities app installed on your smart device.

Refer to the Zebra Bluetooth User Guide for specific instructions for configuring your printer to use a Bluetooth interface. A copy of this manual is available at zebra.com/support.

1. If you do not have the Zebra Utilities app installed on your device, go to the app store for your device, search for the Zebra Utilities app, and install it.

2. Pair your smart device with the printer by holding the smart device next to the **Zebra Print Touch** icon on your printer.
 - a) If necessary, access the Bluetooth information about your printer using your smart device. For instructions, refer to the manufacturer's documentation for your device.
 - b) If necessary, select the Zebra printer's serial number to pair it with the device.
 - c) After your smart device has been detected by the printer, the printer may prompt you to accept or reject the pairing. Some smart devices will pair with the printer without this prompt.



The printer and your device are paired.

3. Open Zebra Utilities on the device you are using to manage your printer.

The Zebra Utilities main menu displays.



4. Perform these steps if you have an Apple device:. If not, skip to the next step.

- a) Tap **Settings** () in the lower right corner.
- b) Change the setting for **Get Labels From Printer** to **ON**.
- c) Tap **Done**.
- d) Tap **Files**.

The smart device gets data from the printer and displays it. This retrieval process may take a minute or more to complete.

5. Scroll through the formats shown and select **E : SMARTDEVINPUT . ZPL**.

Based on the ^FN field in the label format, the smart device prompts you for your name.

6. Enter your name at the prompt.
7. If desired, change the quantity of labels to print.
8. Tap **Print** to print the label.

Maintenance

This section provides routine cleaning and maintenance procedures.

Cleaning

Your Zebra printer may require periodic maintenance to keep it functional and printing high quality labels, receipts, and tags.



IMPORTANT: The cutter mechanism does NOT require maintenance cleaning. DO NOT clean the blade or mechanism. The blade has a special coating to resist adhesives and wear.

Using too much alcohol can result in contamination of the electronic components requiring a much longer drying time before the printer will function properly.



CAUTION—PRODUCT DAMAGE: DO NOT use an air compressor in place of the can of compressed air. Air compressors have micro-contaminants and particles that can get into the air system and damage your printer.



CAUTION—EYE INJURY: Use eye protection to protect your eyes from flying particles and objects when using compressed air to clean the sensors.

Cleaning Supplies

The following printer cleaning supplies are recommended for use with your printer:

These and other printer supplies and cleaning accessories are available from zebra.com/supplies.

Printhead cleaning pens	For routine printhead cleaning.
99% min. pure isopropyl alcohol	Use a labeled alcohol dispenser. Never re-moisten cleaning materials used to clean the printer. Always use clean supplies.
Fiber-free cleaning swabs	To clean the media path, guides, and sensors.
Cleaning wipes	To clean the media path and interior (for example Kimberly-Clark Kimwipes)
Can of compressed air	 CAUTION—PRODUCT DAMAGE: DO NOT use an air compressor in place of the can of compressed air. Air

compressors have micro-contaminants and particles that can get into the air system and damage your printer.



IMPORTANT: Be sure to read the precautions included with each cleaning procedure when cleaning the printer to avoid product damage and risk of personal injury.

Recommended Cleaning Schedule

Use a short description in a reference topic to briefly describe what the reference item does, what it is, or what it is used for.

Component / Area	Recommendations
Printhead	Clean the printhead after printing every five rolls of media printed. See Cleaning the Printhead on page 201.
Standard platen (drive) roller	As needed to improve print quality. Platen rollers can slip causing print image distortion and in worst case scenarios not move the media (labels, receipts, tags, etc.) See Cleaning and Replacing the Platen on page 213. Standard platen rollers come in two colors, black (203 dpi) and gray (300 dpi).
Linerless Platen (Drive) Roller	The linerless platen normally does not require cleaning. The adhesive side of the media picks up particles as you print. Clean if you observe a build-up of particles on the platen roller. The platen roller can accumulate adhesive on the outer edges of the roller. After using many rolls of media, these 'rings' of adhesive can get dislodged when using the printer. These particle clumps can then get transferred to other areas in the printer, most importantly, the printhead. To remove adhesive particles, use the adhesive side of a piece of linerless media to gently press and remove the particles from the platen roller. Use the Cleaning and Replacing the Platen on page 213 to get better access for particle removal. If the linerless media is sticking and binding in the printer, the silicon non-stick coating may have been used up. In this case, the linerless platen normally needs to be replaced. Linerless platen rollers come in two colors, reddish-brown (203 dpi) and brown (300 dpi).  CAUTION: Cleaning the roller with solutions or rubbing the delicate surface of this type of roller will permanently damage or shorten the usable life of the linerless platen.
Media path	Clean thoroughly as needed with fiber-free cleaning swabs and cloths moistened with 99% isopropyl alcohol. Let alcohol evaporate completely. See Cleaning the Media Path on page 204.
Interior	Clean as needed using a soft cloth, brush or compressed air to wipe or blow dust and particles out of the printer. Use 99% isopropyl alcohol and a fiber-free cleaning cloth to dissolve contaminants like oils and grime.

Component / Area	Recommendations
Exterior	Clean as needed using a soft cloth, brush, or compressed air to wipe or blow dust and particles out of the printer. The exterior of the printer can be cleaned using plain soap and water solutions to moisten the cloth. Only use the minimum amount of cleaning solution to avoid getting solution in the printer or other areas. Do NOT clean connectors or interior of the printer with this method. The latest healthcare printer models now include ultraviolet (UV) and disinfectant-ready plastics for hospital and other similar environments. The printer user interface controls are sealed so they can be cleaned with the rest of the printer's exterior. See the Guide To Disinfecting and Cleaning Zebra Healthcare Printers on the Zebra website at zebra.com/support for the latest information on tested and approved cleaning materials and cleaning methods.
Label dispenser option	Clean as needed to improve label dispenser operations. For details on operating the dispenser, see Cleaning the Label Dispenser Option on page 209.
Cutter option	The cutter is not a user-serviceable component. Do NOT clean inside the cutter opening or blade mechanism. Use the exterior cleaning procedure to clean the cutter bezel (housing). For cleaning and maintenance of this option, call a service technician.  CAUTION: There are no operator serviceable parts in the cutter unit. Never remove the cutter cover (bezel). Never attempt to insert objects or fingers in to the cutter mechanism.  IMPORTANT: The blade has a special coating to resist adhesives and wear. Cleaning it may ruin the blade.  IMPORTANT: Use the recommended cleaning supplies listed in this guide. Using unapproved tools, cotton swabs, solvents (including alcohol), etc. may damage or shorten the cutter's usable life or cause the cutter to bind.

Cleaning the Printhead

For optimal print operations, clean the printhead each time you load a new roll of media.

Always use a new cleaning pen on the printhead. Old, used cleaning pens carry contaminants from previous use that may damage the printhead.



CAUTION: The printhead becomes hot while printing. To protect from damaging the printhead and risk of personal injury, avoid touching the printhead. Only use the cleaning pen to perform printhead maintenance.

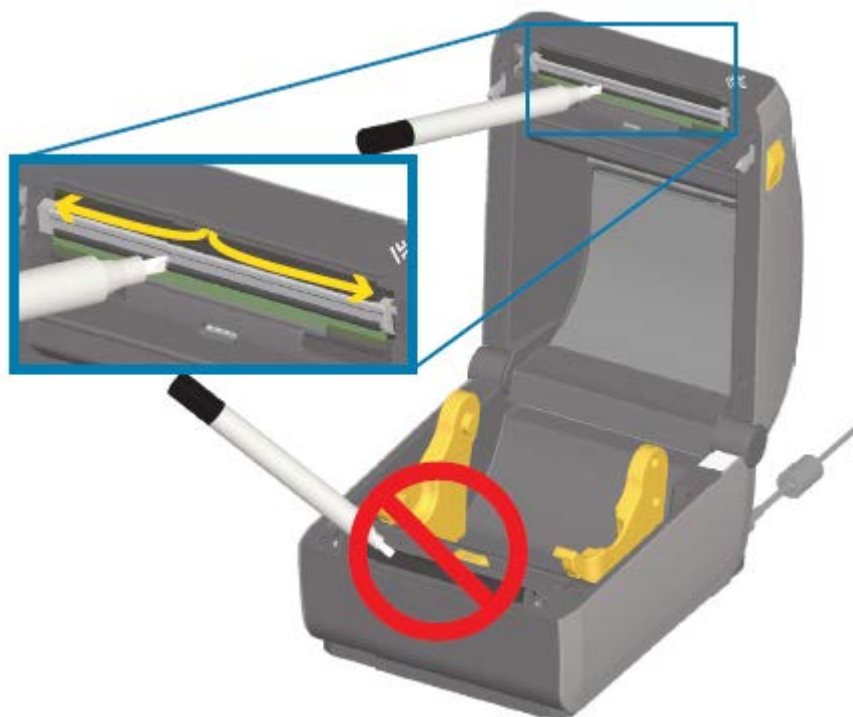


CAUTION—ESD: Observe static-safe procedures when working with the printhead or the electronic components under the top cover. The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead and other electronic components used in this device.

Cleaning the Printhead – ZD620 / ZD420 Direct Thermal Printers

Zebra recommends that you clean the printhead when you load a new roll of media.

1. Rub the cleaning pen across the dark area of the printhead. Clean from the middle to the outside.
2. Wait one minute before you close the printer to allow the wet areas to dry fully.

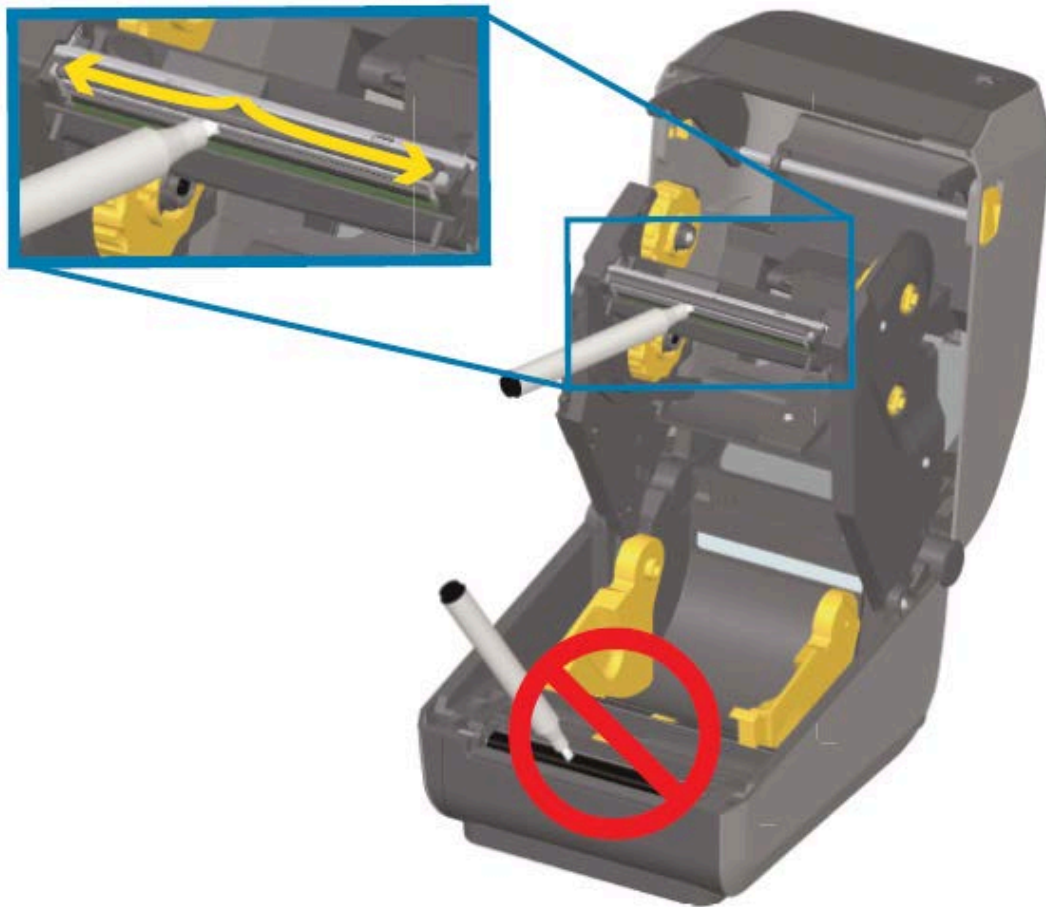


Cleaning the Printhead – ZD620 / ZD420 Thermal Transfer Printers

Zebra recommends that you clean the printhead when you load a new roll of media.

1. If transfer ribbon is installed, remove it before proceeding.
2. Rub the cleaning pen across the dark area of the printhead. Clean from the middle to the outside. This will move adhesive transferred from the edges of media to the outside of media path.

3. Wait one minute before closing the printer or loading ribbon to allow all components to dry.



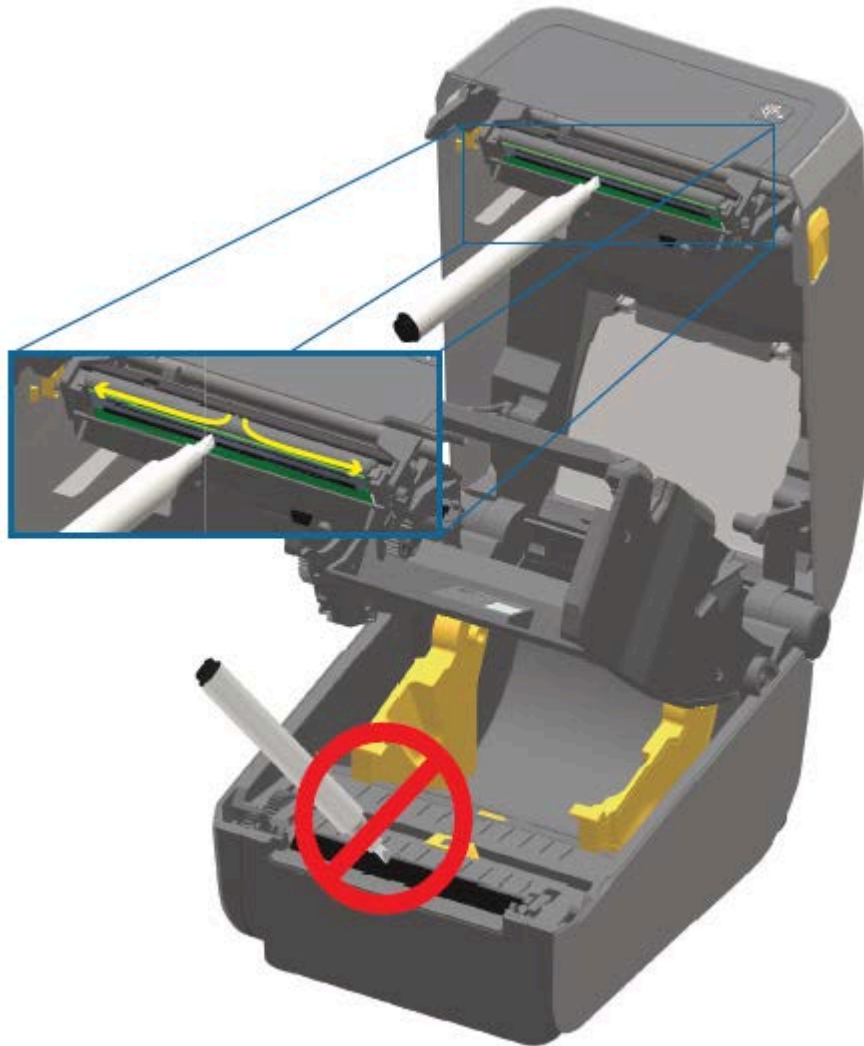
Cleaning the Printhead – ZD420 Ribbon Cartridge Printers

Zebra recommends that you clean the printhead when you load a new roll of media.

1. Pull the two release arms out to release the ribbon drive transport. See [Accessing the Printhead of the Ribbon Cartridge Printer](#) on page 29 for instructions on how to access the printhead.
2. Lift the printhead actuator arm up to access the printhead.
3. Rub the cleaning pen across the dark area of the printhead. Make sure you clean from the middle to the outside. This moves adhesive transferred from the outer edges of media away from and outside the media path.
4. Wait one minute for the surface of the printhead to dry.

5. Release the printhead actuator arm, then push the ribbon drive transport into the printhead actuator arm.

The release arms snap into place, relinking the ribbon drive transport to the top cover and the printhead actuator arm.



Cleaning the Media Path

Use a cleaning swab and or a lint-free cloth to remove debris, dust or crust that has built-up on the holders, guides, and the media path surfaces.

Lightly moisten the swab or cloth with 99% solution medical-grade alcohol. For hard to clean areas, use extra alcohol on a cleaning swab to soak the debris to break up any adhesive that may have accumulated on surfaces in the media compartment.



IMPORTANT: Do NOT clean the printhead, movable sensor, or platen as part of this process.

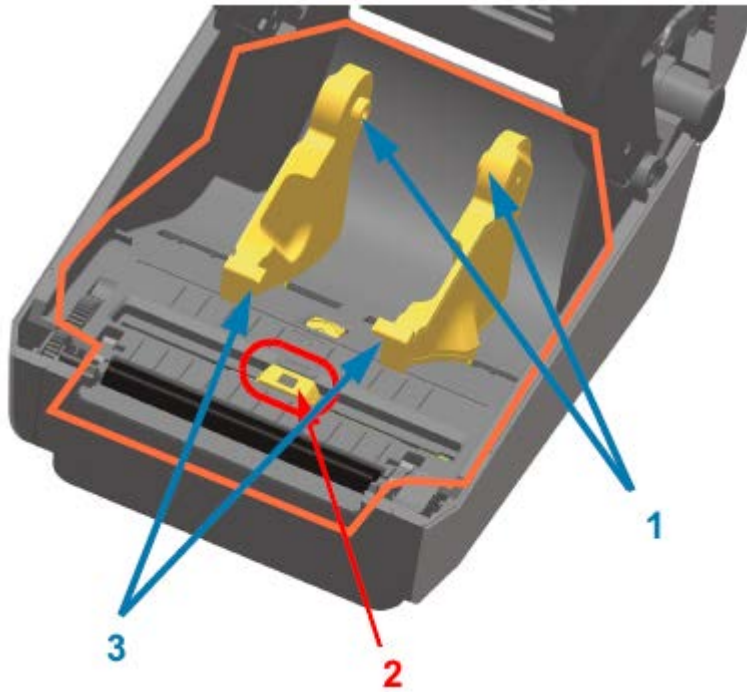
Cleaning the Media Path - Lower Half of All ZD620 / ZD420 Printers

The lower half of all the ZD620 / ZD420 printer models get cleaned the same way, as described in this procedure.



IMPORTANT: Do NOT clean the printhead, sensors, or platen as part of this process.

1. Wipe the inside surfaces of the roll holders and the underside of the media guides with a cleaning swabs lightly moistened with 99% pure isopropyl alcohol solution and wipes. Use extra alcohol if necessary to soak accumulated debris for removal.
2. Wipe the inside surfaces of the roll holders and the underside of the media guides with a swab.
3. Wipe the movable sensor slide channel (but not the sensor). Move the sensor gently as needed to get to all areas.
4. Wait one minute before closing the printer to allow time for all cleaned areas to dry thoroughly.



1	Media roll holders
2	Sensor (don't clean)
3	Media guides



NOTE: Use a clean swab for each cleaning. Discard all used cleaning swabs.

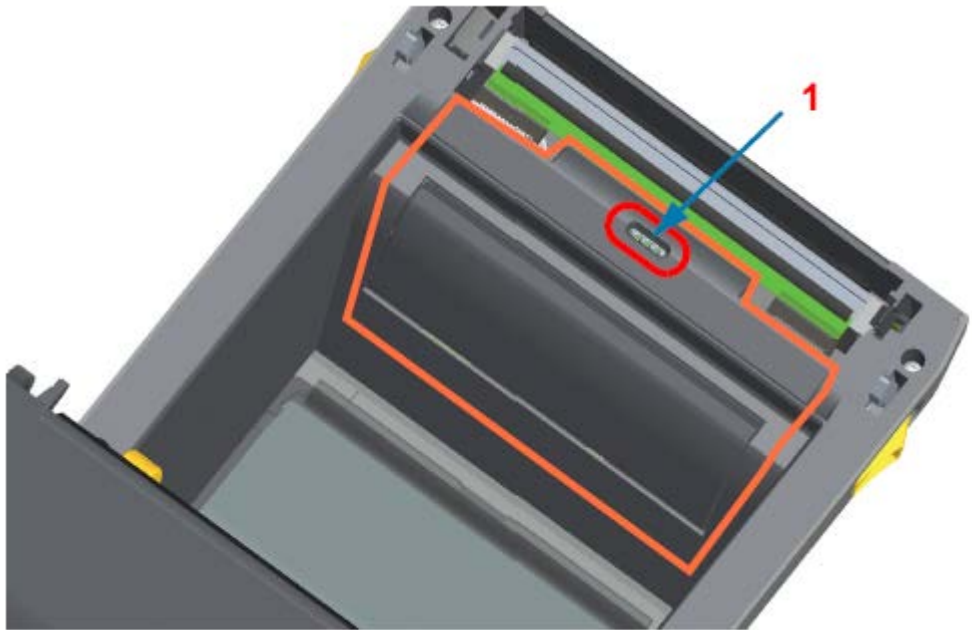
Cleaning the Media Path – Upper Half of ZD620 / ZD420 Direct Thermal Printers

See [Cleaning the Media Path](#) on page 204 for information on the cleaning solution and swabs or cloth to use to clean the media path.

Use a clean swab or lint-free cloth lightly moistened with 99% pure isopropyl alcohol to wipe the areas (outlined in orange in the figure below) to remove adhesive and other contaminants.



NOTE: Do NOT clean the sensor array.

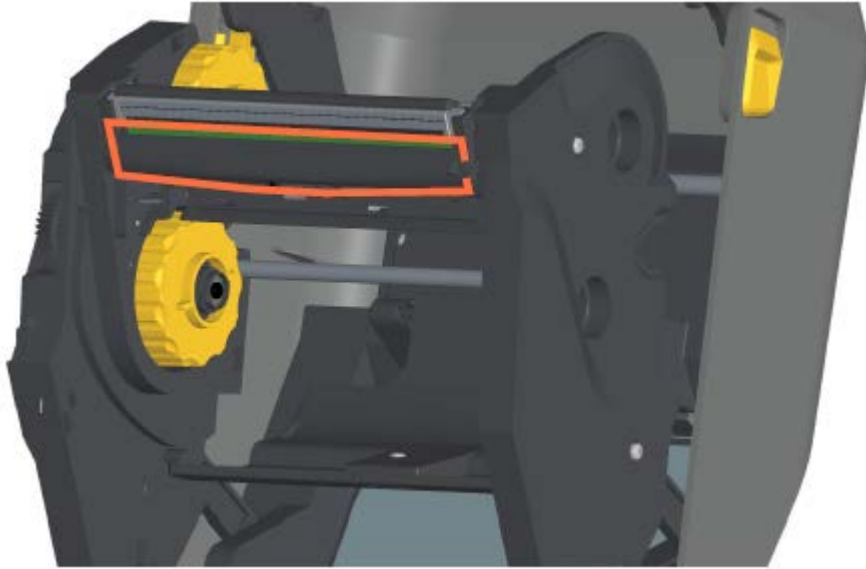


1	Sensor (do NOT clean)
---	-----------------------

Cleaning the Media Path – Upper Half of ZD620 / ZD420 Thermal Transfer Printers

See [Cleaning the Media Path](#) on page 204 for information on the cleaning solution and swabs or cloth to use to clean this path.

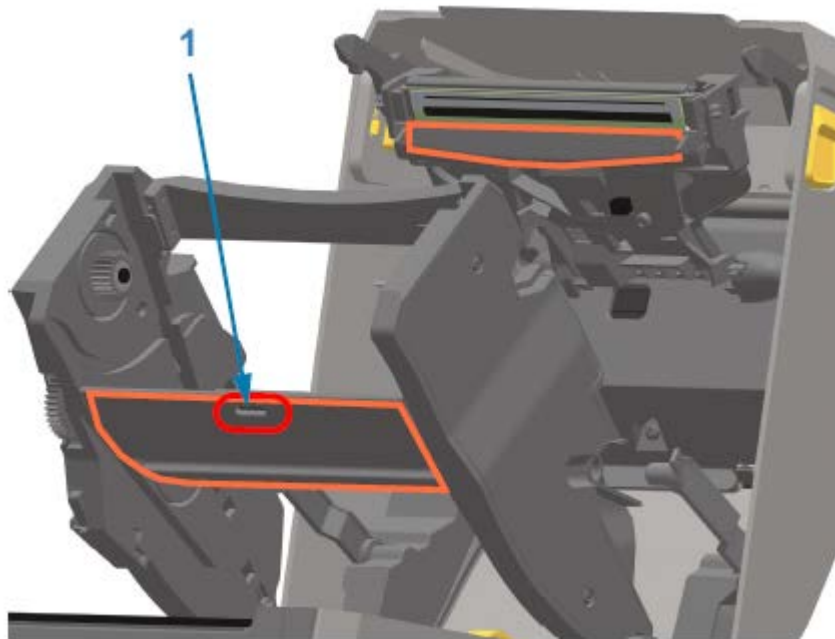
Use a clean swab or lint-free cloth lightly-moistened with 99% pure isopropyl alcohol solution to wipe the area (outlined in orange in the figure below), near the printhead on the front of the printer's ribbon carriage.



Cleaning the Media Path – Upper Half of ZD420 Thermal Transfer Ribbon Cartridge Printers

1. Pull the two release arms out to release the ribbon drive transport. See for instructions on how to access the printhead.
2. Wipe the areas (outlined in orange) which are below the printhead actuator arm and the ribbon drive transport.

3. Release the printhead actuator arm, then push the ribbon drive transport into the printhead actuator arm.



1	Sensor (do NOT clean)
---	-----------------------

The release arms snap into place, relinking the ribbon drive transport to the top cover and the printhead actuator arm.

Cleaning the Cutter Option



IMPORTANT: Clean only the plastic media path surfaces, and not the internal cutter blades or cutter mechanism. The cutter blade mechanism does NOT require maintenance cleaning. DO NOT clean the blade. This blade has a special coating to resist adhesives and wear which may be damaged if cleaned.



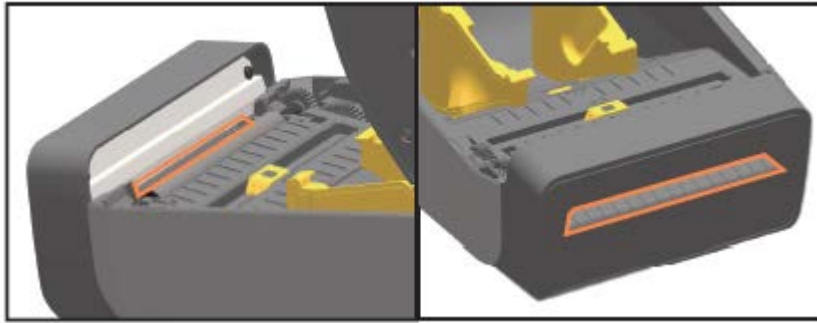
CAUTION: There are no operator serviceable parts in the cutter unit. Never remove the cutter cover (bezel), or attempt to insert objects or fingers into the cutter mechanism.



CAUTION: Using un-approved tools, cotton swabs, solvents (including alcohol), etc. all may damage or shorten the cutter's usable life or cause the cutter to jam.

1. Use a clean swab or lint-free cloth lightly-moistened with 99% isopropyl alcohol to wipe the ridges and the plastic surfaces of the media entry on the inside and the exit slot on the outside of the cutter. Clean inside the areas outlined in orange in the figure shown.

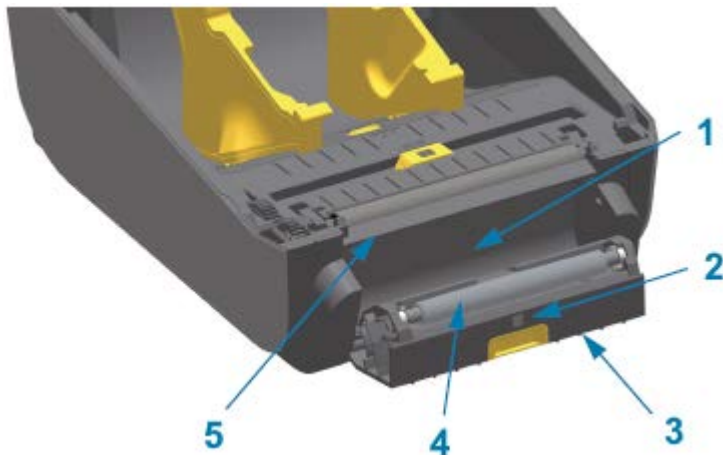
2. Repeat as necessary to remove any adhesive or contaminate residue and allow to dry.



Cleaning the Label Dispenser Option

For the cleaning supplies to use to clean the label dispenser, see [Cleaning Supplies](#) on page 199.

1. Open the door and clean the peel bar, the inner surfaces, and the ridges on the door using a clean swab or lint-free cloth lightly moistened with 99% pure isopropyl alcohol.
2. Rotate the roller and wipe its surfaces.
3. Discard the swab or cloth.
4. Use a new swab or cloth to remove any diluted residue.
5. Clean the sensor window thoroughly until it is clear of streaks and residue.



1	Inside wall
2	Label-taken sensor
3	Ridges
4	Pinch roller
5	Peel bar

Cleaning the Sensor

Dust can accumulate on the media sensors and must be cleaned periodically.

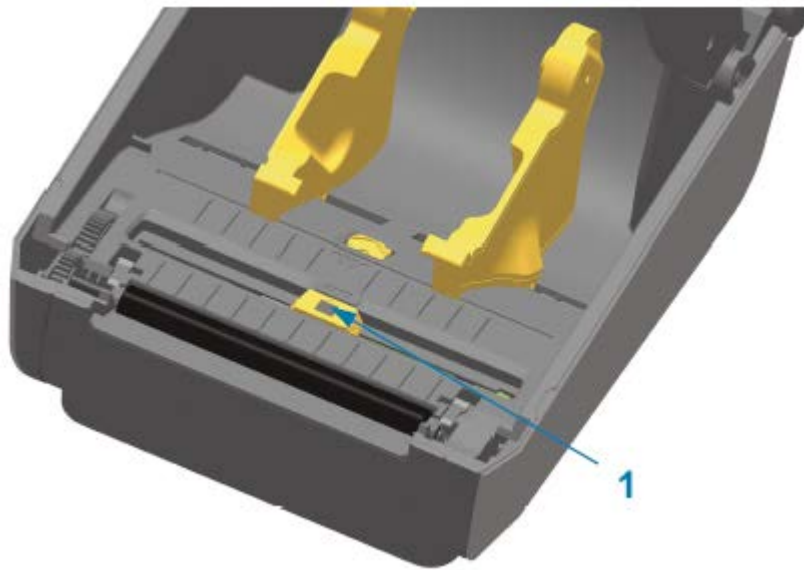


NOTE: Do NOT use an air compressor to remove dust. The action of air compressors tends to add moisture, fine grit, and lubricant which can contaminate your printer.

Cleaning the Sensor – Lower Half of the ZD620/ZD420 Printers

The lower half of all ZD620/ZD420 model printers are all cleaned the same way. Use this procedure to clean the sensor window.

1. Clean the window of the movable sensor by gently brushing away dust or using a can of compressed air. If necessary, use a dry swab to brush away dust.
2. If adhesives or other contaminants remain, use a swab moistened with 99% pure isopropyl alcohol to break them up. Discard the used swab(s).
3. Use a dry swab to remove any residue that may be left from the first cleaning.
4. Repeat the preceding steps as required until all residue and streaks are removed from the sensor.



1	Movable sensor (black mark and lower web/gap)
---	---

Cleaning the Sensor – Upper Half of ZD620/ZD420 Direct Thermal Printers

1. Spray the upper web (gap) array sensor below the printhead with a can of compressed air. If necessary, use a swab moistened with 99% pure isopropyl alcohol to break up adhesive or other non-dust contaminants.
2. Discard the used swab.

3. Use a clean dry swab to remove any residue that may be left from the first cleaning.

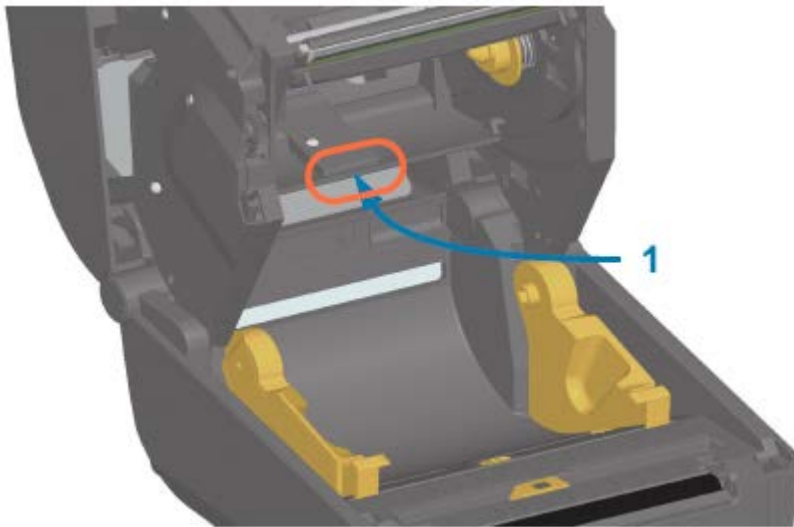


Cleaning the Sensor – Upper Half of the ZD620/ZD420 Thermal Transfer Printers

Use a can of compressed air to spray the upper web (gap) array sensor located below the printhead.



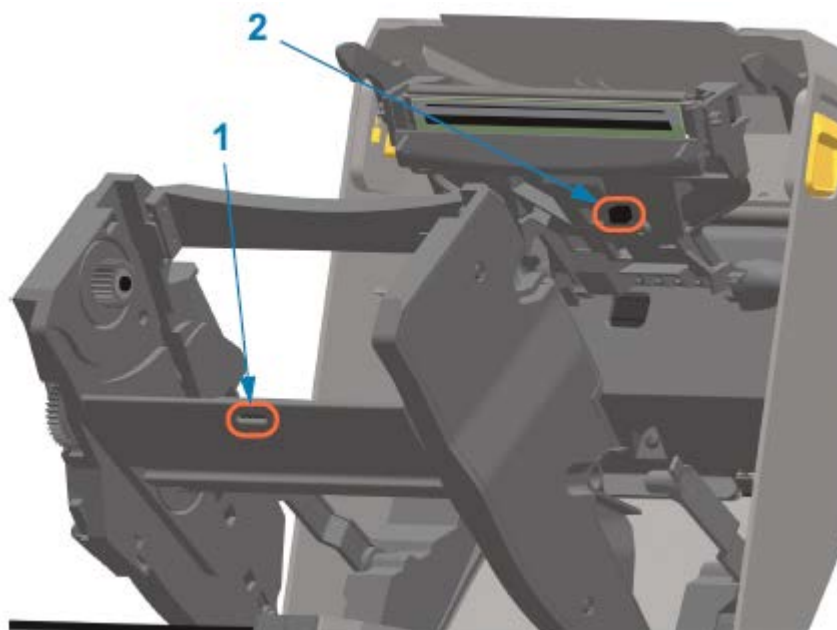
IMPORTANT: If the entire sensor needs a complete cleaning (which is a very rare occurrence), a service technician should perform the cleaning.



Cleaning the Sensor – Upper Half of the ZD420 Ribbon Cartridge Printers

1. Pull the two release arms out to release the ribbon drive transport. See [Accessing the Printhead of the Ribbon Cartridge Printer](#) on page 29 for instructions on how to access the printhead.
2. Swing the printhead actuator arm up until it touches the printer's top cover. Hold the actuator arm in this position for access to the area below the printhead.
3. Spray the upper web (gap) array sensor under the ribbon drive transport and the ribbon-out sensor on the underside of the printhead actuator arm with a can of compressed air. If necessary, use an alcohol-moistened swab to break up any accumulated debris.

4. Use a dry swab to remove any residue that may be left from the first cleaning.



1	Upper web (gap) array
2	Ribbon-out sensor

5. If the cartridges are not being detected, you may have to clean the ribbon cartridge sensor interface pins. Clean the pins using a clean swab or lint-free cloth lightly moistened with 99% pure isopropyl alcohol, using a gentle wiping motion from right to left.



IMPORTANT: Wipe gently, only left to right. Up and down motions may damage the pins.

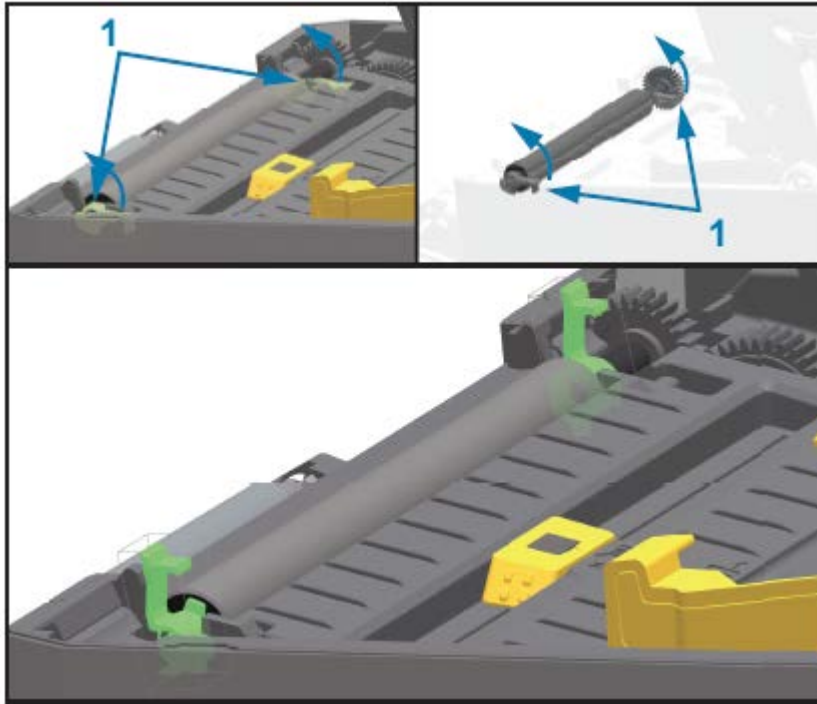


Cleaning and Replacing the Platen

The platen can be cleaned with a fiber and lint free swab (such as a Texpad swab) or a lint-free, clean, damp cloth very lightly moistened with medical-grade isopropyl alcohol (99% pure).

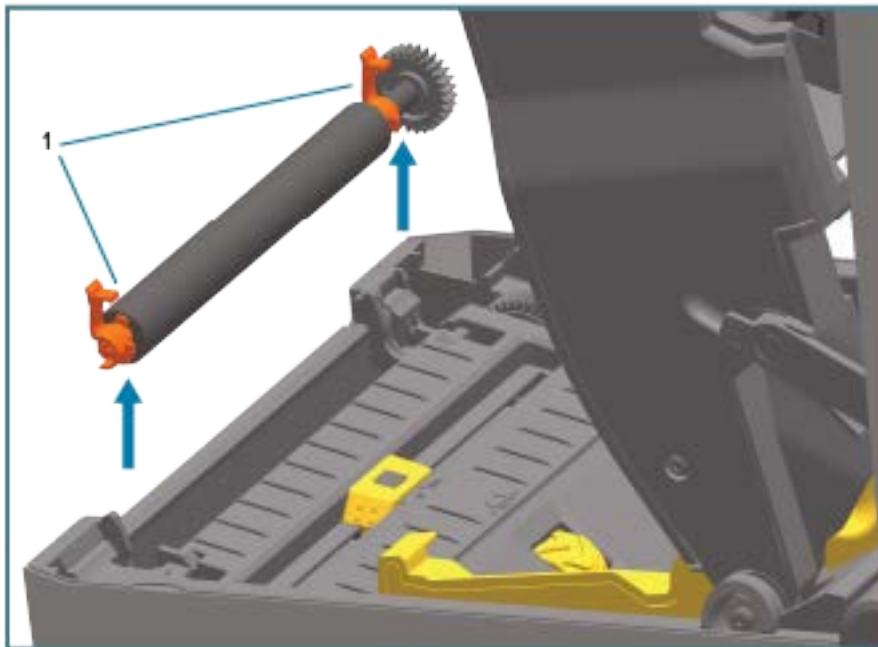
1. Open the cover (and if a label dispenser is installed, the dispenser door).
2. Remove media from platen area.

3. Pull the platen-bearing latch release tabs on the right and left sides towards the front of the printer and rotate them up.



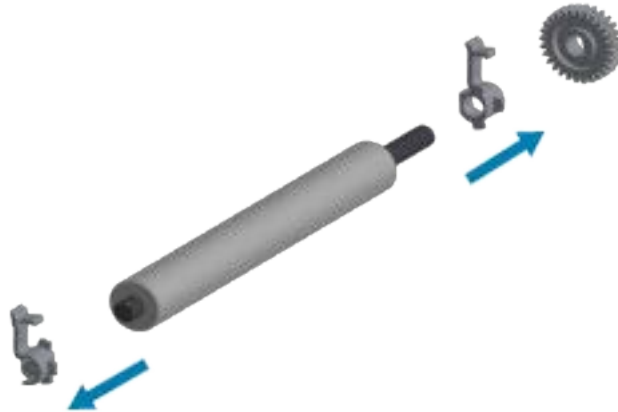
1	Platen bearings
---	-----------------

4. Lift the platen out of the printer's bottom frame.



1	Platen bearings
---	-----------------

5. Slide the gear and the two bearings off the shaft of the platen roller.

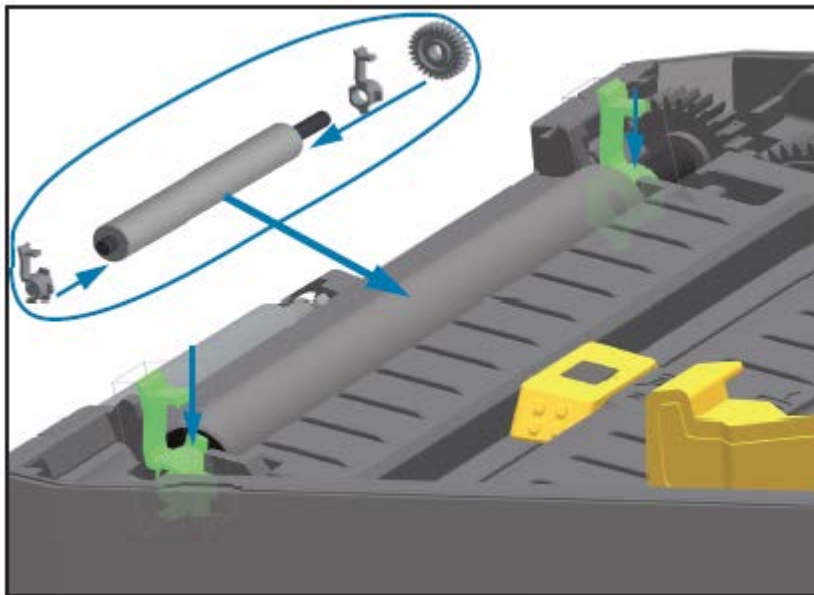


6. To clean the platen, use alcohol moistened swab or lint-free cloth very lightly moistened with medical-grade isopropyl alcohol (99% pure).. Clean from the center out. Discard the used swab or cloth. Repeat this process until all of the roller surface has been cleaned. If there has been heavy adhesive build-up or label jam, repeat with a new swab to remove residual contaminants. Adhesives and oils, for example, may be thinned by the initial cleaning but not completely removed.



IMPORTANT: To clean lineless platen, use **ONLY** the adhesive side of a piece of linerless media to gently lift the particles from the platen roller.

7. Make sure the bearings and drive gear are on the shaft of the platen roller.



8. Align the platen with the gear to the left and lower it into the printer's bottom frame.
9. Rotate the platen bearing latch release tabs down on the right and left sides towards the rear of the printer and snap them into place.
10. Allow the printer to dry for one minute before closing the dispenser door, media cover, or loading labels.

Replacing the Printhead

Review these printhead removal and installation steps before you proceed to replace the printhead.



CAUTION: Prepare your work area by protecting against static discharge. Your work area must be static-safe and include a properly grounded conductive cushioned mat to hold the printer and a conductive wrist strap for yourself.



CAUTION: Unplug the printer from the power supply and allow the printer to cool to prevent injuries or damage to printer circuitry.

Replacing the Printhead – ZD620 and ZD420 Direct Thermal Printer Models

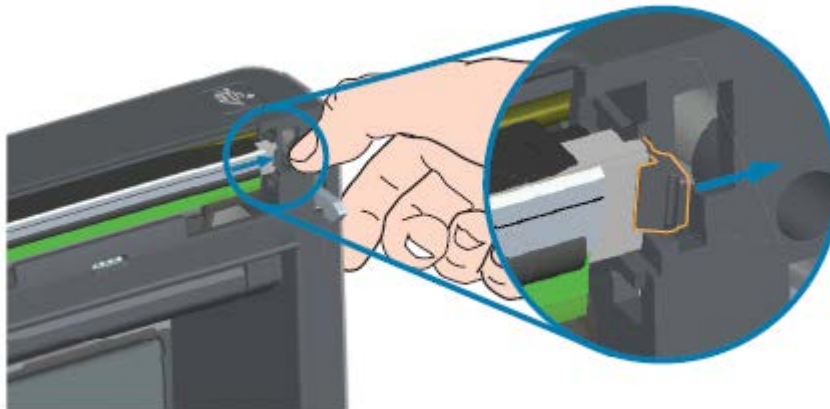
1. Use these steps to remove the printhead:

- a) Turn printer power OFF.
- b) Open the printer.



1	Printhead
---	-----------

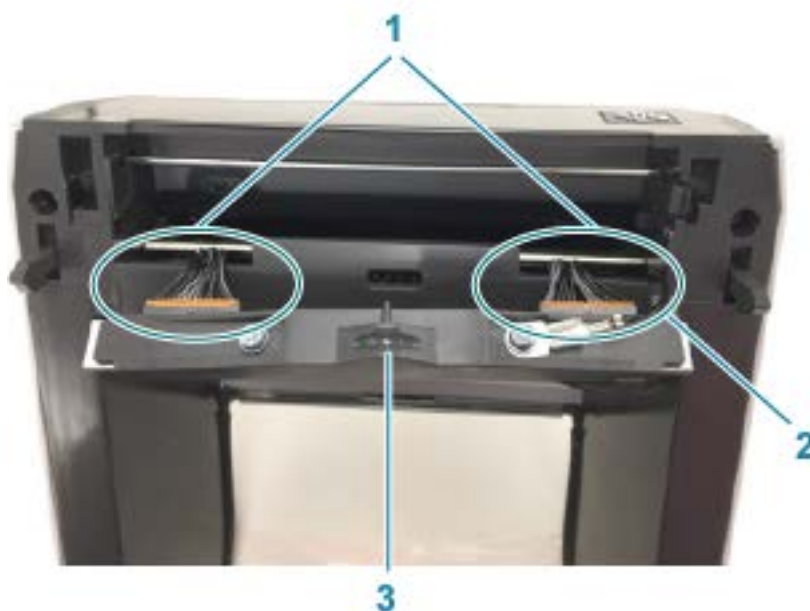
c) Push the printhead release latch away from the printhead. The right side of printhead releases.



- d) Swing the loose, right side of the printhead out of the printer. Pull it out and to the right a little to get the left side of the printhead clear.
- e) Pull the printhead out and free of the top cover to gain access to its attached cables on the backside of the printhead. In the figure that follows, the red outline indicates the printhead retainer slot which is on the left side as you face the open printer.



- f) Gently but firmly pull the two printhead cable bundle connectors off the printhead. Then pull the ground wire off the printhead.



1	Connectors
2	Printhead ground wire
3	Printhead assembly

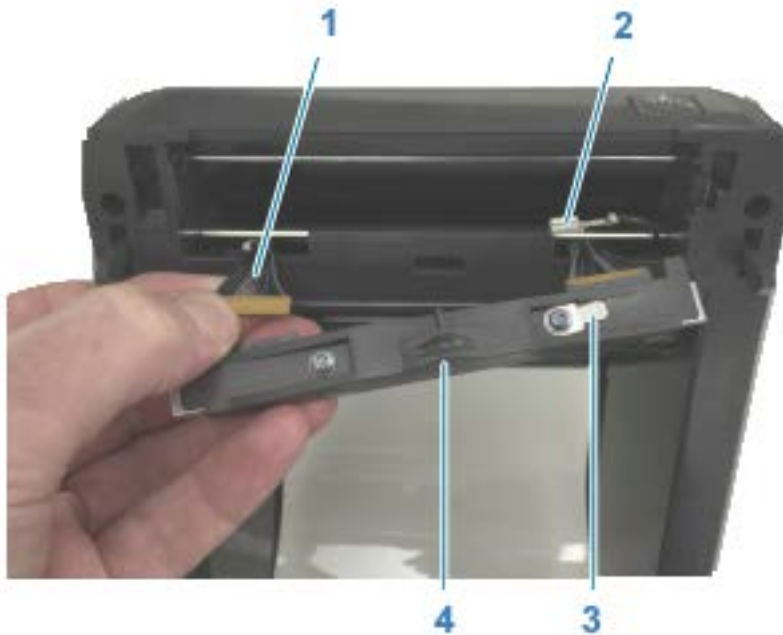
2. Replace the printhead using these steps:

- a) Push the right side printhead cable connector into the printhead.



NOTE: The connector is keyed to only insert one way.

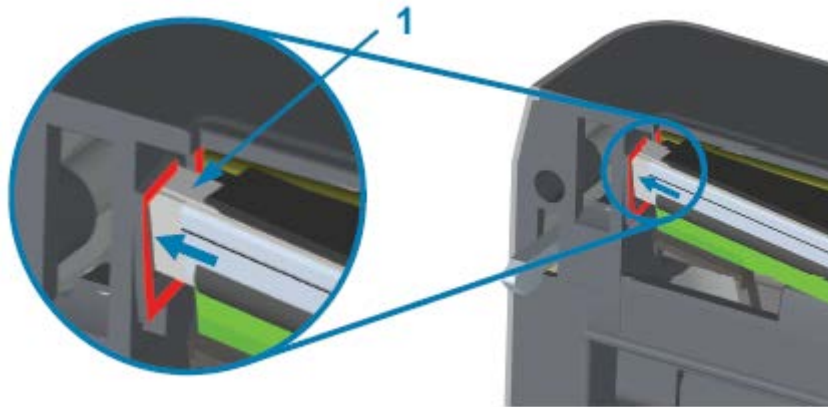
- b) Attach the ground wire to the printhead's ground tab.
- c) Push the left side printhead cable connector onto the printhead.



1	Connector with key
2	Printhead ground wire
3	Printhead ground tab

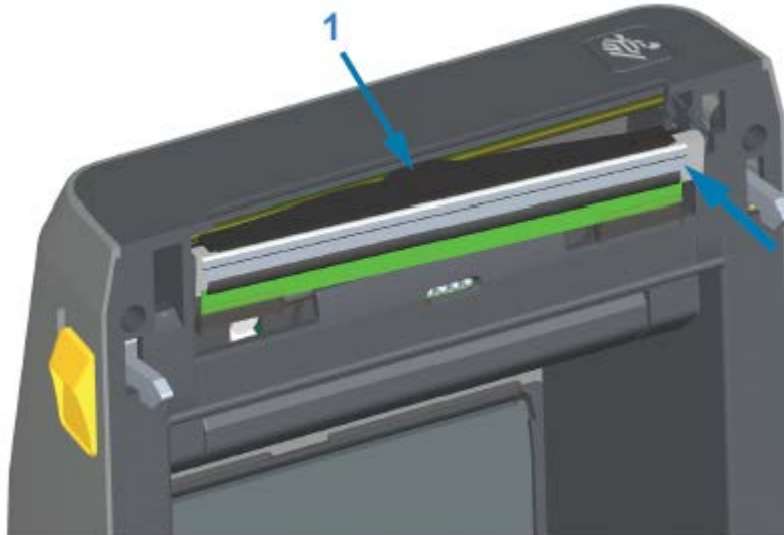
4	Spring wire notch
---	-------------------

- d) Insert the left side of the printhead assembly into the recessed slot (highlighted in red) on the left side of the printer.



1	Slot
---	------

- e) Align the spring wire notch on the backside of the printhead to the spring wire. Push the right side of the printhead into the printer until the latch locks the right side of the printhead into the printer.



1	Spring wire in notch
---	----------------------

- f) Verify that the printhead moves up and down freely when pressure is applied and remains locked when released.



- g)** Clean the printhead. Use a new pen to wipe body oils (finger prints) and debris of the printhead. Clean from the center of the printhead to the outside. See [Cleaning the Printhead](#) on page 201.
- 3.** Reload media, plug in the power cord (if removed), turn printer power ON, and print a status report to ensure proper function. See [Test Printing with the Configuration Report](#) on page 131.

Replacing the Printhead – ZD620 and ZD420 Thermal Transfer Ribbon Roll Printer Models

1. Use these steps to remove the printhead:
 - a) Turn printer power OFF and open the printer.



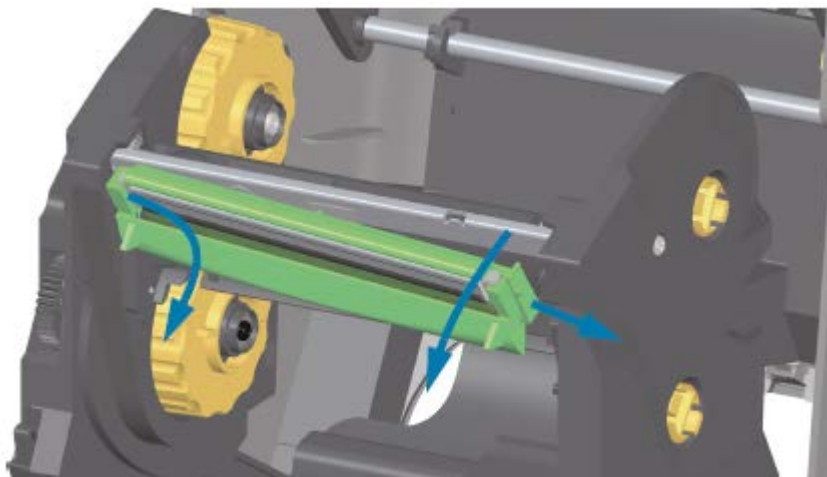
1	Printhead
---	-----------

- b) Push the printhead release latch toward the printhead (shown in green for visibility in the following figure).

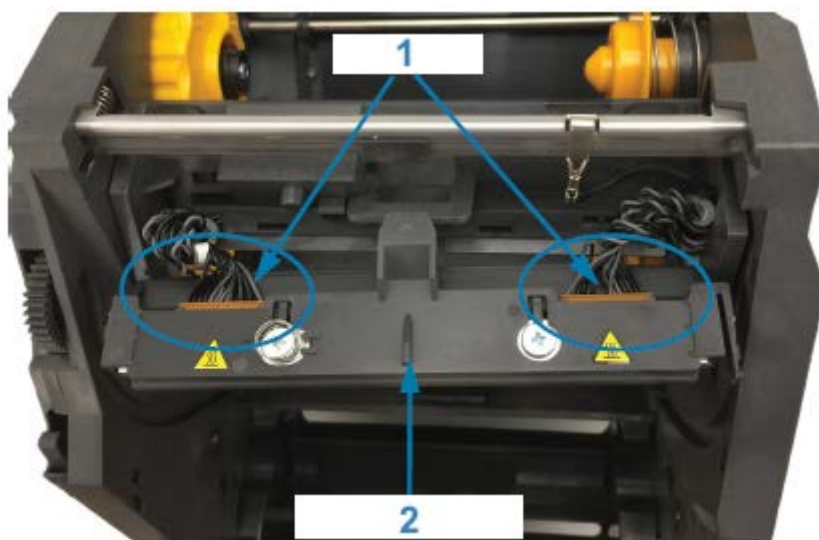


The right side printhead releases down and away from the printhead actuator arm.

- c) Swing the loose right side of the printhead out of the printer. Pull it to the right a little to get the left side of the printhead clear. Pull the printhead down and free of the ribbon carriage to gain access to its attached cables.



d) Gently but firmly pull the two printhead cable bundle connectors off of the printhead.



1	Connectors
2	Printhead assembly

2. Follow these steps to replace the printhead:

a) Push the right side printhead cable connector into the printhead.

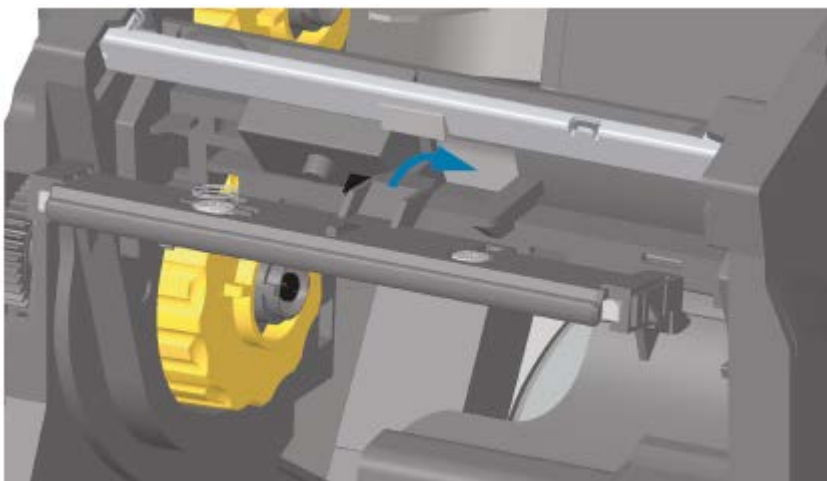


NOTE: The connector is keyed to only insert one way.

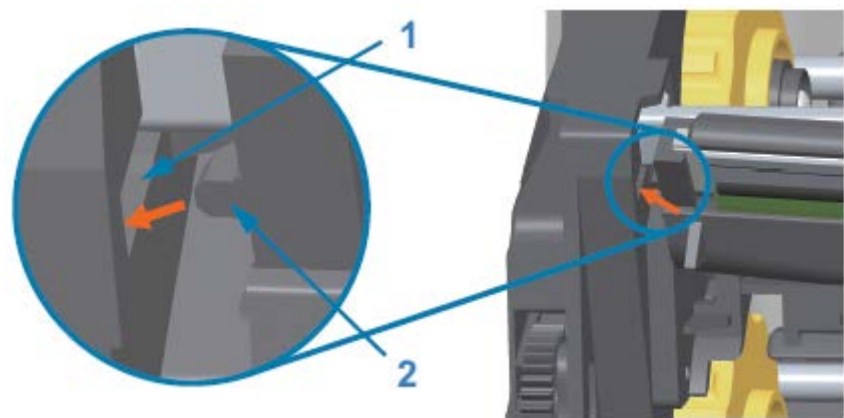
b) Push the left side printhead cable connector onto the printhead.



c) Insert the center tab on the printhead assembly into the center slot on the printhead actuator arm.



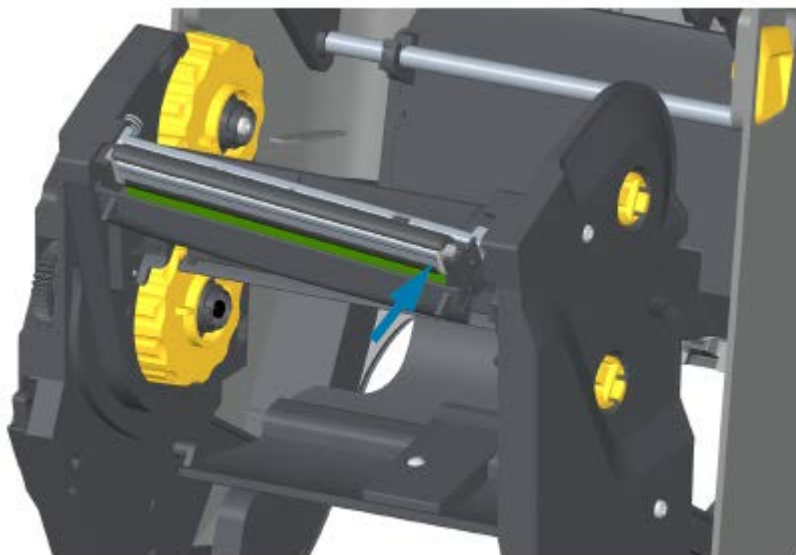
d) Insert the left side tab of the printhead assembly into the recessed slot on the left side of the printhead actuator arm.



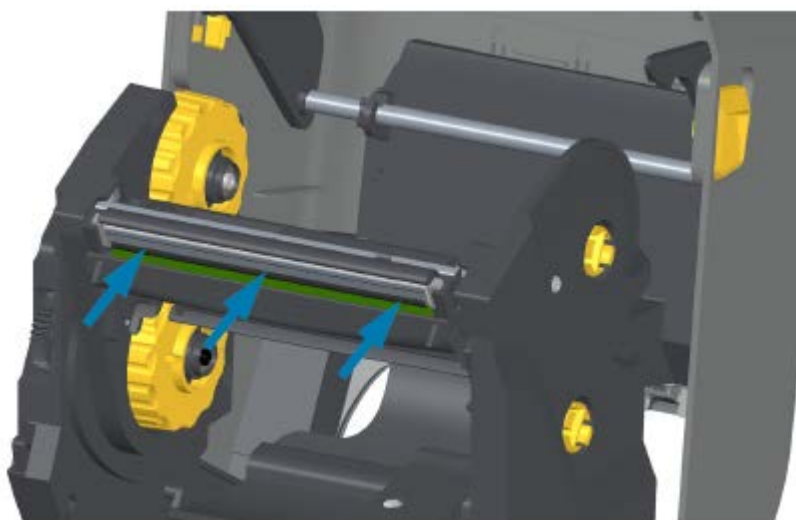
1	Slot
---	------

2	Tab
---	-----

- e) Push the right side of the printhead into the printer until the latch locks the right side of the printhead into the printer.



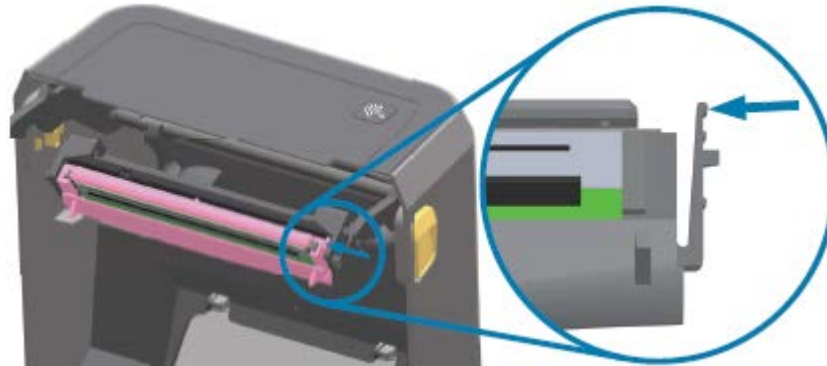
- f) Verify that the printhead moves up and down freely when pressure is applied and remains locked when released.



- g) Clean the printhead. Use a new pen to wipe body oils (fingerprints) and debris of the printhead. Clean from the center of the printhead to the outside to avoid damaging the printhead. See [Cleaning the Printhead](#) on page 201.
- h) Reload media. Plug in the power cord, turn on the printer and print a status report to ensure proper function. See [Test Printing with the Configuration Report](#) on page 131.

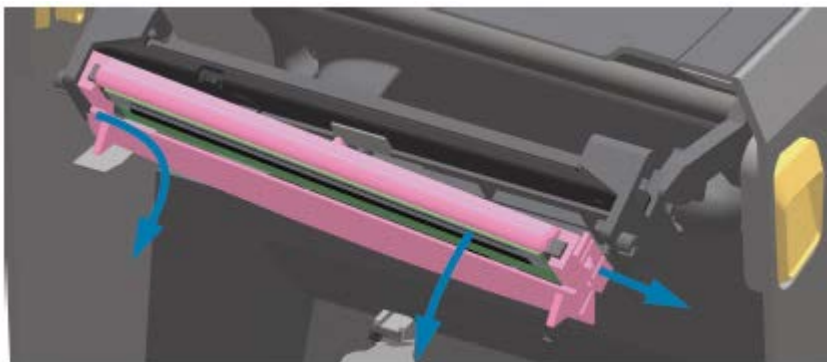
Replacing the Printhead – ZD420 Thermal Transfer Ribbon Cartridge Printer Models

1. To remove the printhead, follow these steps:
 - a) Turn printer power OFF and open the printer.
 - b) Pull the two release arms out to release the ribbon drive transport. See [Accessing the Printhead of the Ribbon Cartridge Printer](#) on page 29.
 - c) Swing the printhead actuator arm up until it touches the printer's top cover. Hold the printhead actuator arm in this position for access to the printhead. Push the printhead release latch toward the printhead (shown as pink for visibility in the image that follows).

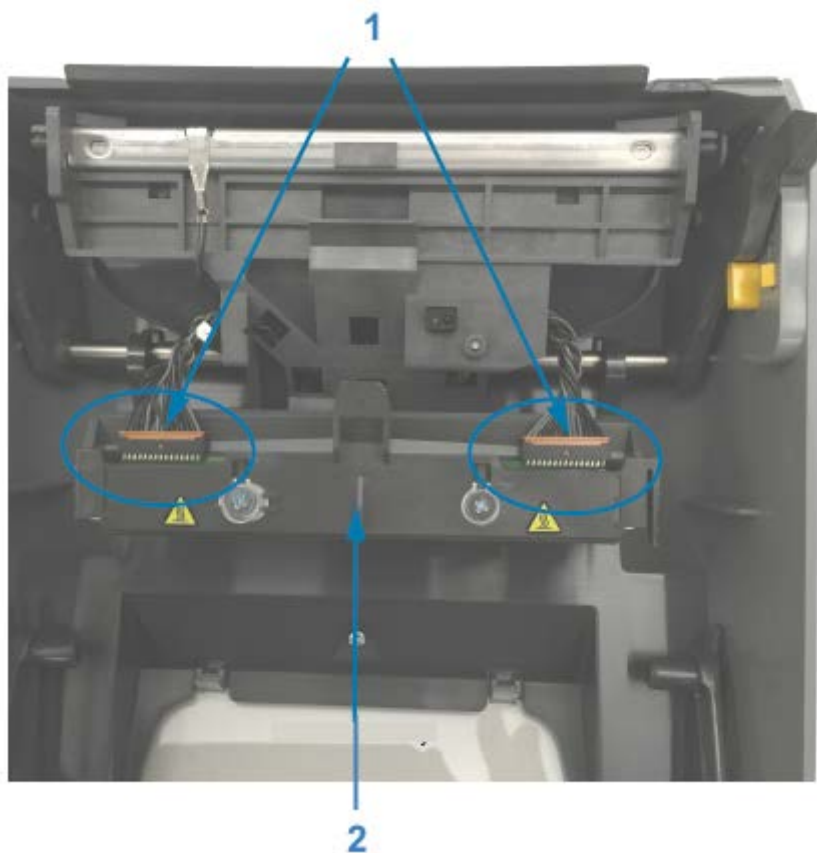


The right side printhead releases down and away from the printhead actuator arm.

- d) Swing the loose right side of the printhead out of the printer. Pull it to the right a little to get the left side of the printhead clear. Pull the printhead down and free of the printhead actuator arm to gain access to its attached cables.



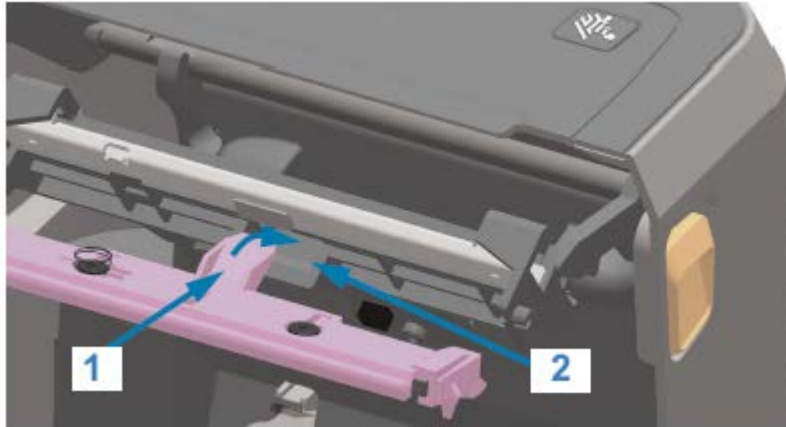
- e) Gently but firmly pull the two printhead cable bundle connectors off of the printhead.



1	Connectors
2	Printhead assembly

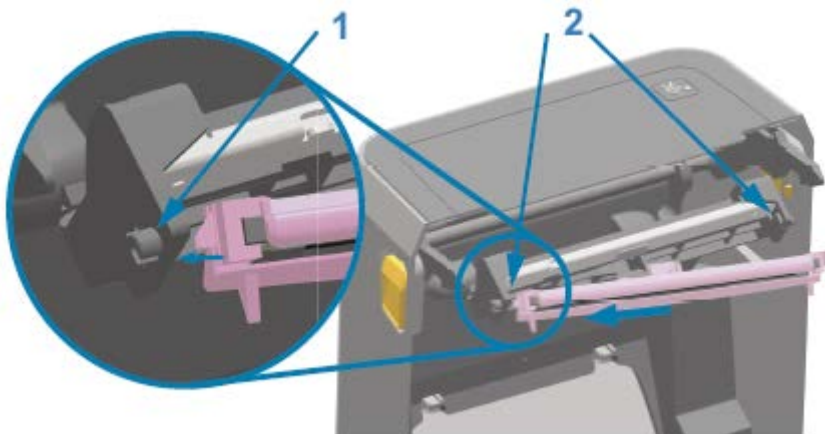
2. Follow these steps to replace the printhead:

- a) Push the right side printhead cable connector into the printhead. The connector is keyed to only insert one way.
- b) Push the left side printhead cable connector onto the printhead.
- c) Insert the center tab on the printhead assembly into the center slot on the printhead actuator arm.



1	Tab
2	Slot

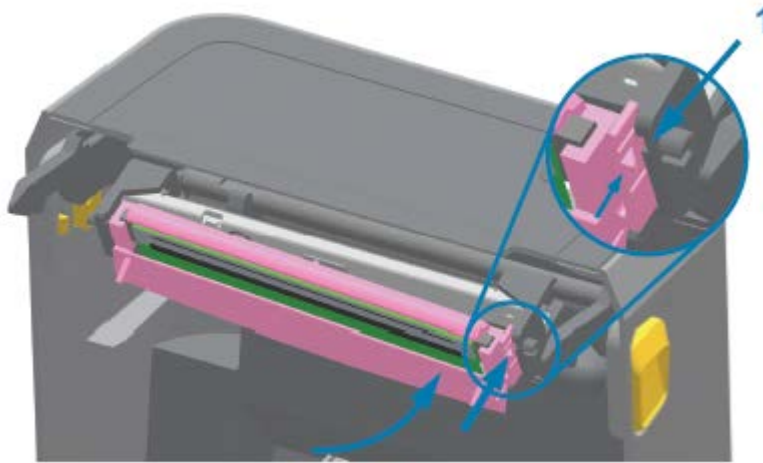
- d) Insert the left side tab of the printhead assembly into the recessed slot on the left side of the printhead actuator arm.



1	Tab
---	-----

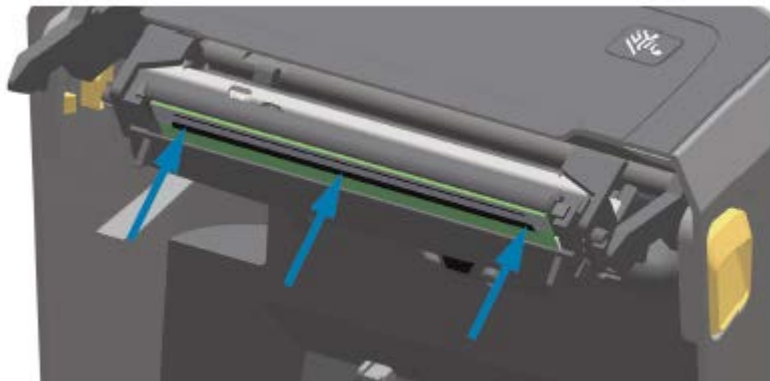
2	Slot - both sides
---	-------------------

- e) Push the right side of the printhead into the printer until the latch locks the right side of the printhead into the printer.



1	Slot guide
---	------------

- f) Verify that the printhead moves freely into the printer when pressure is applied (see arrow) and remains locked when pressure is released.



- g) Clean the printhead by using a new cleaning pen to wipe body oils (finger prints) and debris off the printhead. See [Cleaning the Printhead](#) on page 201.
- h) Reload media. Turn on the printer and print a status report to ensure proper function. See [Test Printing with the Configuration Report](#) on page 131.

Updating Printer Firmware

Zebra recommends that you periodically update the printer with the latest firmware to get new features, improvements, and printer upgrades for media handling and communications.

Download the firmware from the appropriate printer support page link listed in [About this Guide](#) on page 11.

Use Zebra Setup Utilities (ZSU) to load new firmware.

1. Open Zebra Setup Utilities.

2. Select your printer.

3. Click **Open Printer Tools**.

The Tools window opens.

4. Click the **Action** tab.

5. Load the printer with media. See [Loading Media](#) on page 111.

6. Click **Send file**.

The lower half of the window displays a filename and path.

7. Click **Browse (...)** and select the latest firmware file you downloaded from the Zebra web site.

8. Observe the user interface and wait.

If the firmware version of the transferred file differs from the version installed on the printer, the firmware will download to the printer. The data indicator flashes green as firmware downloads. The printer restarts with all indicators flashing. When the firmware update is complete, the STATUS indicator turns solid green during firmware validation and installation. The printer prints a printer configuration report.

The firmware update is complete.

Other Printer Maintenance

There are no user-level maintenance procedures beyond those detailed in this section.

Fuses

There are no replaceable fuses in the ZD Series printers or power supplies.

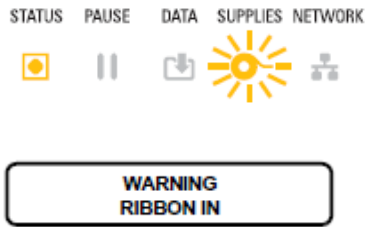
Troubleshooting

This section provides troubleshooting procedures and information.

Resolve Alerts and Errors

Alert	Possible Cause(s) and Remedies
Printhead Open The cover is open or it has not been closed properly, either after a print command was issued or after FEED () was pressed.      HEAD OPEN CLOSE HEAD	The cover is open or not properly closed. Close the cover / printhead. Push down on the front top corners of the printer's cover until you hear and feel the cover latches snap in place. The printer's Head-Open switch needs service. Call a service technician for assistance.
Media Out The printer cannot detect media in the print path after a print command has been issued or after FEED () was pressed.      MEDIA OUT LOAD MEDIA	There is no media (roll) in the printer. Load media and close the printer cover. You may need to press FEED () one time or press PAUSE to resume a print operation that was in progress before the printer ran out of media. See Loading Media on page 111. A label is missing between two labels at the end of the loaded roll. Roll manufacturers use this method to identify the end of a roll. See Detecting a Media-Out Condition on page 132. Replace the empty media roll and continue printing.  NOTE: To avoid losing a print job that is in progress, do NOT switch printer power OFF to load the media. See Detecting a Media-Out Condition on page 132.

Alert	Possible Cause(s) and Remedies
	The media sensor is misaligned. Check the position of the media sensor. See Adjusting the Movable Sensor for Black Marks or Notches on page 115.  NOTE: You may have to calibrate the printer for the newly-loaded media after you adjust the sensor location. See Running a SmartCal Media Calibration on page 130.
	The printer is set for non-continuous (labels or black mark) media, but continuous media is loaded. Check that the media sensor is positioned in the center default location. See Adjusting the Movable Sensor for Web (Gap) Sensing on page 115. The printer may need to be calibrated for the media after you adjust the sensor location. See Running a SmartCal Media Calibration on page 130.
	The media sensor is dirty. Clean the upper web/gap sensor array and the lower movable media sensors. See Cleaning the Sensor on page 209. Reload media, adjust the movable media sensor's position for your media, and recalibrate the printer for the media. See Loading Media on page 111 and Running a SmartCal Media Calibration on page 130.
	Media sensing is not working as it should for printing, possibly due to data corruption of memory or faulty components. Reload the printer's firmware. See Updating Printer Firmware on page 230. If this does not fix this issue, call a service technician.

Alert	Possible Cause(s) and Remedies
Ribbon In (ZD420 Cartridge Printer only) A print command has been sent to the printer and it is in Direct Thermal Mode with Ribbon installed. The printer has two heat settings: one for Direct Thermal print mode and one for Thermal Transfer print mode. These modes are designed to render equivalent print density / darkness at the same setting level. 	There is a Ribbon Cartridge in the printer while the printer is set to Direct Thermal Mode (and printing on direct thermal media). Remove the ribbon cartridge from the printer without turning printer power OFF, then close the printer. You may need to press FEED one time or press PAUSE to get the printer to resume your print operation. The printer is incorrectly set to Direct Thermal Mode when you are trying to print using Transfer Media and Ribbon Cartridge to print. The print format/form sent for this print job may have Direct Thermal mode set with a ^MTD set instead of ^MTT. You can change the PRINT METHOD in one of three ways: • Change the PRINT METHOD to THERMAL TRANS (Thermal Transfer) using ZPL Programming. See the ZPL Programming Guide for details on printer programming. For links to this and other manuals, see the About this Guide on page 11. • Access the Settings menu using the printer's display (if present) to change the setting. See PRINT METHOD in Settings Menu on page 71. • Use an Ethernet (LAN or WLAN) printer's Print Server Web page to access and set the PRINT METHOD to THERMAL TRANS (Thermal Transfer). See PRINT METHOD in Settings Menu on page 71 for details.

Alert	Possible Cause(s) and Remedies
Ribbon Out The printer stops while it is printing, or it displays this alert immediately after a print job has been sent to the printer. STATUS PAUSE DATA SUPPLIES NETWORK      ALERT RIBBON OUT	The printer has detected the end of the ribbon. The end of the ribbon has a reflective trailer on the end of Genuine Zebra Transfer Ribbon that the printer ‘sees’ as End of Ribbon. Remove the ribbon and replace the ribbon rolls or rib, then close the printer. You may need to press FEED one time or press PAUSE to get the printer to resume your print operation. See Detecting a Ribbon-Out Condition on page 133. For ZD420 Cartridge Printers only: A ribbon cartridge needs to be loaded in the printer. The printer is set for Thermal Transfer Mode. See Loading the ZD420 Ribbon Cartridge on page 129. For ZD420 Cartridge Printers only: The printer is unable to sense media possibly because: • The ribbon cartridge data chip or cartridge sensor contacts is dirty. • Data in memory is corrupted. • The cartridge or printer components is faulty. Try these: • Install another working ribbon cartridge (if available). • Clean the ribbon cartridge chip with an alcohol-moistened swab. • Clean the ribbon cartridge sensor’s contact pins. See Cleaning the Sensor – Upper Half of the ZD420 Ribbon Cartridge Printers on page 211 for cleaning instructions. • Reload the printer’s firmware. See Updating Printer Firmware on page 230. If these do not fix this issue, call a service technician. For Standard Roll (Thermal Transfer printers): The printer is unable to sense media due to other issues. Reload the printer’s firmware. See Updating Printer Firmware on page 230. If this does not fix this issue, call a service technician.
Ribbon Low (ZD420 Cartridge Printer only) STATUS PAUSE DATA SUPPLIES NETWORK      ALERT RIBBON LOW	The printer has calculated that the ribbon cartridge has only 10% of the ribbon left in the cartridge. The ribbon low value can be changed using programming commands. Check for the availability of ribbon cartridges. For information on changing the Ribbon Low warning point, see Ribbon Cartridge Programming Commands on page 181. See also the ZPL Programming Guide for details on printer programming. For links to this and other manuals, see the About this Guide on page 11.

Alert	Possible Cause(s) and Remedies
Cut Error The cutter blade is bound and is not moving properly.      ERROR CONDITION CUT ERROR	Media, adhesive, or an foreign object has stopped the cutter blade from operating. Turn printer power OFF by holding POWER down for five seconds. Wait for the printer to shutdown completely, then turn printer power ON. If the printer does not recover from this error, call a service technician for assistance.  CAUTION: There are no operator serviceable parts in the cutter unit. Never remove the cutter cover (bezel). Never attempt to insert objects or fingers in to the cutter mechanism.  NOTE: Using unapproved tools, cotton swabs, solvents (including alcohol), etc. may damage or shorten the cutter's usable life or cause the cutter to jam.
The printhead is over temperature and paused to allow the printhead to cool.      PRINthead OVER TEMP PRINTING HALTED	The printer is printing a large batch job, typically with large amounts of print. The print operation will resume after the printhead has cooled.
The printhead is below operating temperature for proper printing.     PRINthead SHUTDOWN PRINTING HALTED	The printhead has had a critical temperature or power failure. Turn printer power OFF by holding POWER down for five seconds. Wait for the printer to shutdown completely, then turn printer power ON. If the printer does not recover from this error, call a service technician. The printhead is not a operator-serviceable item.
The printhead is below operating temperature for proper printing.      PRINthead UNDER TEMP PRINTING HALTED THERMISTOR REPLACE PRINthead	The ambient temperature at the printer's location is below the specified operating range. Turn printer power OFF, then move the printer to a warmer location and wait for it to warm naturally. Moisture may condense in and on the printer if the temperature changes too quickly. The printhead thermistor has failed. Turn printer power OFF by holding POWER down for five seconds. Wait for the printer to shutdown completely and turn printer power ON. If the printer does not recover from this error, call a service technician.

Alert	Possible Cause(s) and Remedies
Cannot store data in the printer in the specified memory location. There are four types of storage memory: graphic, format, bitmap, and font.  OUT OF MEMORY STORING GRAPHIC OUT OF MEMORY STORING FORMAT OUT OF MEMORY STORING BITMAP OUT OF MEMORY STORING FONT	There is not enough memory to perform the function specified on the second line of the error message. - Free up some of the printer's memory by adjusting the label format or printer parameters to make the print area smaller. - Remove unused graphics, fonts, or formats. - Ensure that the data is not directed to a device that is not installed or is unavailable.

Resolve Print Issues

Use this information to identify issues with printing or print quality, the possible causes, and the recommended solutions.

Issue	Possible Cause(s) and Remedies
The printed image does not look right.	The printer may be set at an incorrect darkness level and/or print speed. Perform the Print Quality test (FEED self-test) to determine the ideal darkness and speed settings for your application. Be sure NOT to set print speeds above the manufacturer's maximum rated speed for your print media. See Printing a Print Quality Report on page 247 and Adjusting Print Quality on page 173.
	The printhead may be dirty. Clean the printhead. See Cleaning the Printhead on page 201.
	The platen roller is dirty or damaged. Clean or replace the platen. See Cleaning and Replacing the Platen on page 213.
	The printhead has worn out or is damaged. Replace the printhead. See Replacing the Printhead on page 216.

Issue	Possible Cause(s) and Remedies
	With Thermal Transfer printing, the print looks fuzzy, has smudge marks, or has voids or holes in print with no particular pattern. The print material (wax, wax-resin, or resin) may not match the material (paper, media coating, or synthetics) in use. Set the printer for no higher than the maximum recommended print speed of the ribbon cartridge. See Ribbon Cartridge Programming Commands on page 181 for reading cartridge features.
	The wrong power supply may be in use. Verify you are using the power supply that came with this printer.
No print on the label.	The media may not be direct thermal media (and is thermal media, made for thermal transfer printers). Load the right media for your printer type. See Determining Thermal Media Types on page 288 to determine the media type.
	Media has been loaded incorrectly. The media printable surface must face up towards the printhead. See Getting Ready to Print on page 110 and Loading Media on page 111.
Labels are distorted in size, or the print area start position varies, or the printed image skips between labels (faulty registration).	Media has been loaded incorrectly or the movable media sensor is not set properly. Verify that the sensor is set and positioned correctly for your media type and sensing location. See Loading Media on page 111, Setting Media Sensing by Media type on page 111, and Adjusting the Movable Sensor for Web (Gap) Sensing on page 115.
	The media sensors are not calibrated for your media length, physical properties, or sensing type (gap/notch, continuous, or mark). See Running a SmartCal Media Calibration on page 130. If it still skips labels try Manually Calibrating Media on page 255.
	The platen (drive) roller is slipping or damaged. Clean or replace the platen. See Cleaning and Replacing the Platen on page 213.
	The printer may have communication issues with cables or communication settings. See Resolve Communication Issues on page 239.

Resolve Communication Issues

Use this information to identify problems with communications and their possible causes, and try the recommended solutions.

Issue	Possible Cause(s) and Remedies
USB printer fails to install after connecting printer, before installing the printer driver.	The printer is connected to the Windows computer via USB, but it is not properly recognized by the system. A Windows-assigned printer that is incorrectly assigned cannot print a Windows test print from the selected USB-attached computer. The USB cable was attached before the correct printer drivers were pre-installed. Windows installed the Windows generic printer driver. To fix the problem: 1. Disconnect the printer USB cable from the Windows computer. 2. Use the Windows Search bar to search for and open Control Panel > Devices and Printers. The Zebra printer shows up under the title 'Unspecified'. Zebra printers display ZTC as a prefix to identify them easily.  3. Click on any Zebra printers icons displayed under 'Unspecified' and delete them. 4. If you have not previously loaded the latest Windows printer driver, load it now. See Installing the Windows Printer Drivers on page 146 to add the correct drivers to the system. 5. Plug the printer's USB cable into the Windows computer. The Zebra printer should now be added to the Printers section of the Devices and Printers window.
Label job sent to printer, but data is not transferred to the printer. A label format was sent to the printer but was not recognized. The Data indicator () does not flash.	The communication parameters are incorrect. Check the printer driver or software communications settings (if applicable). If using a serial port connection, check the printer's handshake protocol and serial port settings. The setting used must match the settings of the host computer. See Serial Interface on page 136 for information on the printer's default serial port settings. The serial cable you are trying to use may not be a standard DTE or DCE type cable, is damaged, or is too long in comparison to the RS-232 serial port specifications. See Serial Port Interface on page 261 for details.

Issue	Possible Cause(s) and Remedies
Label job sent. Printer skips labels or prints faulty content. A label format was sent to the printer. Several labels print, then the printer skips, misplaces, misses, or distorts the image on the label.	The serial communication settings are incorrect. Check the printer driver or software communications settings (if applicable). Ensure that the Flow Control settings and other serial port handshake settings match that of the host computer.
Label job sent, data transfers, but there are printing issues. A label format was sent to the printer. Several labels print, then the printer skips, misplaces, misses, or distorts the image on the label.	The prefix and delimiter characters set in the printer do not match the ones in the label format. Verify the ZPL programming prefix (COMMAND CHAR) and delimiter (DELIM. /CHAR) characters. See Configuration Setting to Command Cross-reference on page 296. Incorrect data is being sent to the printer. Check the communication settings on the computer. Ensure that they match the printer settings.
	Incorrect data is being sent to the printer. Check the label format. See the ZPL Programming Guide for details on printer programming. For links to the manuals, see About this Guide on page 11.

Resolve Miscellaneous Issues

Use this information to identify and troubleshoot miscellaneous issues with the printer.

Issue	Possible Cause(s) and Remedies
Settings are lost or ignored.	Some parameters are set incorrectly. Printer settings may have been changed but not saved (for example, the ZPL ^JU command was not used to save the configuration before turning printer power OFF.) Cycle printer power OFF and then back ON to verify settings have been saved. The label format or form commands or commands sent directly to the printer have syntax errors or have been used incorrectly. - A firmware command turned off the ability to change the parameter, or - A firmware command changed the parameter back to default setting. See the ZPL Programming Guide to verify and use the correct command usage and syntax. Links to the location of the guide are in About this Guide on page 11.

Issue	Possible Cause(s) and Remedies
	The prefix and delimiter characters set in the printer do not match the ones in the label format. Verify that the ZPL programming settings of the Control, Command, and Delimiter settings, are correct for your system software environment. Print a Configuration Report or use the Language Menu on the printer display (if present) for these three menu items and compare them to the commands in the label format or form you are trying to print. See Test Printing with the Configuration Report on page 131, Language Menu on page 97 and ZPL Configuration on page 294. The Main Logic Board (MLB) may be malfunctioning. Firmware is corrupted, or the MLB needs service. - Reset the printer to factory defaults. Use the Zebra Setup Utility and select Open Printer Tools > Action > Load printer defaults. - Reload printer firmware. See Updating Printer Firmware on page 230.  NOTE: If the printer does not recover from this error, call a service technician. The MLB is NOT a user serviceable item.
Non-continuous labels are treated as continuous labels. A non-continuous label format with matching media loaded in the printer, was sent to the printer, but it prints like it is continuous media.	The printer was not calibrated for the media being used, or the printer is configured for continuous media. Set the printer for the correct media type (gap/notch, continuous, or mark) and calibrate the printer using Running a SmartCal Media Calibration on page 130, if necessary use Manually Calibrating Media on page 255 for hard-to-calibrate media types. For ZD620 printers with the display, see MEDIA TYPE in the Settings menu to check and set the media type for the media you are using. See Settings Menu on page 71.
The printer locks up. All indicator lights are on and the printer locks up or the printer locks up while restarting.	Printer memory may be corrupted. Try these solutions: - Reset the printer to factory defaults. In the Zebra Setup Utility and select Open Printer Tools > Action > Load printer defaults. See Load Defaults in the Tools menu. See Tools Menu on page 77. - Reload printer firmware. See Updating Printer Firmware on page 230. - If the printer does not recover from this error, call a service technician. Printer memory is not a user-serviceable item. - If the printer does not recover from this error, call a service technician. This is not a user serviceable item.

Issue	Possible Cause(s) and Remedies
Erroneous Ribbon Cartridge Faults A Ribbon Out warning displays, but a ribbon cartridge is installed, or a Ribbon Cartridge Authentication error displays, but a Genuine Zebra Ribbon Cartridge is installed and has NOT been refurbished or altered.	The Ribbon Cartridge Sensor Contact Pins or the Ribbon Cartridge's Smart Chip's contacts may be dirty or the chip may be damaged. • If the ribbon cartridge's smart chip contact looks contaminated, clean it with alcohol and a lightly-moistened cotton. Try a different cartridge if this does not work. • Clean the ribbon cartridge sensor contact pins. See Cleaning the Sensor – Upper Half of the ZD420 Ribbon Cartridge Printers on page 211. • Reload the printer firmware. See Updating Printer Firmware on page 230. • If the printer does not recover from this error, call a service technician. The ribbon cartridge sensor is NOT a user-serviceable item.
Battery shows a red indicator, indicating a fault	The battery has reached its usable life or has a general component failure. Replace the battery. Battery is too hot or too cold. • Remove the battery from the printer and check charge status by charging the battery. • Let the battery cool down or warm up to ambient temperature, then recheck the battery charge. • If the problem is not with the battery charge status or temperature, replace the battery.

Tools

This section provides a variety of tools and utilities built into your printer. They are designed to assist you with setup, configuration, and debugging (printer and command programming).

General Printer Diagnostics

You can diagnose printer issues and get insights into the operating condition of your printer using diagnostic reports, calibration procedures, and other tests.



IMPORTANT: Use full-width media when performing self-tests. If your media is not wide enough, the test labels may print on the platen (drive) roller.

Keep these tips in mind when testing:

- During these self tests, do NOT send data to the printer from the host device. (If your media is shorter than the label to be printed, the test label proceeds to the next label.)
- When canceling a self-test prior to completion, always reset the printer by turning printer power OFF and back ON.
- If the printer is in dispense mode and the liner is being taken up by the applicator, the labels must be removed manually as they become available.

Diagnostic self-tests are enabled by pressing a specific user interface button or combination of buttons while turning printer power ON. Keep the button(s) pressed until the first indicator light turns off. The selected self test automatically starts at the end of the printer's power-on self-test.

Power-On Self Test

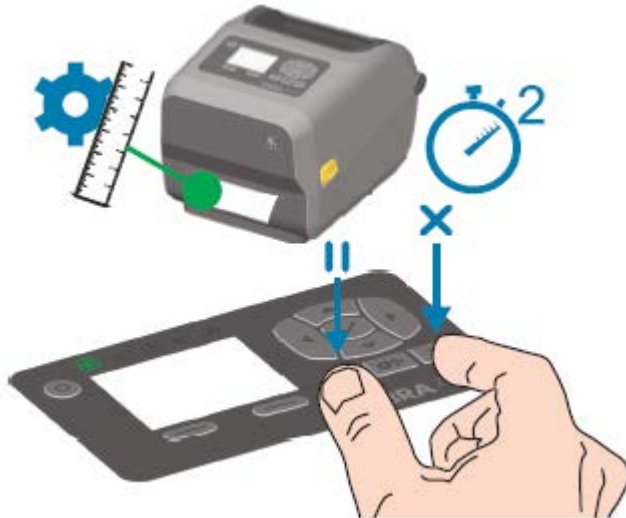
The printer performs a power-on self test each time printer power is turned ON. During this test, the control panel indicators turn on and off to ensure proper operation. At the end of this self test, only the STATUS indicator remains lit.

Running a SmartCal Media Calibration

The printer must set media parameters for optimal operation prior to printing. To do this, it automatically determines the media type (web/gap, black mark/notch, or continuous) and the measure media characteristics.

1. Make sure the media and ribbon (if you are thermal transfer printing) are loaded properly in the printer and the top cover of the printer is closed.

2. Press **POWER** to turn the printer on and wait until the printer is in the Ready state..
The STATUS Indicator lights up solid green
3. Press and hold **PAUSE** and **CANCEL** for two seconds, and release.



The printer measures a few labels and adjusts media sensing levels. When it has completed measuring, the STATUS indicator turns solid green.



NOTE: After initial calibration to a specific media is complete, additional calibrations are not necessary after you load a new batch as long as the newly-loaded media is of the same type as the prior media. The printer will automatically measure the new batch and adjust for any small changes in its characteristics when printing.

After you load a roll of new media from the same batch, simply press **FEED** (Advance) once or twice to synchronize the labels. This readies the printer to continue printing using the new batch of media without the need for recalibration.

Printing the Printer and Network Configuration Reports (CANCEL Self Test)

To print the configuration report:

1. Make sure media is loaded, the printer cover is closed, and printer power is ON.

If printer power is OFF, press and hold **CANCEL** while turning printer power ON, until the STATUS indicator is the only indicator lit.

2. Press **FEED** + **CANCEL** for two seconds.

The Printer and Network Configuration Reports will print and the printer will return to READY status.

PRINTER CONFIGURATION	
Zebra Technologies ZTC ZD410-300dpi ZPL 50J153200130	
+20.0.....	DARKNESS
LOW.....	DARKNESS SWITCH
4.0 IPS.....	PRINT SPEED
+000.....	TEAR OFF
TEAR OFF.....	PRINT MODE
MARK.....	MEDIA TYPE
REFLECTIVE.....	SENSOR SELECT
640.....	PRINT WIDTH
1104.....	LABEL LENGTH
39.0IN 988MM.....	MAXIMUM LENGTH
MAINT. OFF.....	EARLY WARNING
NOT CONNECTED.....	USB COMM.
AUTO.....	SER COMM. MODE
9600.....	BAUD
8 BITS.....	DATA BITS
NONE.....	PARITY
XON/XOFF.....	HOST HANDSHAKE
NONE.....	PROTOCOL
NORMAL MODE.....	COMMUNICATIONS
<~> 7EH.....	CONTROL PREFIX
<~> 5EH.....	FORMAT PREFIX
<~> 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
INACTIVE.....	COMMAND OVERRIDE
NO MOTION.....	MEDIA POWER UP
FEED.....	HEAD CLOSE
DEFAULT.....	BACKFEED
+000.....	LABEL TOP
+0000.....	LEFT POSITION
DISABLED.....	REPRINT MODE
042.....	WEB SENSOR
096.....	MEDIA SENSOR
128.....	TAKE LABEL
070.....	MARK SENSOR
004.....	MARK MED SENSOR
000.....	TRANS GAIN
100.....	TRANS LED
066.....	MARK GAIN
058.....	MARK LED
DPCSWFXM.....	MODES ENABLED
.....	MODES DISABLED
640 12/MM FULL.....	RESOLUTION
3.0.....	LINK-OS VERSION
V77.19.142 <-	FIRMWARE
1.3.....	XML SCHEMA
6.5.0 0.515.....	HARDWARE ID
8192k.....R	RAM
65536k.....E	ONBOARD FLASH
NONE.....	FORMAT CONVERT
ENABLED.....	IDLE DISPLAY
01/01/70.....	RTC DATE
01:11.....	RTC TIME
DISABLED.....	ZBI
2.1.....	ZBI VERSION
READY.....	ZBI STATUS
312 LABELS.....	NONRESET CNTR
312 LABELS.....	RESET CNTR1
312 LABELS.....	RESET CNTR2
1.593 IN.....	NONRESET CNTR
1.593 IN.....	RESET CNTR1
1.593 IN.....	RESET CNTR2
4.047 CM.....	NONRESET CNTR
4.047 CM.....	RESET CNTR1
4.047 CM.....	RESET CNTR2
EMPTY.....	SLOT 1
0.....	MASS STORAGE COUNT
0.....	HID COUNT
OFF.....	USB HOST LOCK OUT
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

Network Configuration	
Zebra Technologies ZTC ZD410-300dpi ZPL 50J153200130	
Wired.....	PRIMARY NETWORK
PrintServer.....	LOAD LAN FROM?
WIRELESS.....	ACTIVE PRINTSRVR
Wireless#	
ALL.....	IP PROTOCOL
172.029.016.068.....	IP ADDRESS
255.255.255.000.....	SUBNET
172.029.016.001.....	GATEWAY
172.029.001.003.....	WINS SERVER IP
YES.....	TIMEOUT CHECKING
300.....	TIMEOUT VALUE
000.....	ARP INTERVAL
9100.....	BASE RAW PORT
9200.....	JSON CONFIG PORT
INSERTED.....	CARD INSERTED
02dfh.....	CARD MFG ID
9134h.....	CARD PRODUCT ID
ac:3f:a4:00:0f:40.....	MAC ADDRESS
YES.....	DRIVER INSTALLED
INFRASTRUCTURE.....	OPERATING MODE
125.....	ESSID
1.....	CURRENT TX RATE
OPEN.....	WEP TYPE
NONE.....	WLAN SECURITY
1.....	WEP INDEX
000.....	POOR SIGNAL
LONG.....	PREAMBLE
YES.....	ASSOCIATED
ON.....	PULSE ENABLED
15.....	PULSE RATE
OFF.....	INTL MODE
usa/canada.....	REGION CODE
usa/canada.....	COUNTRY CODE
0x3FFFFFFF.....	CHANNEL MASK
Bluetooth	
4.3.tpi.....	FIRMWARE
02/13/2015.....	DATE
on.....	DISCOVERABLE
3.0/4.0.....	RADIO VERSION
on.....	ENABLED
AC:3f:a4:00:0f:41.....	MAC ADDRESS
50J153200130.....	FRIENDLY NAME
no.....	CONNECTED
no.....	MIN SECURITY MODE
supported.....	CONN SECURITY MODE
105.....	IOS
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

Printer Network (and Bluetooth) Configuration Report

ZD Series printers with Wired or Wireless connectivity options installed will print an additional printer configuration report. You will need the information in this report to establish and troubleshoot Ethernet (LAN and WLAN), Bluetooth 4.1 and Bluetooth LE network printing.

Use the ZPL `~WL` command to print this report.

Network Configuration	
Zebra Technologies ZTC ZD620-203dpi ZPL 50J164202531	
Wired.....	PRIMARY NETWORK
PrintServer.....	LOAD LAN FROM?
WIRELESS.....	ACTIVE PRINTSRVR
Wired	
ALL.....	IP PROTOCOL
000.000.000.000.....	IP ADDRESS
000.000.000.000.....	SUBNET
000.000.000.000.....	GATEWAY
000.000.000.000.....	WINS SERVER IP
YES.....	TIMEOUT CHECKING
300.....	TIMEOUT VALUE
000.....	ARP INTERVAL
9100.....	BASE RAW PORT
9200.....	JSON CONFIG PORT
Wireless*	
ALL.....	IP PROTOCOL
172.029.016.028.....	IP ADDRESS
255.255.255.000.....	SUBNET
172.029.016.001.....	GATEWAY
172.029.016.003.....	WINS SERVER IP
YES.....	TIMEOUT CHECKING
300.....	TIMEOUT VALUE
000.....	ARP INTERVAL
9100.....	BASE RAW PORT
9200.....	JSON CONFIG PORT
INSERTED.....	CARD INSERTED
02d4H.....	CARD RFID ID
9134H.....	CARD PRODUCT ID
ac:3f:a4:b9:17:b9.....	MAC ADDRESS
YES.....	DRIVER INSTALLED
INFRASTRUCTURE.....	OPERATING MODE
125.....	ESSID
18.0.....	CURRENT TX RATE
OPEN.....	WEP TYPE
NONE.....	WLAN SECURITY
1.....	WEP INDEX
000.....	POWER SIGNAL
LONG.....	PREAMBLE
YES.....	ASSOCIATED
ON.....	PULSE ENABLED
15.....	PULSE RATE
OFF.....	INTL MODE
USA/CANADA.....	REGION CODE
USA/CANADA.....	COUNTRY CODE
0x3FFFFFFF.....	CHANNEL MASK
Bluetooth	
4.3.1p1.....	FIRMWARE
02/13/2015.....	DATE
en.....	DISCOVERABLE
3.0/4.0.....	RADIO VERSION
en.....	ENABLED
ac:3f:a4:b9:17:b9.....	MAC ADDRESS
50J164202531.....	FRIENDLY NAME
no.....	CONNECTED
1.....	MIN SECURITY MODE
no.....	CONN SECURITY MODE
supported.....	IOS
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

1 | iOS Support Setting

iOS devices have Bluetooth Classic 4.X (with 3.0 compatibility) when the Wi-Fi and Bluetooth Classic wireless connectivity option is installed in your printer. This feature, if present, is listed as supported at the end of the Bluetooth Configuration report.

Some ZD420 series printers only have the Bluetooth LE (without Wi-Fi and classic Bluetooth). When the wireless connectivity option is not installed, the iOS setting is noted at the end of the Bluetooth Configuration report as not supported.

Printing a Print Quality Report (FEED Self-Test)

Different types of media may require different darkness settings. Use this simple but effective method for determining the ideal darkness for printing barcodes that are within specifications.

During the FEED self-test, the printer prints a series of labels at different darkness settings at two different print speeds. The barcodes on these labels may be ANSI-graded to show print quality.

During this test, one set of labels is printed at low speed, and another set is printed at the high speed. The darkness value starts at three settings lower than the printer's current darkness value (relative darkness of -3) and increase until the darkness is three settings higher than the current darkness value (relative darkness of +3).

Each label shows the relative darkness and the print speed.

The speed at which labels are printed during this print quality test depends on the dot density of the printhead.

- 300 dpi printers: Prints 7 labels at 51mm/sec (2 ips) and 102 mm/sec (4 ips) print speeds
- 203 dpi printers: Prints 7 labels at 51mm/sec (2 ips) and 152 mm/sec (6 ips) print speeds

Printing a Print Quality Report

You can print a configuration report to use as a reference on the printer's current settings.

1. Press and hold **FEED** () and **CANCEL** () simultaneously for two seconds.
2. Turn printer power OFF.

3. Press and hold **FEED** () while turning printer power ON. Keep pressing the button until the status indicator is the only indicator that is lit.

The printer prints a series of labels at various speeds and darkness settings that are higher and lower than the darkness value shown on the configuration label.

Figure 2 Print Quality Report



4. Inspect the test labels and determine which one has the best print quality for your application.
 - a) If you have a barcode verifier, use it to measure bars and spaces and calculate the print contrast.
 - b) If you do not have a barcode verifier, use your eyes or the system scanner to choose the optimal darkness setting based on the labels printed in this self-test.

Figure 3 Barcode Darkness Comparison

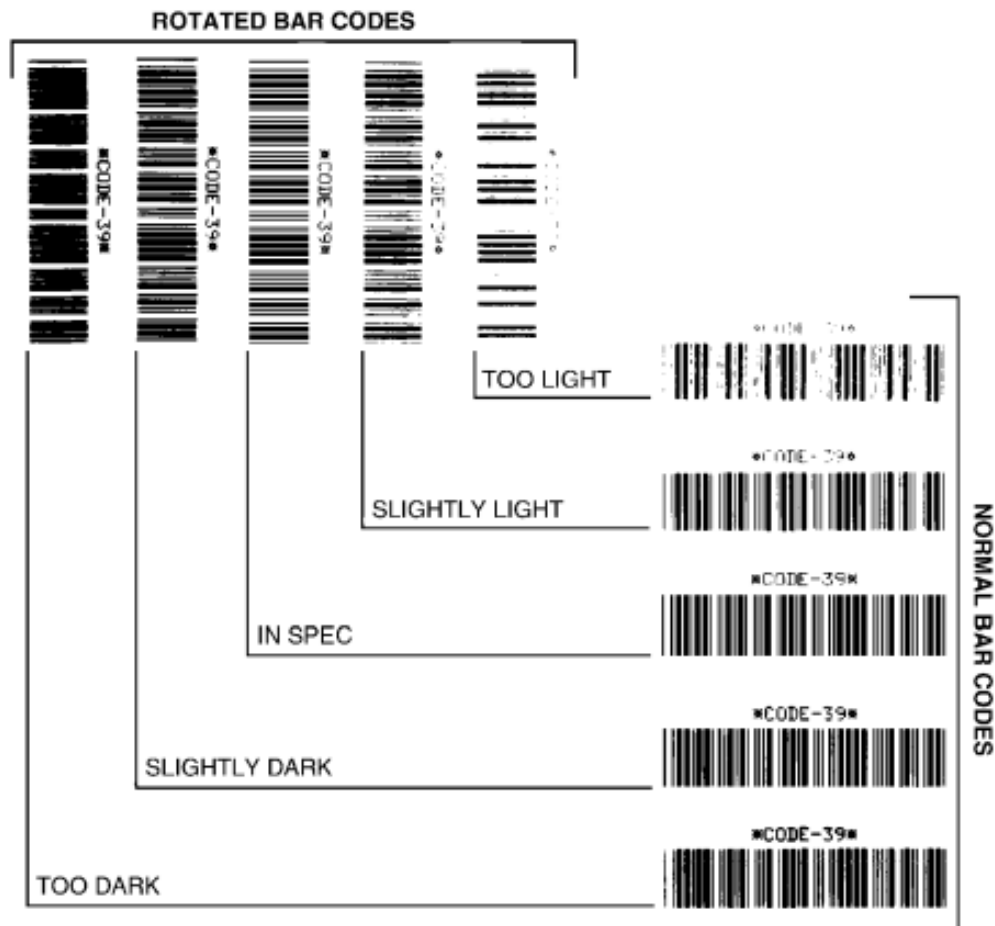


Table 20 Visual Darkness Descriptions

Print Quality	Description
Too dark	Labels that are too dark are fairly obvious. They may be readable but not 'in-spec.' The normal barcode bars increase in size. The openings in small alphanumeric characters may appear filled in. Rotated barcode have bars and spaces run together.

Table 20 Visual Darkness Descriptions (Continued)

Print Quality	Description
Slightly dark	Slightly dark labels are not as obvious. The normal barcode will be 'in-spec'. Small character alphanumeric characters will appear bold and could be slightly filled in. The rotated barcode spaces are small when compared to the 'in-spec' code, possibly making the code unreadable.
"In-spec"	The 'in-spec' barcode can only be confirmed by a verifier, but it should exhibit the following visible characteristics. • The normal barcode will have complete, even bars and clear, distinct spaces. • The rotated barcode will have complete, even bars and clear, distinct spaces. Although it may not look as good as a slightly dark barcode, the barcode will be 'in-spec'. • In both normal and rotated styles, small alphanumeric characters look complete.
Slightly light	Slightly light labels are, in some cases, preferable to slightly dark ones for 'in-spec' barcodes. Slightly light labels are, in some cases, preferable to slightly dark ones for 'in-spec' barcodes. Both normal and rotated barcodes will be in spec, but small alphanumeric characters may not be complete.
Too light	Labels that are too light are obvious. Both normal and rotated barcodes have incomplete bars and spaces. Small alphanumeric characters are unreadable.

5. Note the relative darkness value and the print speed printed on the best test label.
6. Add or subtract the relative darkness value from the darkness value specified on the Printer Configuration label. The resulting numeric value is the best darkness value for that specific label and print speed combination.
7. If necessary, change the current darkness value of the printer to the darkness value on the best test label. See [Darkness Control Switch](#) on page 174.
8. If necessary, change the current print speed to the speed value on the best test label. See two options for how to do this in [Adjusting Print Quality](#) on page 173.

Resetting Non-Network Printer Configuration Settings to their Factory Defaults

Use these instructions to reset the non-network printer settings to their factory defaults

1. Turn printer power OFF.
2. Press and hold **PAUSE** () and **FEED** () simultaneously and turn printer power ON.

3. Continue holding these buttons until the STATUS indicator () is the only indicator lit.



NOTE: The printer has a **RESET** button on its underside. See [RESET Button Functions](#) on page 251 for information on how to use this button.

After the non-network printer configuration settings are reset, calibrate the sensor. See [Running a SmartCal Media Calibration](#) on page 130 and [Manually Calibrating Media](#) on page 255.

Resetting the Printer's Network Settings to Their Factory Defaults

Use this procedure to reset only the printer's network settings to their factory defaults.

1. Turn printer power OFF.
2. Press and hold **PAUSE** () and **CANCEL** () simultaneously and turn printer power ON.
3. Continue holding these buttons until the Status indicator () is the only indicator that is lit.

The printer's network configuration is reset to factory defaults. The printer does not output Printer or Network Configuration labels at the end of this procedure.

RESET Button Functions

Your printer has a dedicated **RESET** button on its lower surface which is pressed using a paper clip or similar small object.

Press this **RESET** button for the length of time specified below as needed to perform the listed functions.

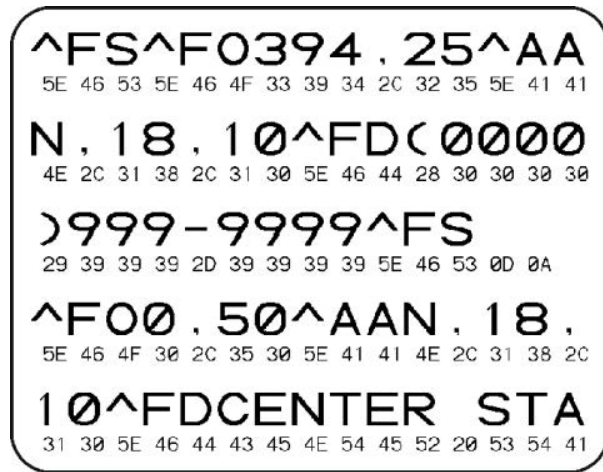


1	Reset access aperture
1 second or under	No effect.
1–5 seconds (printer reset)	The printer performs a factory reset, then prints a Printer Configuration label (and a Network Configuration label if connected to a network).
6–10 seconds (network connection reset, for printers connected to a network)	The printer drops the network connection, resets its network settings to their factory defaults, and prints a Printer Configuration label and a Network Configuration label.
More than 10 seconds (Reset mode exit)	The printer does NOT reset. The printer and network parameters are left unchanged.

Performing a Communication Diagnostics Test

This is a troubleshooting test used to check the connection between the printer and its host computer or device.

When the printer is in Diagnostics mode, it prints all data received from the host computer as straight ASCII characters, with the hex values printed below the ASCII text. The printer prints all the characters it receives. This includes control codes such as CR (carriage return). The test label prints upside-down as it exits the printer.

Figure 4 Typical Communications Diagnostics Test Label

To print this test label:

1. Ensure media is loaded and printer power is ON.
2. Set the print width equal to, or less than, the width of the label being used for the test.
3. Press and hold **PAUSE** () and **FEED** () simultaneously for two seconds.

When active, the Status indicator () alternately lights up Green and Yellow.

The printer enters Diagnostics mode and prints any data received from the host computer or management device on a test label.

4. Check the test label for error codes. If any errors are shown, verify if the communication parameters are correctly set.

Errors show on the test label as follows:

FE	Framing error
OE	Overrun error
PE	Parity error
NE	Noise

5. to exit the self-test and return to normal operations, press and hold **PAUSE** () and **FEED** () simultaneously for two seconds, or turn printer power OFF and back ON.

Sensor Profile

Use the sensor profile image—which typically prints across several labels or tags—for diagnostics if the printer is not accurately sensing gaps between labels, if it incorrectly identifies pre-printed areas on a label as gaps, or cannot detect ribbon.

To print a sensor profile using the printer buttons, turn printer power OFF, then turn printer power ON while holding down **FEED** and **CANCEL** simultaneously. Continue pressing these buttons until the Status indicator is the only indicator that remains lit.

To print the sensor profile using ZPL, send a ~JG command to the printer. See the ZPL Programming Guide for more information on this command.

Compare your results to the examples shown in [Performing a Communication Diagnostics Test](#) on page 252. If sensor sensitivity must be adjusted, calibrate the printer. See [Manually Calibrating Media](#) on page 255.

Figure 5 Sensor Profile (Gap Media)

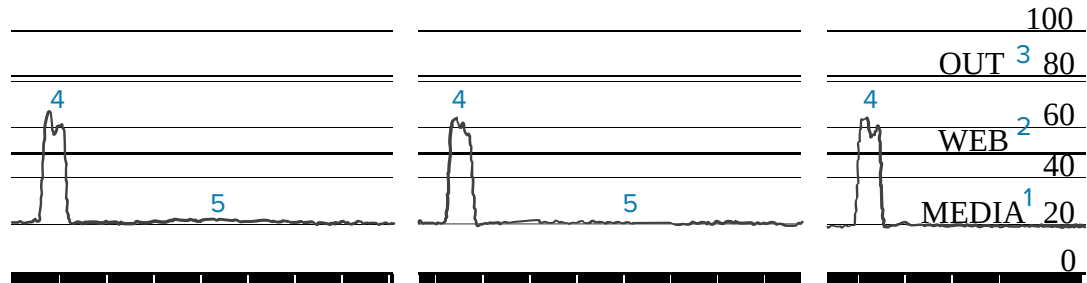
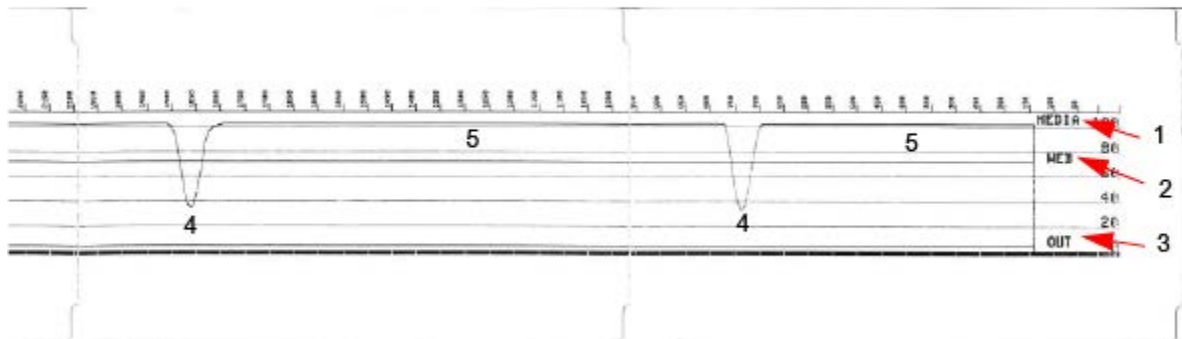


Figure 6 Sensor Profile (Black Mark Tag Media)



1	MEDIA (media sensor readings line)
2	WEB (media sensor threshold settings line)
3	OUT (media out threshold line)
4	Upward spikes indicating gaps between labels (the 'web')
5	Lines between the spikes (indicate where labels are located)

Compare the sensor profile printout to a length of one media form (ex., a label). The spikes should be the same distance apart as the gaps are situated on the media.



NOTE: If the gap distances are not the same, the printer may be having difficulty determining where the gaps are located.

Activating Advanced Mode

Use Advanced mode to access the printer's manual adjustment modes.

1. Ensure media is loaded and printer power is turned ON.

2. Press **PAUSE** () for two seconds.

All indicators flash yellow. The Status indicator () lights solid yellow, indicating Manual Media Calibration mode is selected.

3. To sequentially cycle through the available modes, press **FEED** ().
4. To activate the selected mode, press **PAUSE** ().
5. To exit Advanced mode, press **CANCEL** ().

Manually Calibrating Media

Use these steps to manually calibrate the printer for the loaded media.

This Advanced mode is typically used to calibrate the printer to media that is not correctly recognized during Smart Calibration.

You may have to perform this manual calibration several times, moving the media sensor each time, until the printer completes the calibration process and returns to ready state.

To manually calibrate the printer to the media:

1. Place the printer in Advanced Mode (see [Activating Advanced Mode](#) on page 254) and press **PAUSE** () while the Status indicator () is lit yellow.

The Supplies indicator () flashes yellow, after which the Pause indicator () flashes.

2. Open the printer and verify the media sensor is in the center position for label/gap (transmissive) sensing.

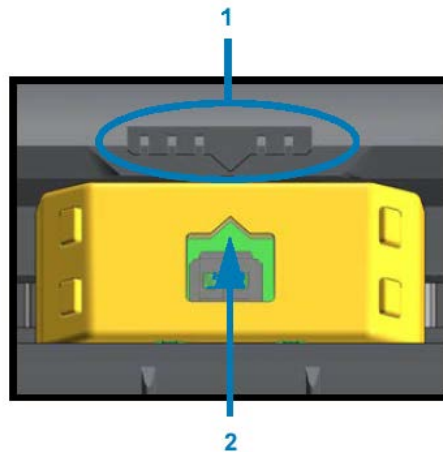


Figure 7

1	Sensor alignment key
2	Alignment arrow (default position)



NOTE: For black-mark or notch media, set the media sensor to the proper location to sense the mark or notch. For pre-printed media with print either on the front of the label or on the back of the liner, position the sensor to a place where it will minimally sense (that is, encounter) the pre-print.

3. Remove 80 mm (3 in.) of labels from the liner, then place the label-free area of the liner over the platen (drive) roller such that the leading edge of the first label is under the media guides.

4. Close the printer and press **PAUSE** () one time.

The Media indicator () flashes while the printer measures the media liner. When complete, the Pause indicator () begins to flash.

5. Open the printer and reposition the media to locate a label directly above the movable sensor.

6. Close the printer and press **PAUSE** () one time.

The printer feeds and measures several labels. If it is able to determine the correct media type (gap, black mark, or notch) and measure the media length, it returns to Ready state.

Manual Print Width Adjustment

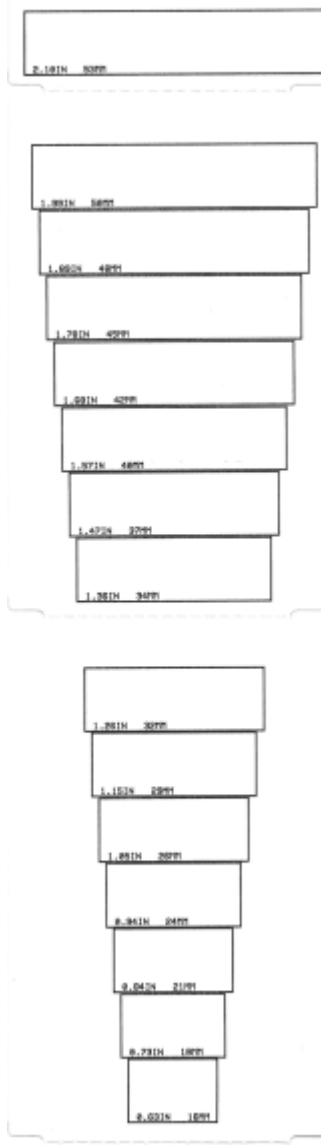
You can manually adjust the print width for your printer depending on your printing needs.

Place the printer in Advanced mode. See [Activating Advanced Mode](#) on page 254. Then press **PAUSE** () while the Pause indicator () lights up yellow.

The printer prints a 16 mm (0.63 in.) box, pauses momentarily, prints a slightly larger box, and pauses again, and so on.

When you see the printer print a box that matches the width of your media, press **FEED** () to select that print width and return the printer to Ready state for printing.

To return to the maximum print width setting, refrain from pressing **FEED** () and allow the printer to proceed until it reaches that width.



Manual Print Darkness Adjustment

To initiate a Manual Print Darkness Adjustment, press **PAUSE** () while the data indicator () is illuminated yellow.

The printer will print a test pattern showing the current darkness number and several barcode patterns and then pause momentarily. It will then repeat the pattern with the next darkness level.

When you see the printer print a pattern with solid, even black lines, press **FEED** () to set the darkness to that value and return the printer to Ready state.



Factory Test Modes

When placed in these modes, the printer begins printing various test patterns which you can use to evaluate printer performance.

Your ZD series printer comes with the following print modes which are intended for factory tests:

Test mode 1	Hold PAUSE () when turning printer power ON to initiate this mode.
Test mode 2	Hold PAUSE (), FEED (), and CANCEL () all simultaneously for two seconds with printer power ON to initiate this mode.



NOTE: These test modes consume a considerable amount of media.

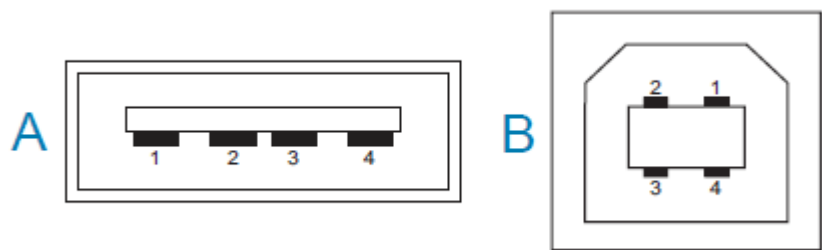
To exit either mode, press and hold **POWER**down while switching printer power OFF. Release the button when the printer has fully powered down.

Interface Connector Wiring

This section details the connector wiring for the printer connector interface.

Universal Serial Bus (USB) Interface

IMPORTANT: When used with third-party cables, your printer requires USB cables—or USB cable packaging—that bears the “Certified USB” mark to guarantee USB 2.0 compliance. Visit usb.org for details.



Type A and Type B connectors require different pinouts.

USB A style connector pinouts (A in the image shown)	Pin 1 — Vbus (+5 VDC). (Pin 2 — D- (Data Signal, Negative Side) Pin 3 — D+ (Data Signal, Positive Side) Pin 4 — Shell (Shield/Drain Wire) Shell
USB B style connector pinouts (B in the image shown)	Pin 1 — Vbus (Not Connected) Pin 2 — D- (Data Signal, Negative Side) Pin 3 — D+ (Data Signal, Positive Side) Pin 4 — Shell (Shield/Drain Wire) Shell

IMPORTANT: USB Host +5 VDC power source is shared with serial-port phantom power. It is limited to 0.5mA per USB Specification and with on-board current limiting. The maximum current available through the serial port and USB port should not exceed a total of 0.75 Amps.

Serial Port Interface

The ZD 620 / ZD420 printer uses Zebra Auto-Detecting DTE and DCE for 9-Pin RS-232 Interface.

Pin	DTE	DCE	Description (DTE)
1	—	5V	Not used
2	RXD	TXD	RXD (receive data) input to the printer.
3	TXD	RXD	TXD (transmit data) output from the printer.
4	DTR	DSR	DTR (data terminal ready) output from the printer -- controls when the host may send data.
5	GND	GND	Circuit ground.
6	DSR	DTR	DSR (data set ready) input to the printer.
7	RTS	CTS	RTS (request to send) output from the printer -- always in the ACTIVE condition when the printer is turned on.
8	CTS	RTS	CTS (clear to send) - Not used by the printer.
9	5V	—	+5 V @ 0.75 A - FET Circuit current limited.



IMPORTANT: The maximum current available through the serial port, USB port or both will not exceed a total of 0.75 Amps.

When XON/XOFF handshaking is selected in the printer driver, data flow is controlled by the ASCII control codes DC1 (XON) and DC3 (XOFF). The DTR control lead will have no effect.

Interconnecting to DTE Devices

The printer is configured as data terminal equipment (DTE). To connect the printer to other DTE devices (such as the serial port of a personal computer), use an RS-232 null modem (crossover) cable. [Table 21 Connecting the Printer to a DTE Device](#) on page 261 shows the required cable connections.

Table 21 Connecting the Printer to a DTE Device

DB-25S Connector to DTE Device (PC)	DB-9P Connector to Printer	DB-9S Connector to DTE Device (PC)	DB-9P Connector to Printer

Interconnecting to DCE Devices

: When the printer is connected via its RS-232 interface to data communication equipment (DCE) such as a modem, a STANDARD RS-232 (straight-through) interface cable must be used. [Table 22 Connecting the Printer to a DCE Device](#) on page 262 shows the connections required for this cable.

Table 22 Connecting the Printer to a DCE Device

DB-25S Connector to DCE Device		DB-9P Connector to Printer		DB-9S Connector to DCE Device		DB-9P Connector to Printer	
2	RXD	DCD	1	1	DCD	DCD	1
3	TXD	RXD	2	2	TXD	RXD	2
4	CTS	TXD	3	3	RXD	TXD	3
5	RTS	DTR	4	4	DSR	DTR	4
6	DTR	GND	5	5	GND	GND	5
7	GND	DSR	6	6	DTR	DSR	6
8	DCD	RTS	7	7	CTS	RTS	7
20	DSR	CTS	8	8	RTS	CTS	8
22			9	9			9

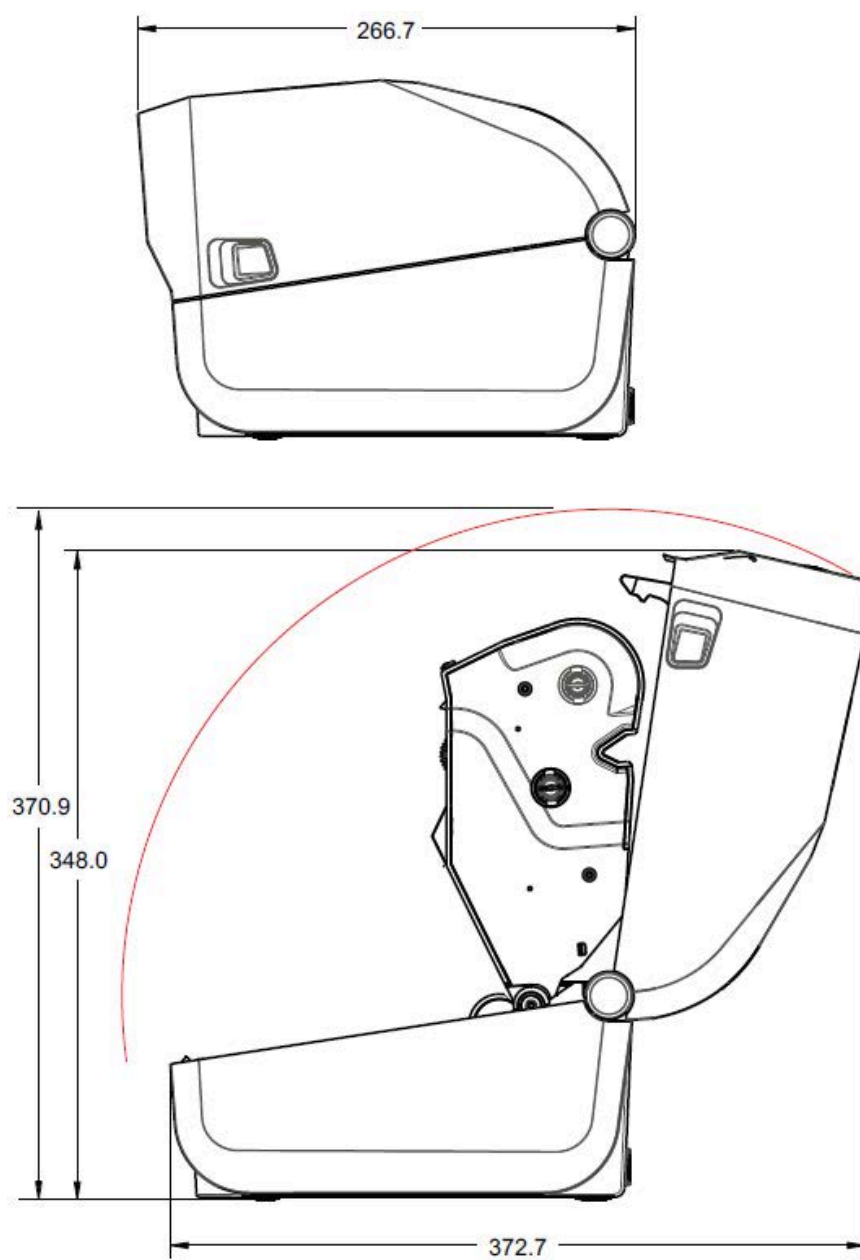
Dimensions

This section lists the external dimensions for the ZD620 and ZD420 Thermal Transfer printers, Ribbon Cartridge Thermal Transfer printers, and Direct Thermal printers.

ZD620 / ZD420 Dimensions – Thermal Transfer Models

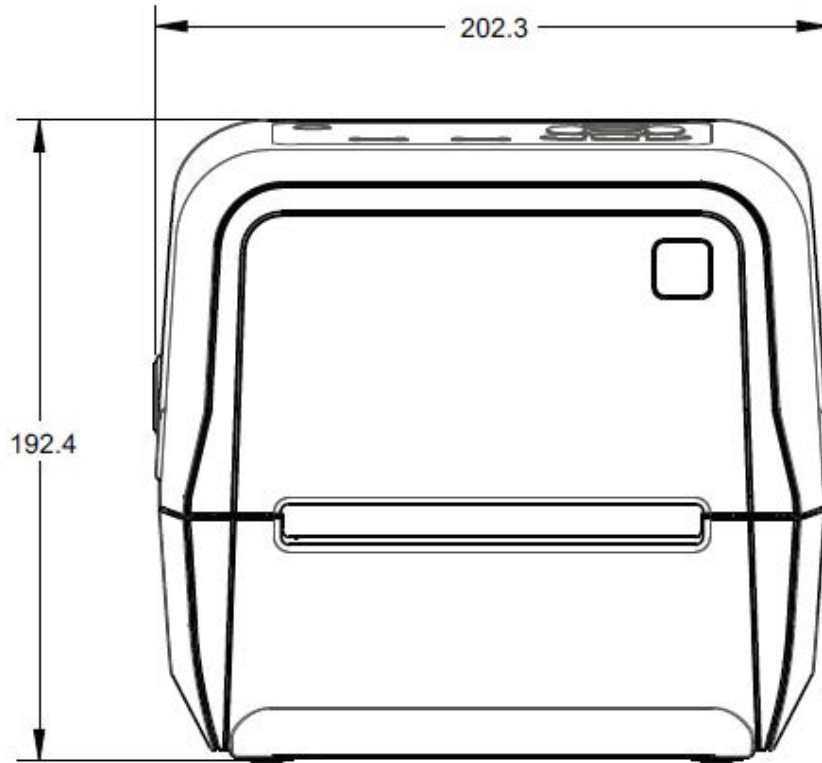
Dimensions are in millimeters.

Figure 8 Standard Printer



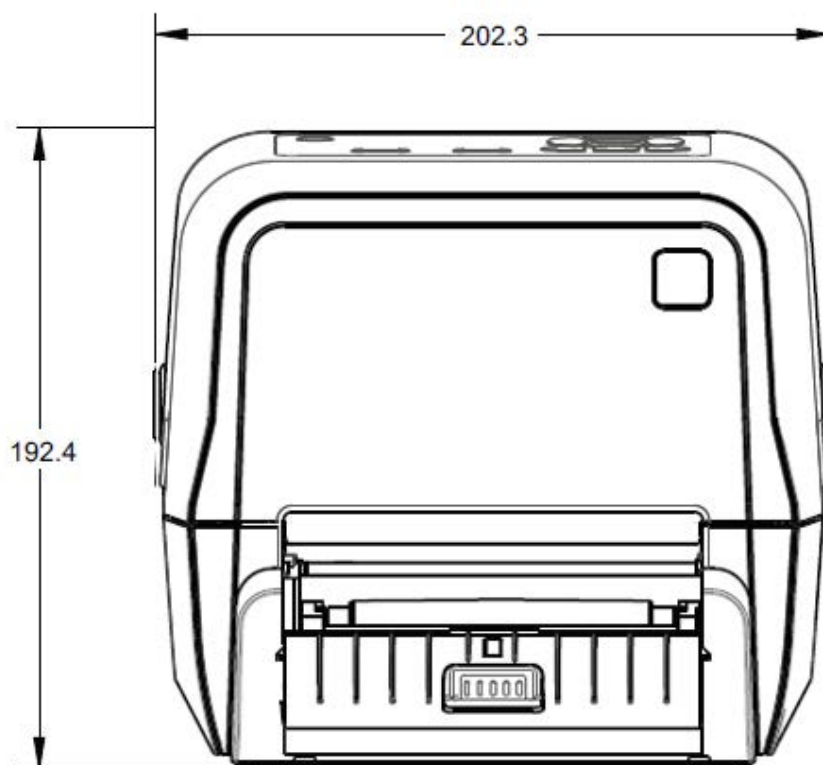
Dimensions are in millimeters.

Figure 9 Standard Printer



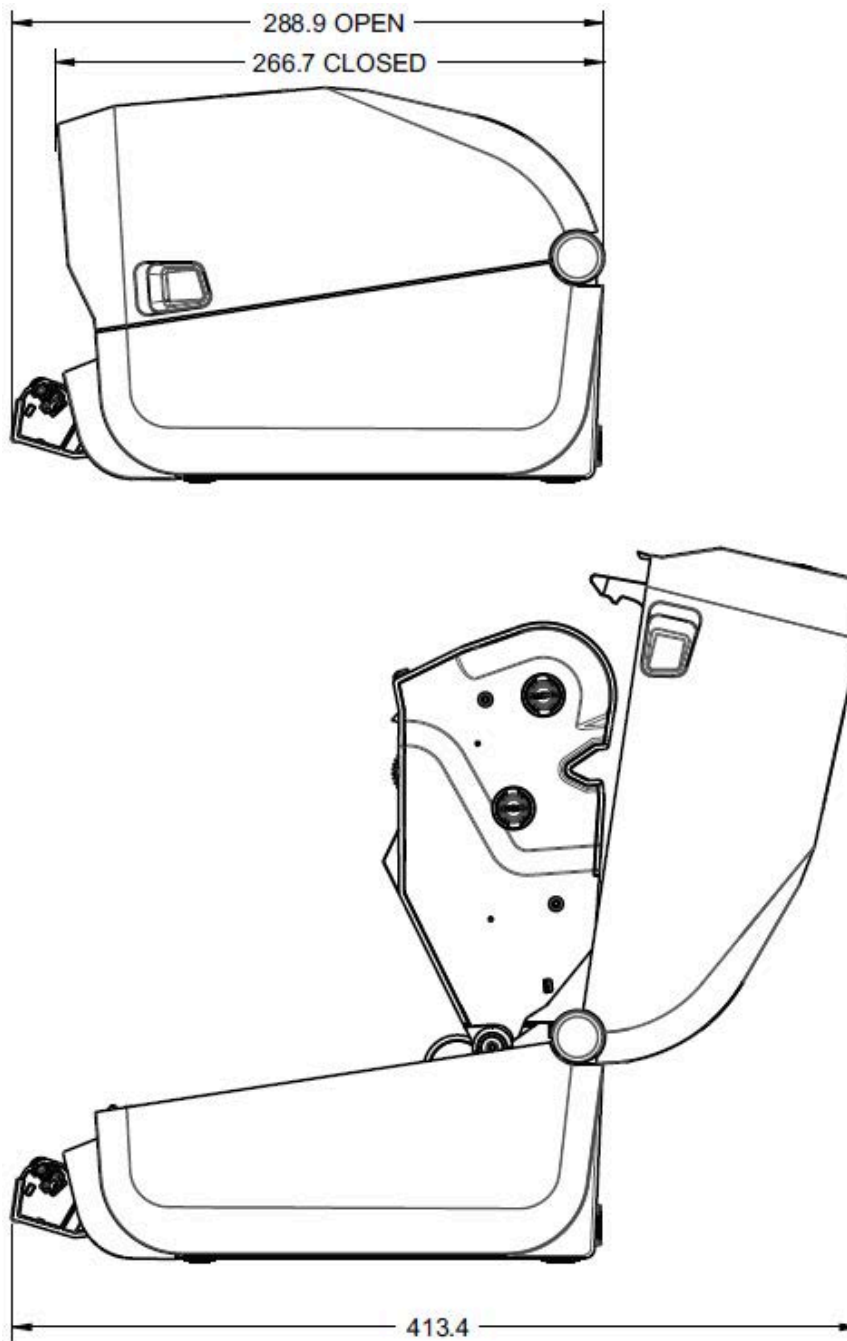
Dimensions are in millimeters.

Figure 10 Printer with Label Dispenser (Open)



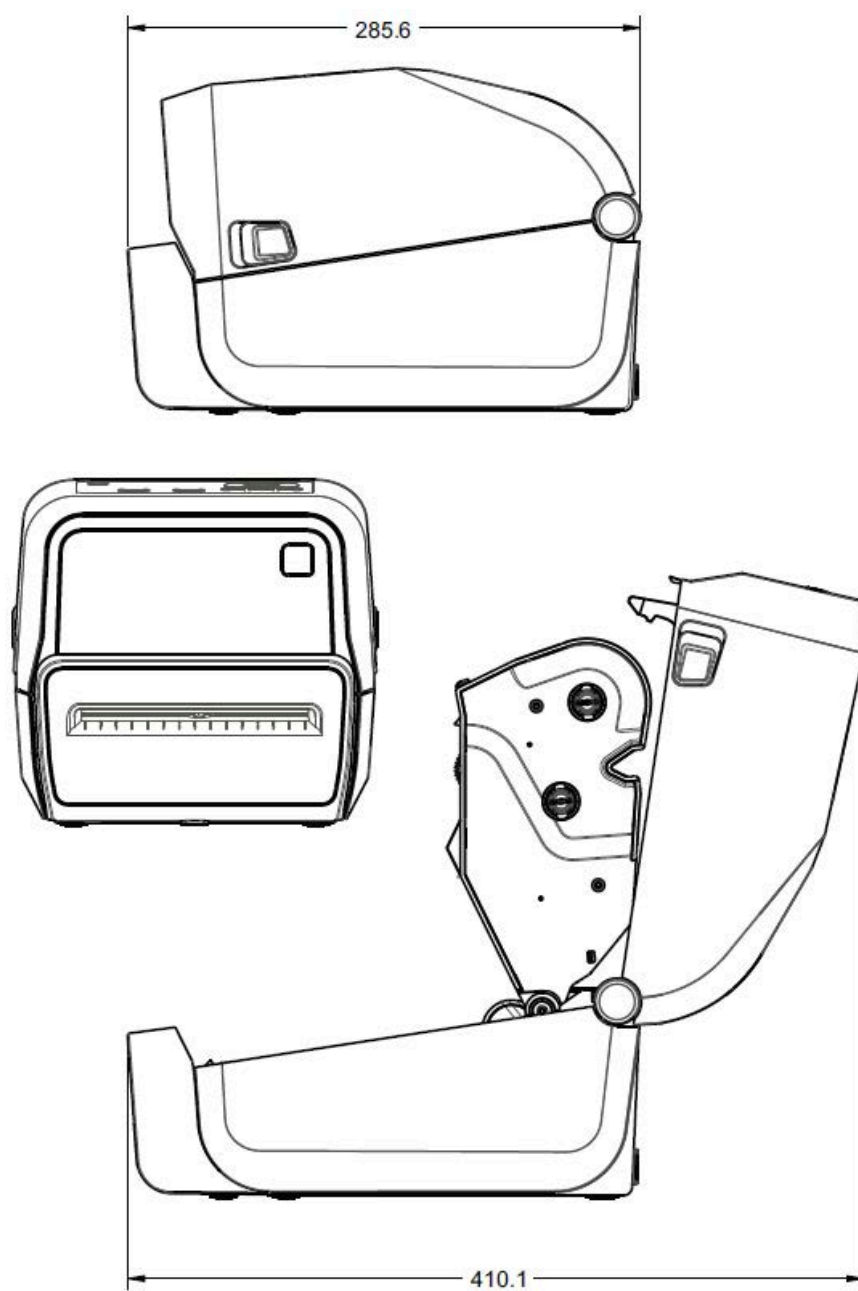
Dimensions are in millimeters.

Figure 11 Printer with Label Dispenser (Open)



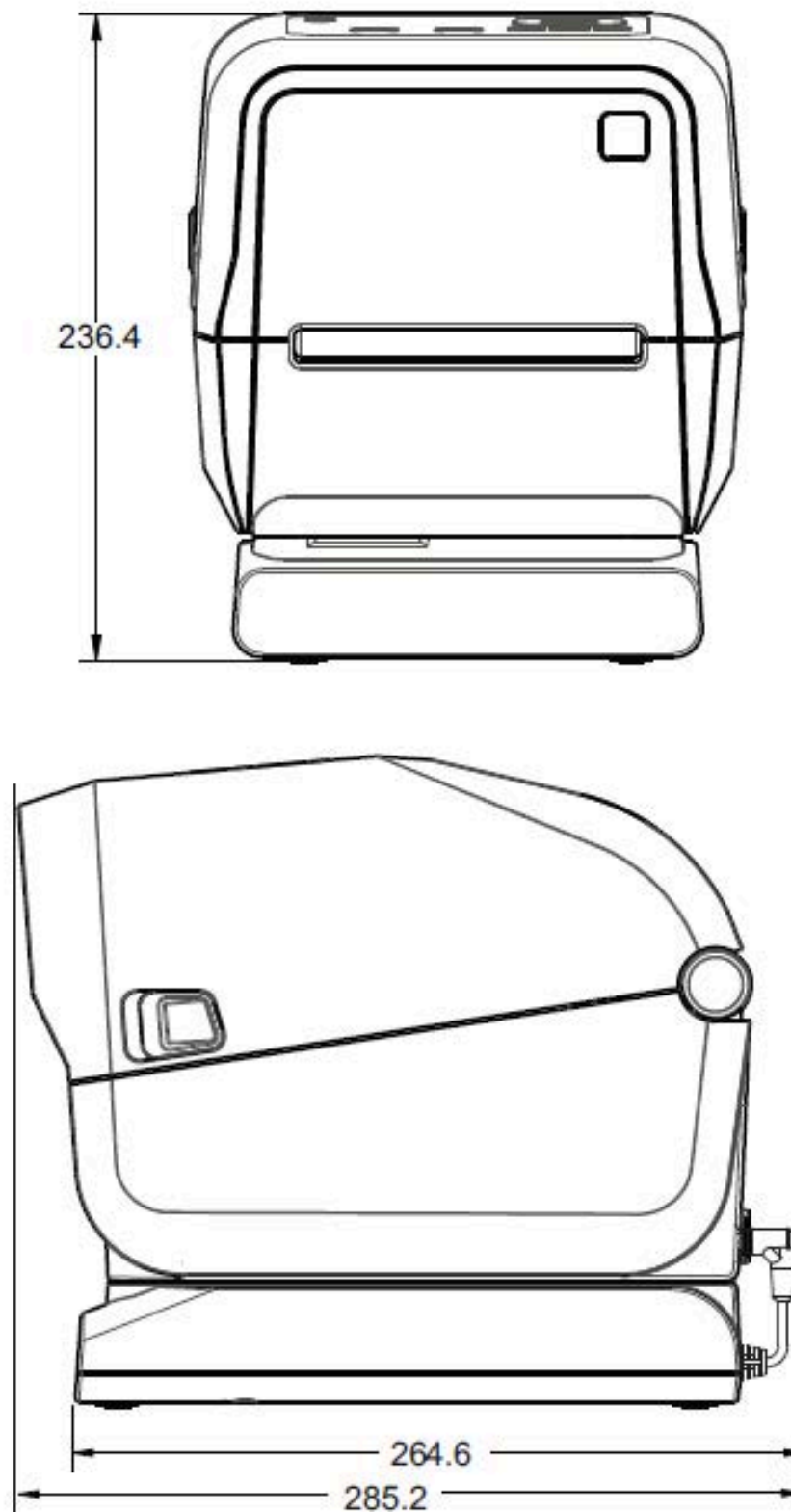
Dimensions are in millimeters.

Figure 12 Printer with Cutter



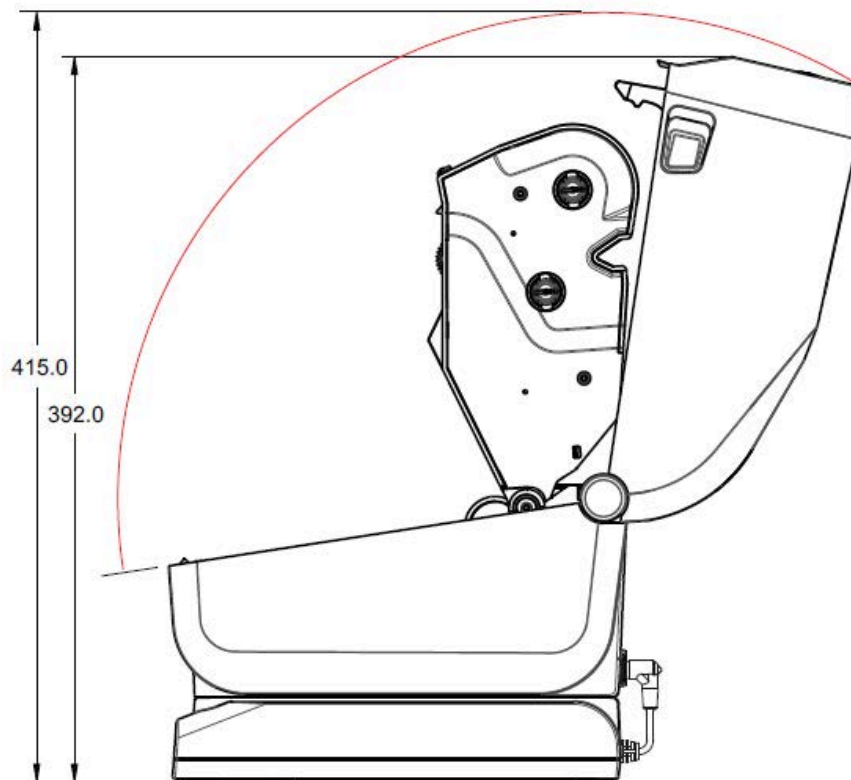
Dimensions are in millimeters.

Figure 13 Printer with Attached Power Supply Base



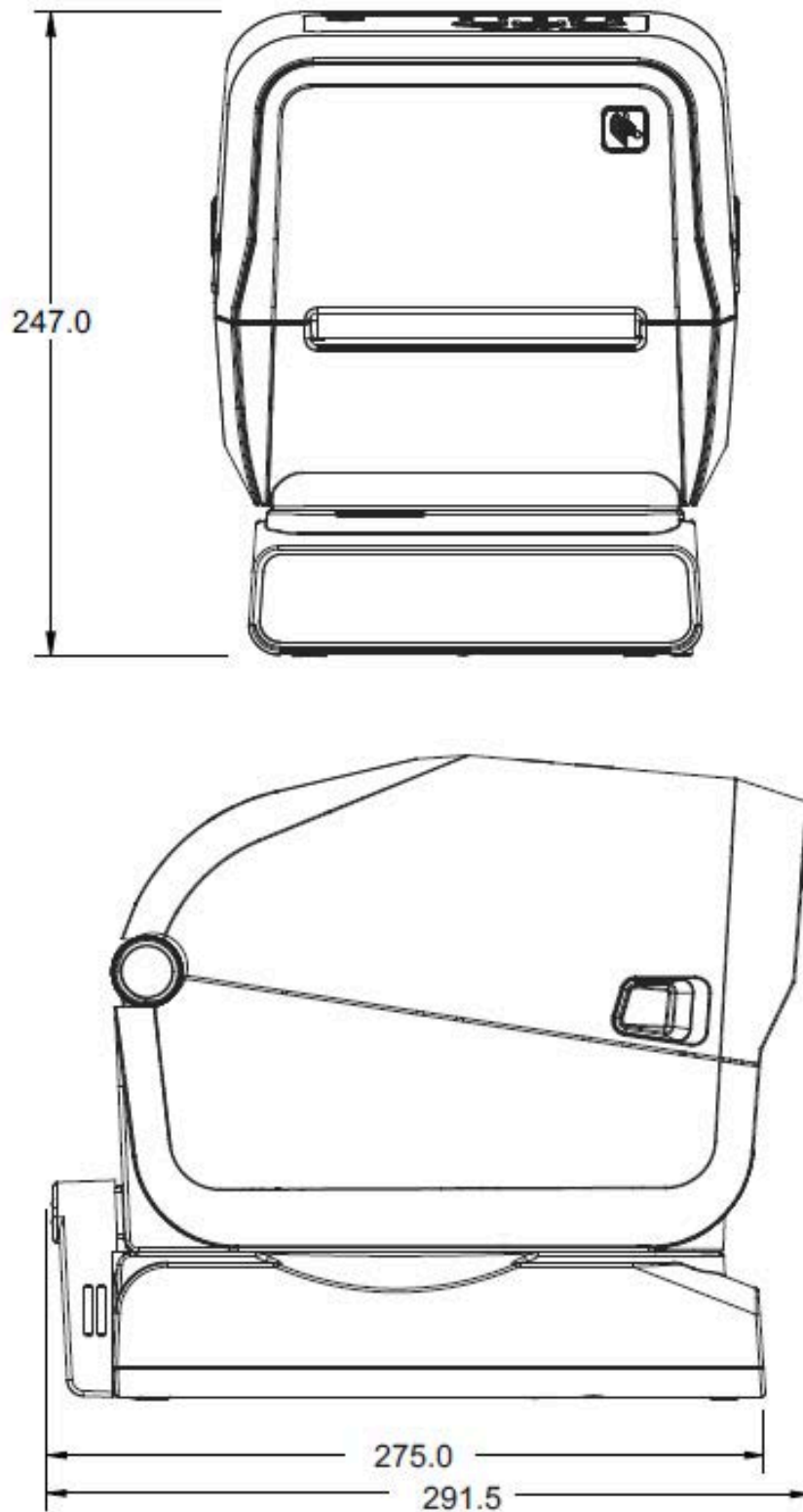
Dimensions are in millimeters.

Figure 14 Printer with Attached Power Supply Base (open)



Dimensions are in millimeters.

Figure 15 Printer with Attached Battery Base and Battery

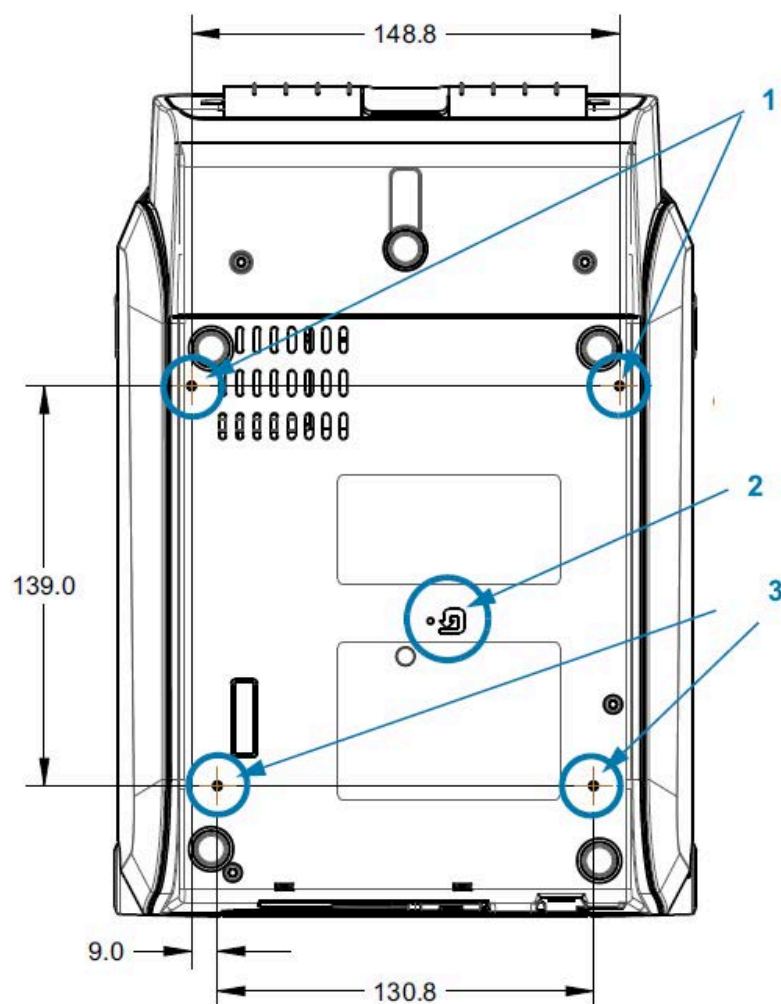


Dimensions are in millimeters. For mounting, use M3 thread-forming screws with maximum hole depth of 6 mm into the printer body.



CAUTION: Do not remove the rubber feet or the printer can overheat.

Figure 16 Mounting Specifications

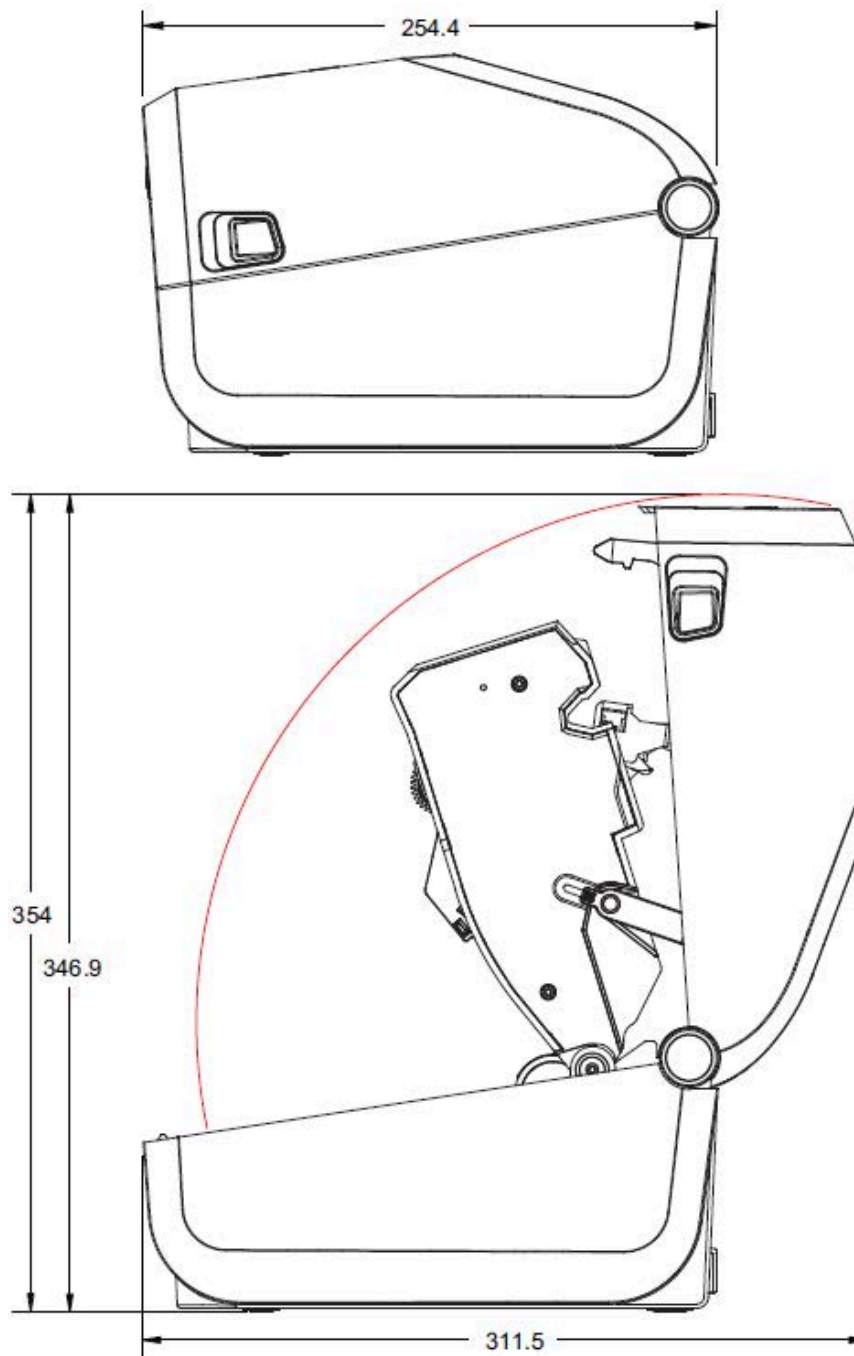


1	Mounting holes
2	Hardware reset access (provide 20-25 mm hole in mounting plate or surface)
3	Mounting holes

ZD420 Dimensions – Ribbon Cartridge Thermal Transfer Models

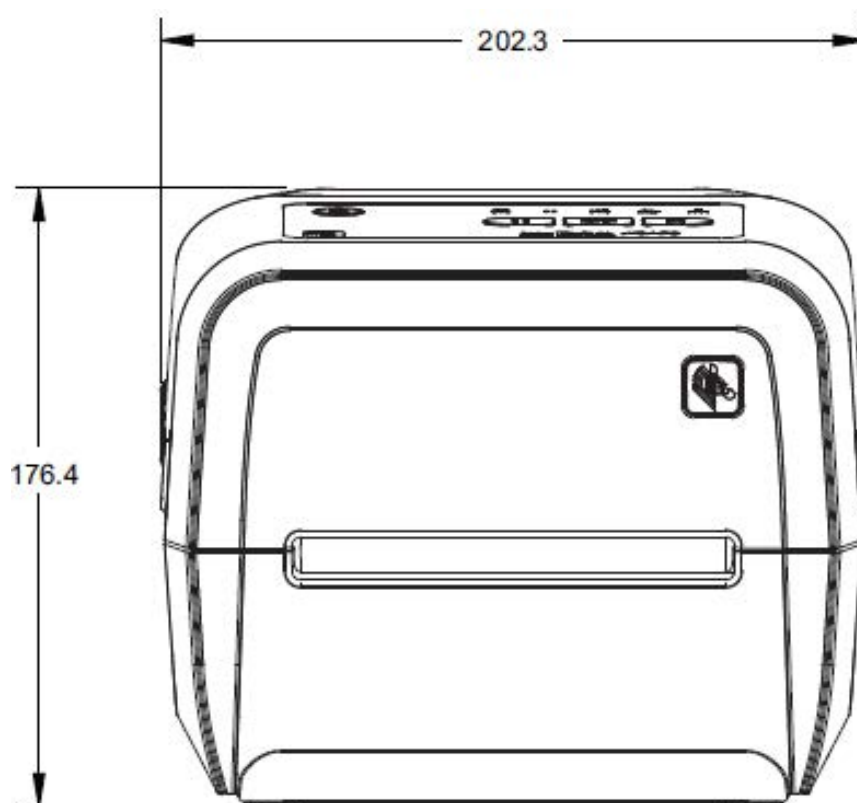
All dimension are in millimeters.

Figure 17 Standard Ribbon Cartridge Thermal Transfer Printer



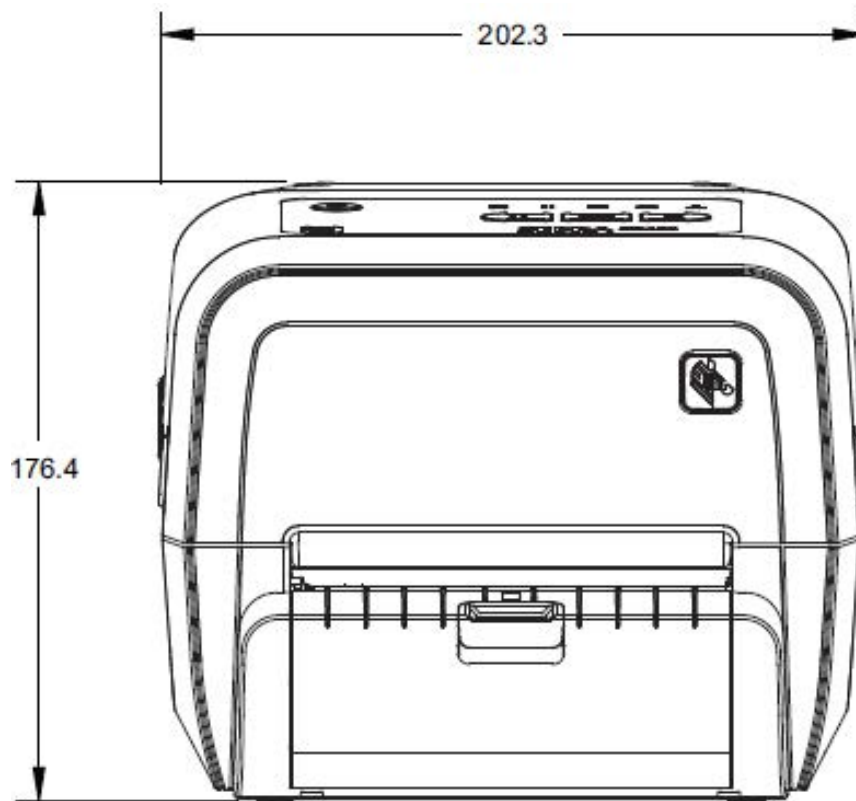
All dimension are in millimeters.

Figure 18 Standard Ribbon Cartridge Thermal Transfer Printer



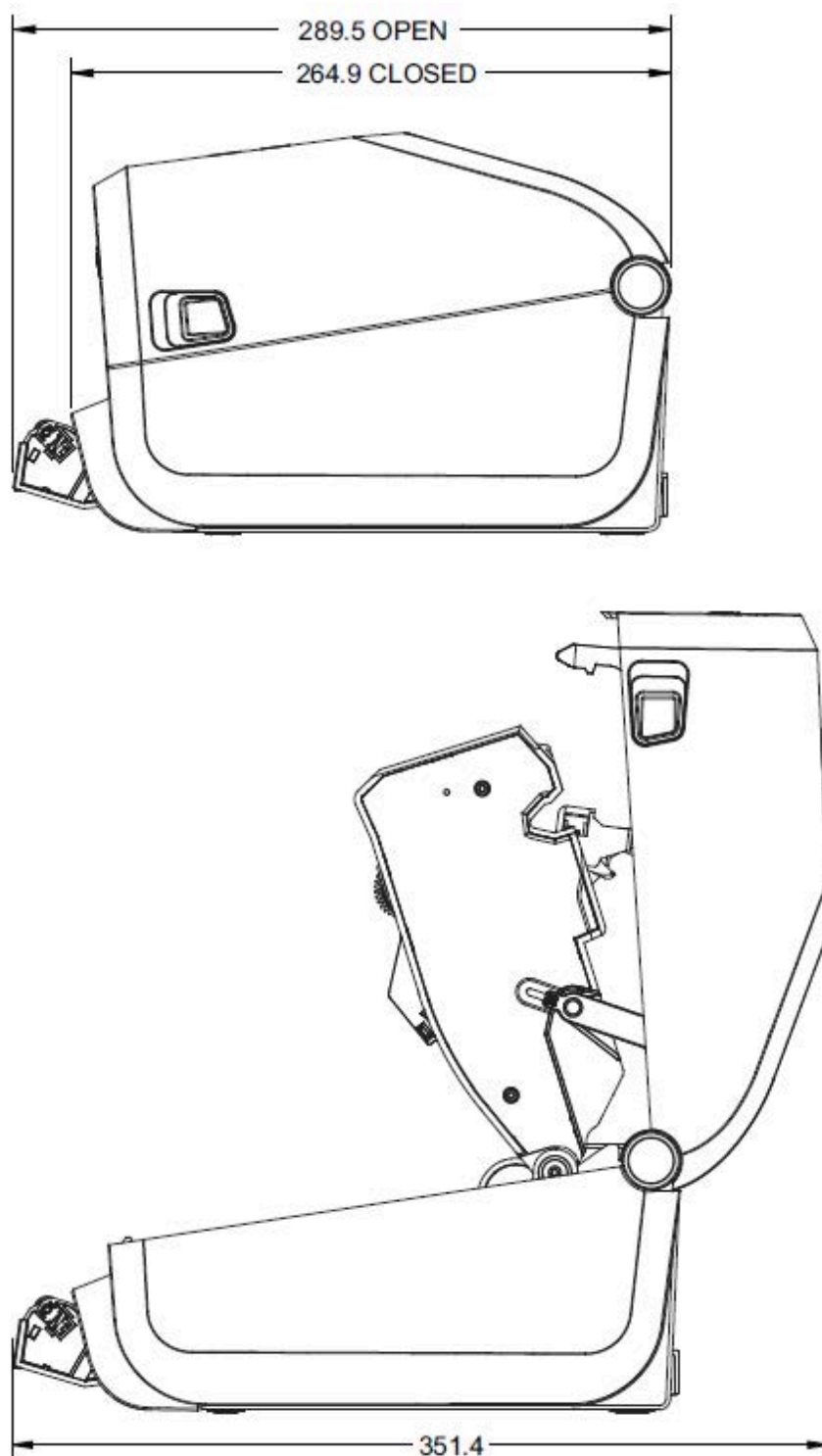
All dimension are in millimeters.

Figure 19 Ribbon Cartridge Thermal Transfer Printer with Label Dispenser (closed)



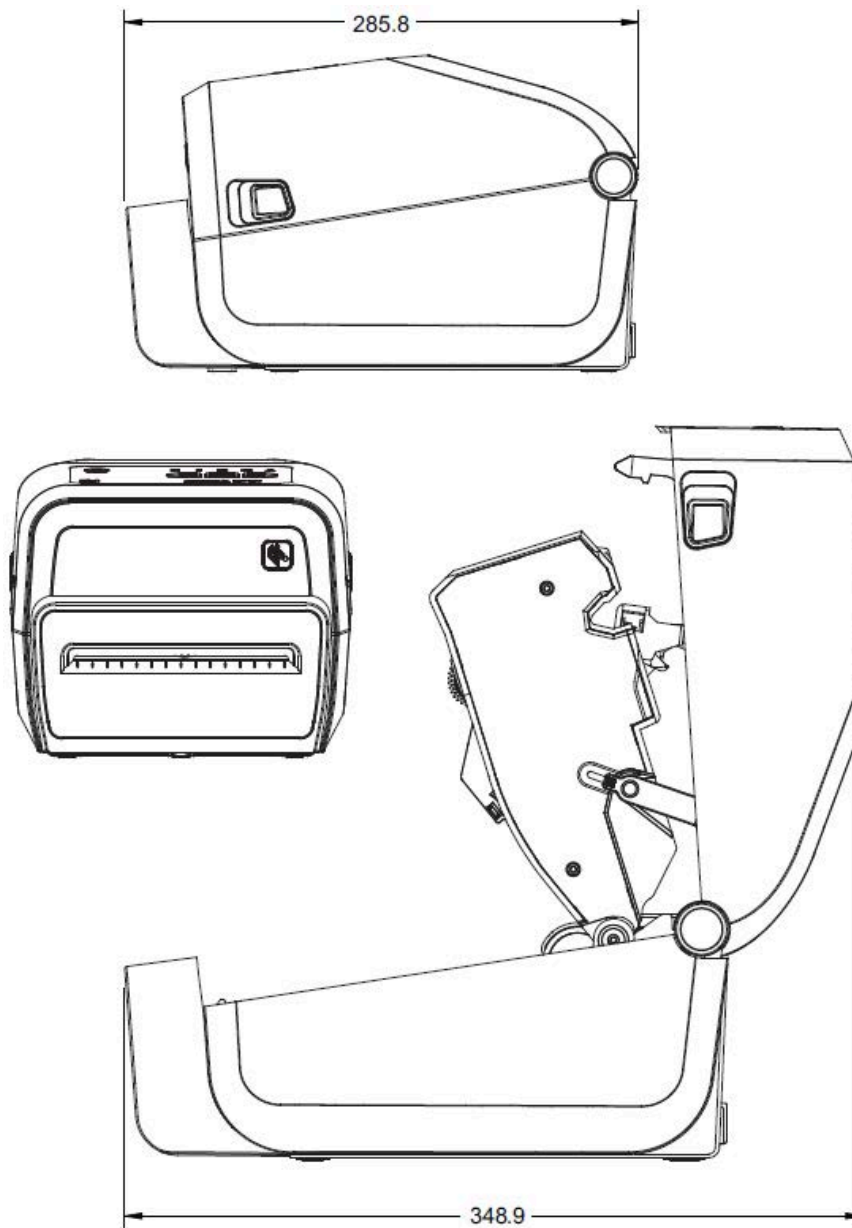
All dimension are in millimeters.

Figure 20 Ribbon Cartridge Thermal Transfer Printer with Label Dispenser (open)



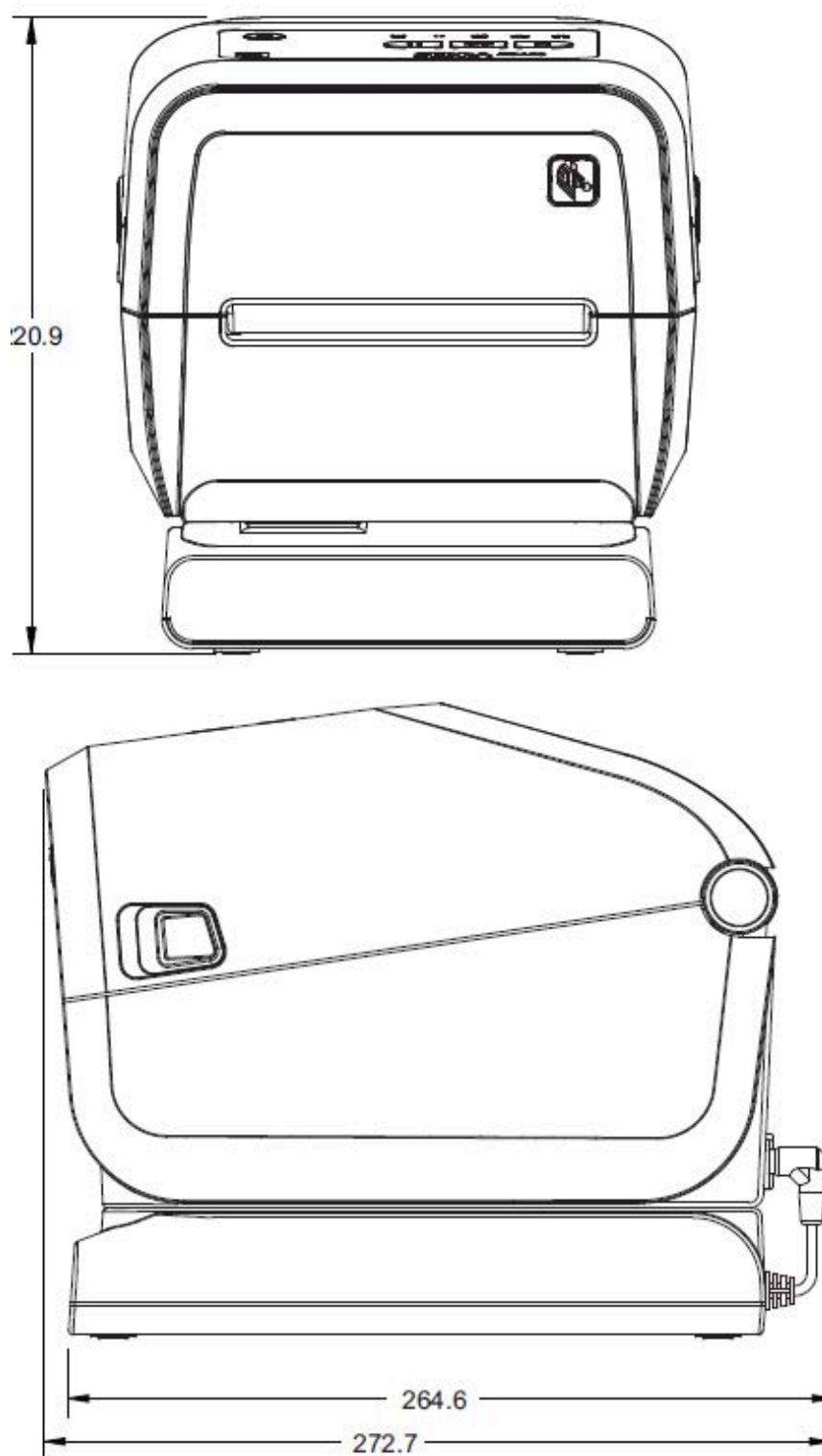
All dimension are in millimeters.

Figure 21 Ribbon Cartridge Thermal Transfer Printer with Cutter



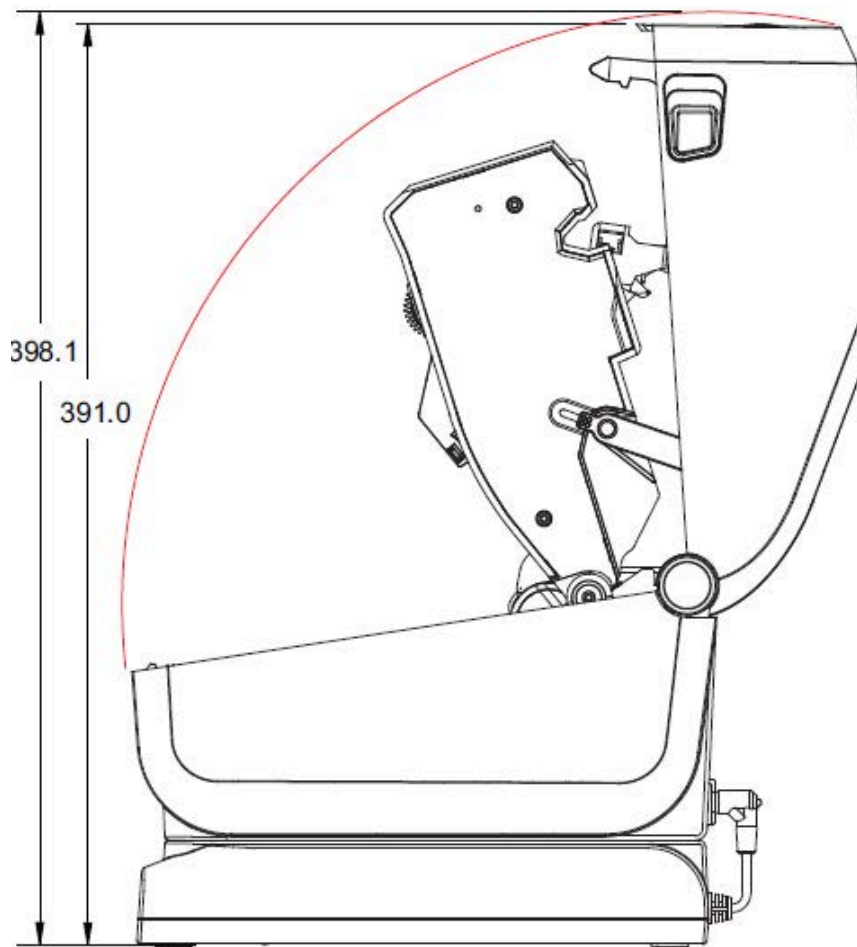
All dimension are in millimeters.

Figure 22 Ribbon Cartridge Thermal Transfer Printer with Attached Power Supply Base



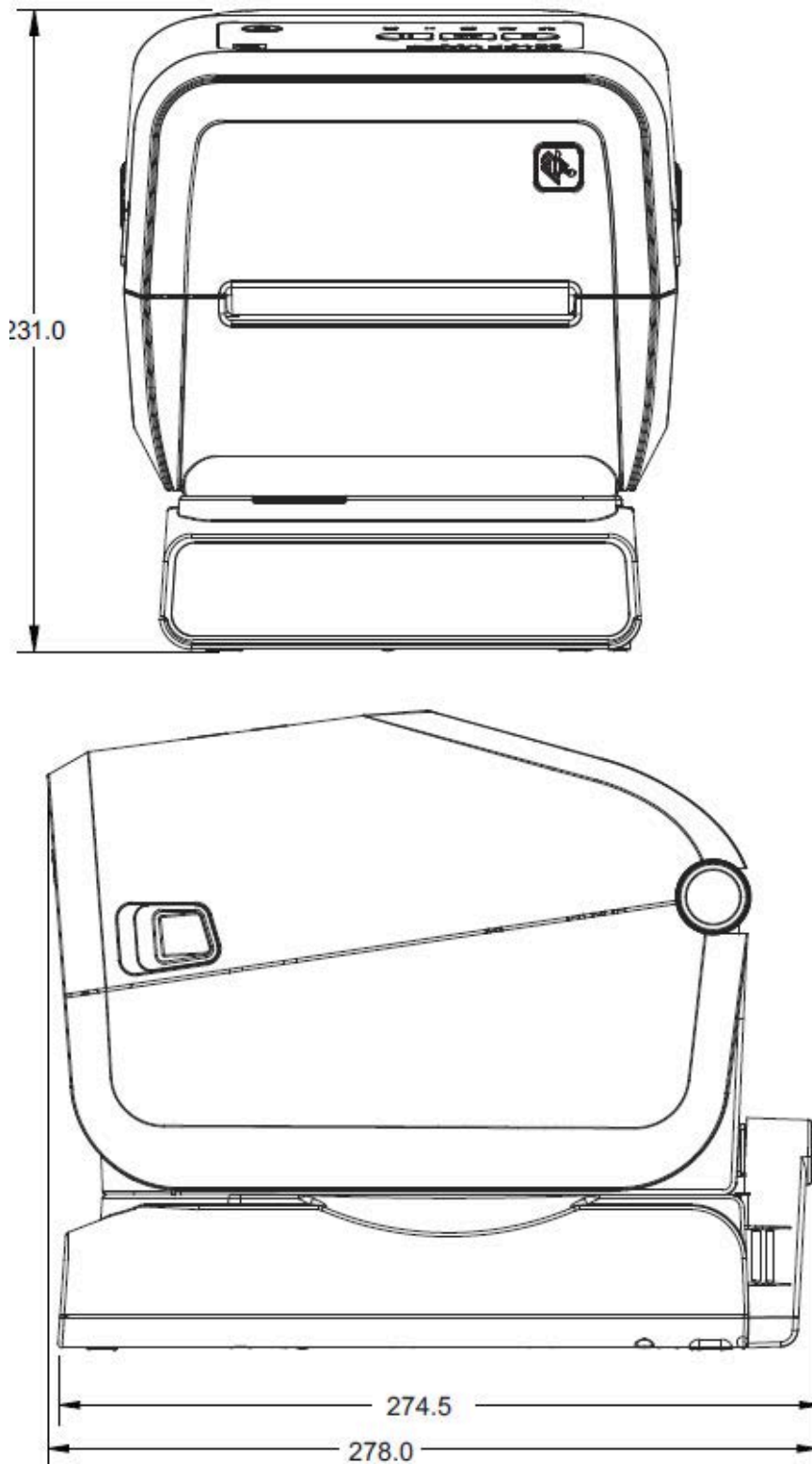
All dimension are in millimeters.

Figure 23 Ribbon Cartridge Thermal Transfer Printer with Attached Power Supply Base (open)



All dimension are in millimeters.

Figure 24 Ribbon Cartridge Thermal Transfer Printer with Attached Battery Base and Battery



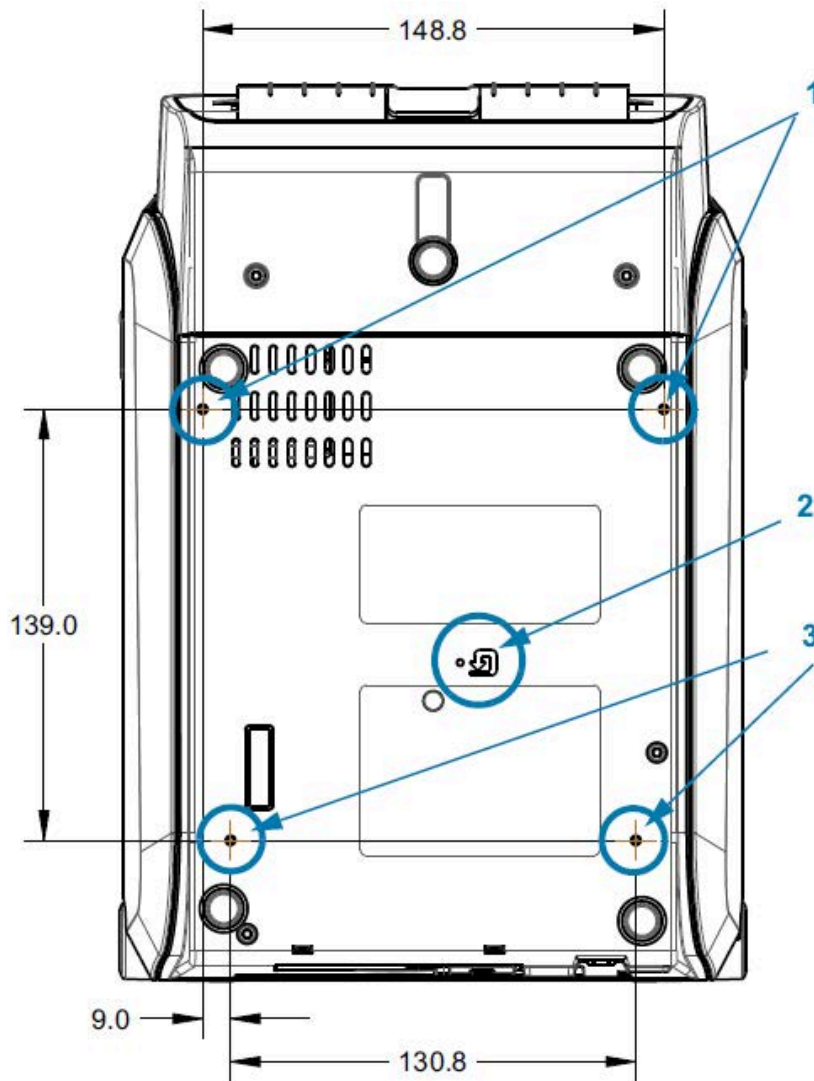
All dimension are in millimeters. For mounting, use M3 thread-forming screws with maximum hole depth of 6 mm into the printer body.

Dimensions



CAUTION: Do not remove the rubber feet or the printer can overheat.

Figure 25 Ribbon Cartridge Thermal Transfer Printer - Mounting Specifications

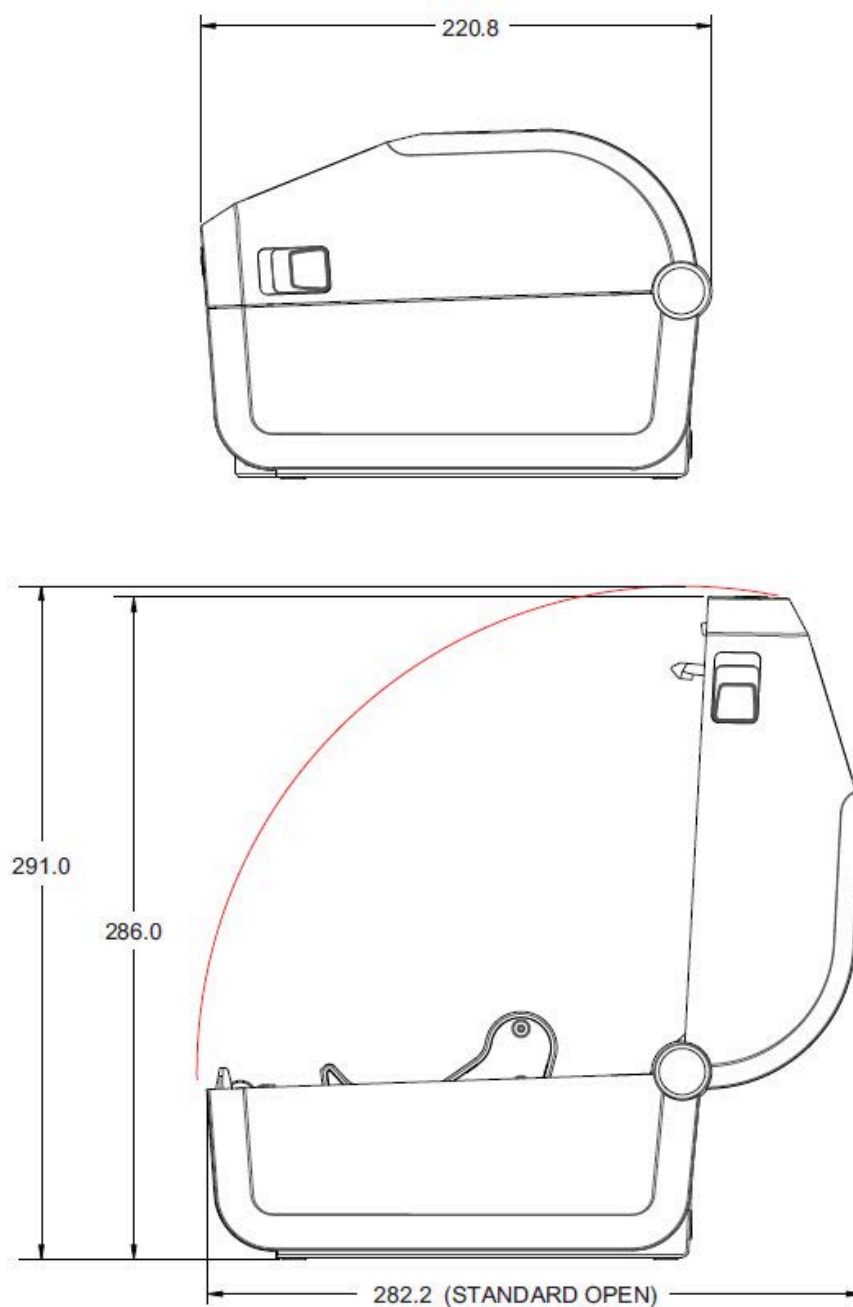


1	Mounting holes
2	Hardware reset access (provide 20-25 mm hole in mounting plate or surface)
3	Mounting holes

ZD620 / ZD420 Dimensions – Direct Thermal Models

All dimensions are in millimeters.

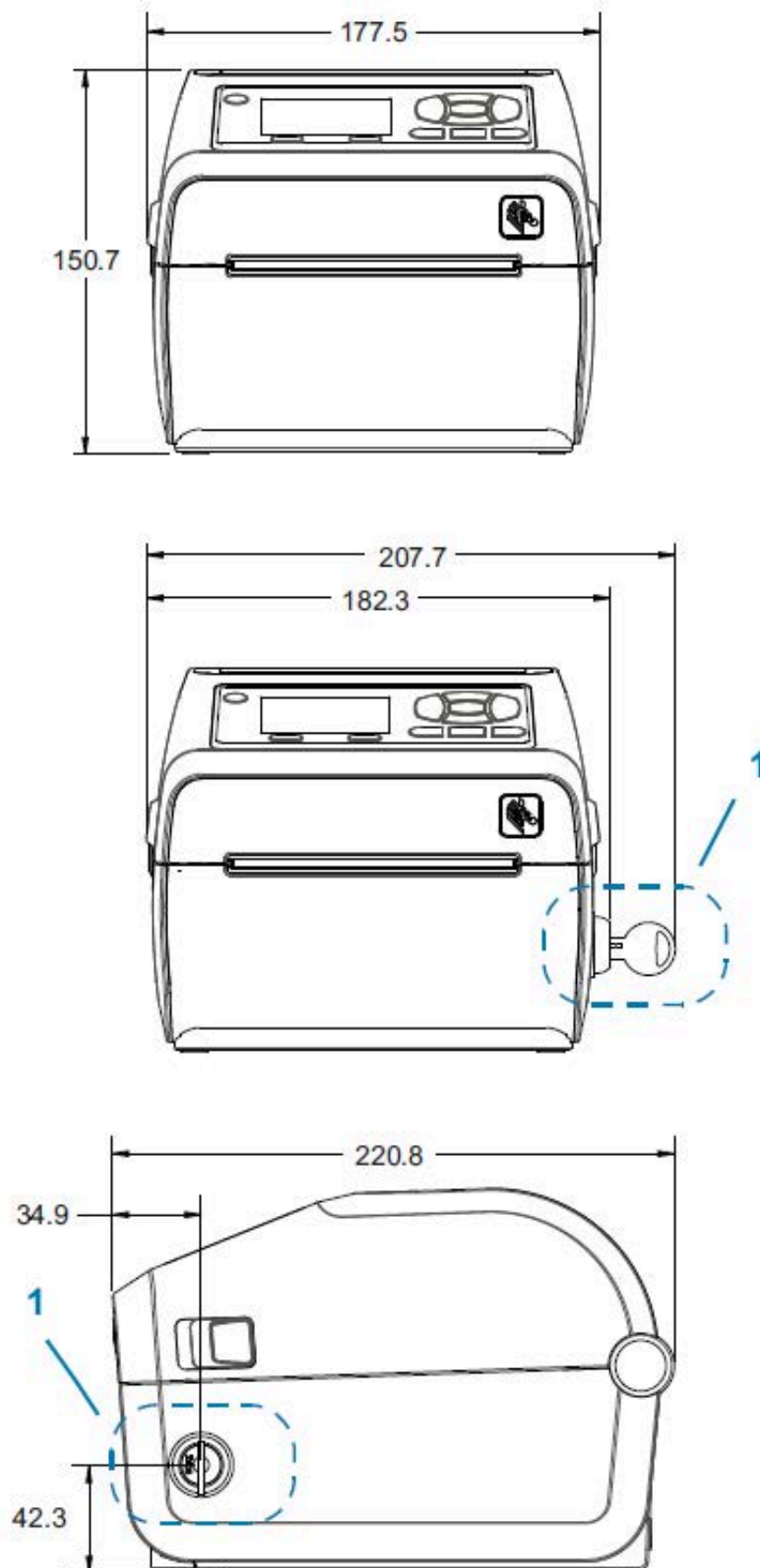
Figure 26 Standard Direct Thermal Printer



All dimensions are in millimeters.

Dimensions

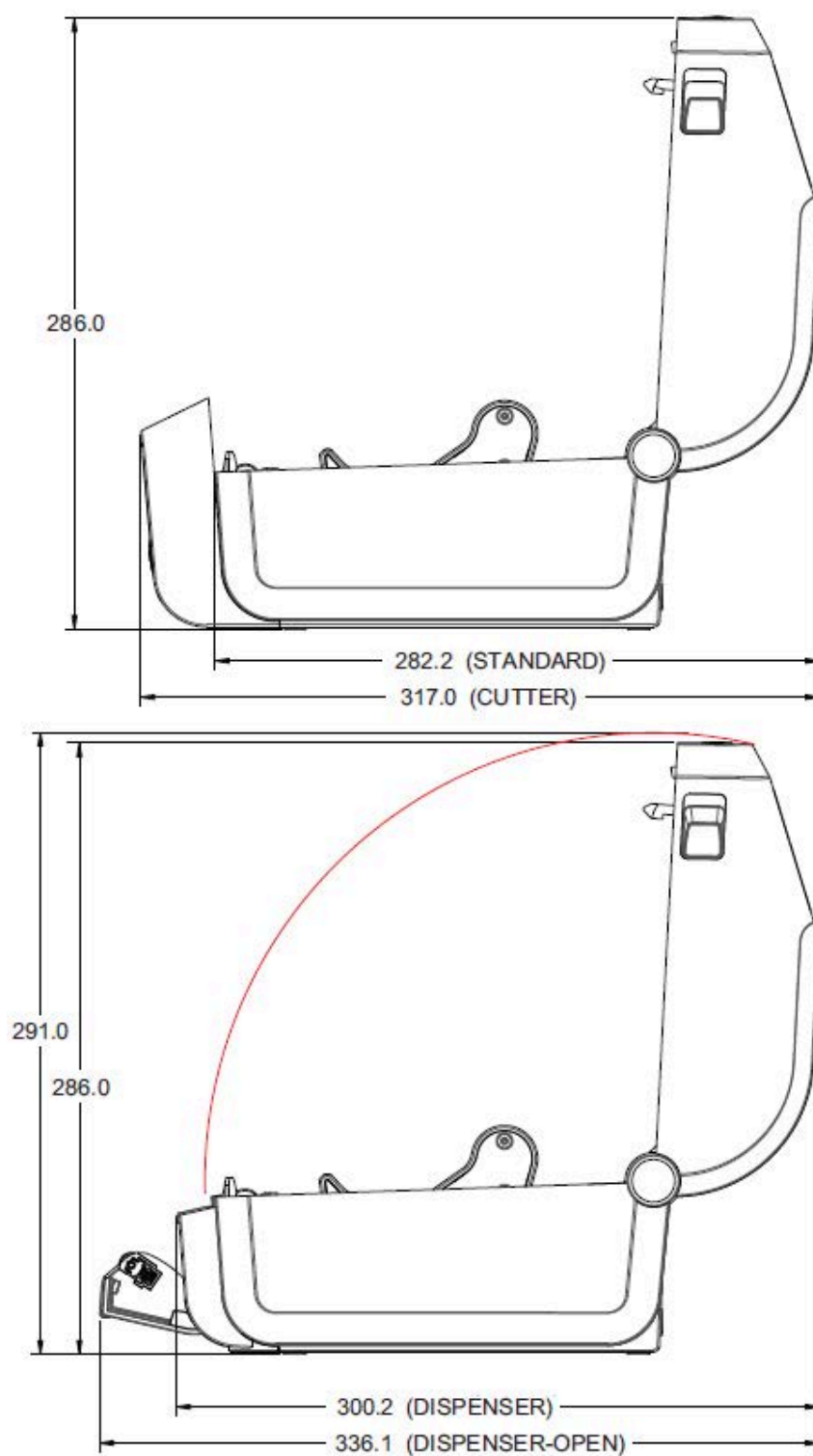
Figure 27 Standard Direct Thermal Printer with Optional: Locking Media Cabinet Lock and Key (1)



Dimensions

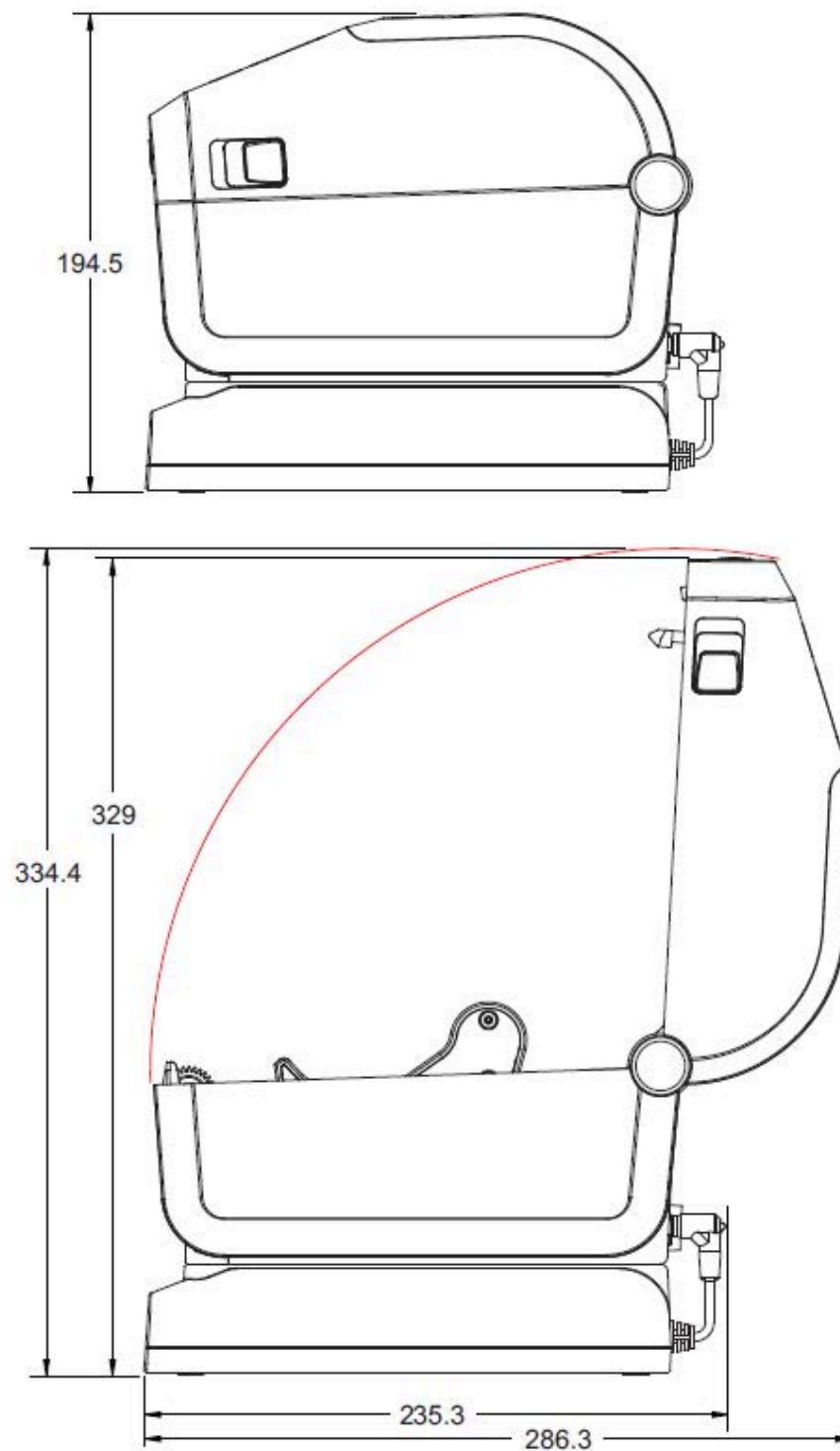
All dimensions are in millimeters.

Figure 28 Direct Thermal Printer – Standard, and Cutter and Dispenser Options



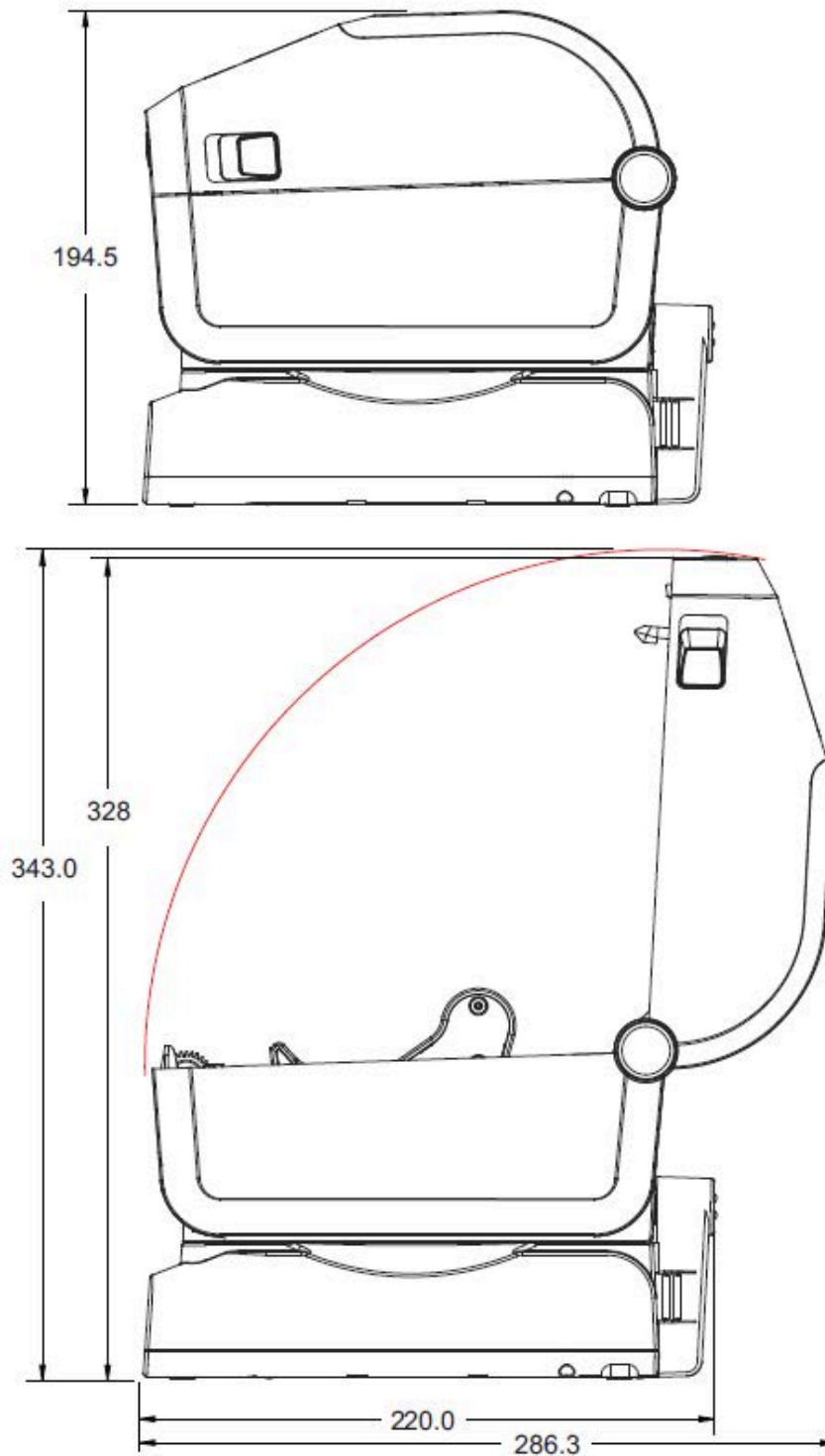
All dimensions are in millimeters.

Figure 29 Direct Thermal Printer with Attached Power Supply Base



All dimensions are in millimeters.

Figure 30 Direct Thermal Printer with Attached Battery Base and Battery

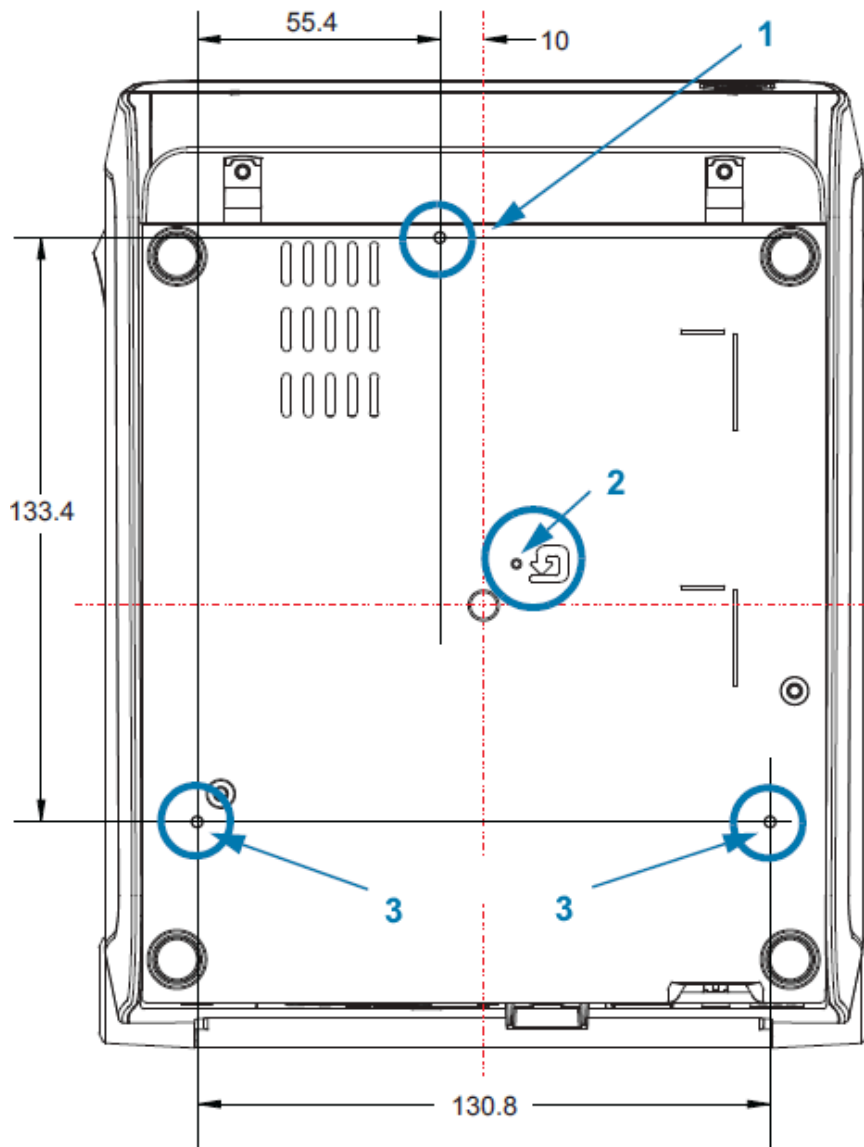


Dimensions are in millimeters. For mounting, use M3 thread forming screws with maximum hole depth of 6 mm into the printer body.



CAUTION: Do not remove the rubber feet or the printer can overheat.

Figure 31 Direct Thermal Printer - Mounting Specifications



1	Mounting holes
2	Hardware reset access (provide 20-25 mm hole in mounting plate or surface)
3	Mounting holes

Media

This section provides a simple media overview for your printer.

Types of Thermal Media



IMPORTANT: Zebra strongly recommends the use of Zebra-brand supplies in order to ensure consistent 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 prevent premature printhead wear.

To purchase supplies, go to zebra.com/supplies.

Your printer can use various types of media:

- Standard media—Most standard (non-continuous) media uses an adhesive backing that sticks individual labels or a continuous length of labels to a liner.
- Continuous roll media—Most continuous roll media is direct thermal media (similar to fax paper) and is used for receipt or ticket style printing.
- Tag stock—Tags are usually made from a heavy paper (up to 0.19mm or 0.0075 in. thick). Tag stock does not have adhesive or a liner, and it is typically perforated between tags.

Determining Thermal Media Types

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 media scratch test, scratch the print surface of the media with a fingernail or pen cap. Press firmly and quickly while dragging it across the media surface.



NOTE: Direct thermal media is chemically treated to print (expose) when heat is applied. This method of testing the media uses friction heat to help identify the media.

Did a black mark appear on the media?

If a black mark...	The media print mode is...
appears...	Direct Thermal. Your printer supports this media. You do NOT have to load ribbon.
does not appear...	Thermal Transfer. A ribbon is required. You will need to load ribbon.

Various Types of Roll and Fanfold Media

The printer typically uses roll media, but you can use fanfold or other continuous media too. Use the correct media for the type of printing you require. You must use direct thermal media.



IMPORTANT: Zebra strongly recommends 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 prevent premature printhead wear. To purchase supplies, go to zebra.com/supplies.

Use the following table to identify the type of media to use to print labels.

Table 23 Types of Media Roll and Fanfold Media

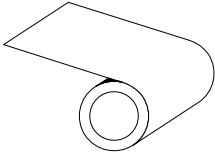
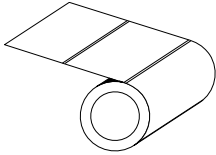
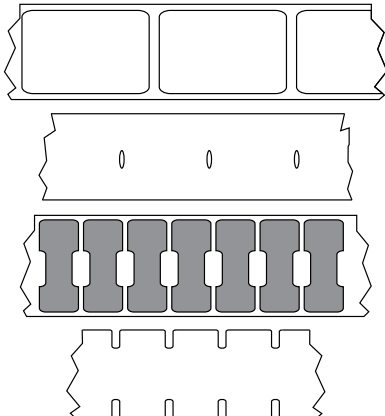
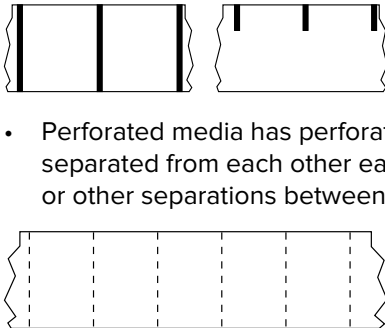
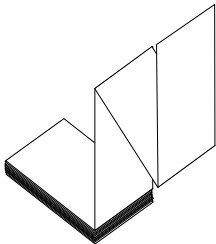
Media Type	Description
Continuous Roll Media 	Roll media is wound on a core that can be 12.7 mm to 38.1 mm (0.5 in. to 1.5 in.) in diameter. Continuous roll media does not have gaps, holes, notches, or black marks to indicate label separations. This allows the image to be printed anywhere on the label. A cutter can be used to cut apart individual labels. With continuous media, use the transmissive (gap) sensor so the printer can detect when the media runs out.

Table 23 Types of Media Roll and Fanfold Media (Continued)

Media Type	Description
Non-continuous Roll Media 	Roll media is wound on a core that can be 12.7 mm to 38.1 mm (0.5 in. to 1.5 in.) in diameter. Labels have adhesive backing that sticks them to a liner, and they are separated by gaps, holes, notches, or black marks. Tags are separated by perforations. Individual labels are separated by one or more of the following methods: • Web media separates labels by gaps, holes, or notches.  • Black mark media uses pre-printed black marks on the backside of the media to indicate label separations. • Perforated media has perforations that allow the labels or tags to be separated from each other easily. The media may also have black marks or other separations between labels or tags. 
Non-continuous Fanfold Media 	Fanfold media is folded in a zigzag pattern. Fanfold media can have the same label separations as non-continuous roll media. The separations would fall on or near the folds.

General Media and Print Specifications

The printer has a wide variety of media and print handling variations. The range of basic media support is specified here.

- Direct Thermal max. media width: 108 mm (4.25 in.)
- Thermal Transfer max. media width: 118 mm (4.65 in.)
- All Printers min. media width: 15 mm (0.585 in.)
- Media length:
 - Max.: 990 mm (39 in.)
 - Tear Off or Label min.: 6.35 mm (0.25 in.)
 - Peel min.: 12.7 mm (0.50 in.)
 - Cutter min.: 25.4 mm (1.0 in.)
- Media thickness:
 - All requirements min.: 0.06 mm (0.0024 in.)
 - All requirements max.: 0.1905 mm (0.0075 in.)
- Media Roll Outer Diameter (O.D.) max.: 127 mm (5.0 in.)
- Media Roll Core Inner Diameter (I.D.):
 - Standard roll configuration: 12.7 mm (0.5 in.) I.D.
 - Standard roll configuration: 25.4 mm (1 in.) I.D.
 - With optional media roll adapter:
 - 38.1 mm (1.5 in.) I.D.
 - 50.8 mm (2.0 in.) I.D.
 - 76.2 mm (3.0 in.) I.D.
- Ribbon Rolls – 74 meter
 - Ribbon length: 74 m (243 ft.)
 - Ribbon width max.: 110 mm (4.33 in.)
 - Ribbon width min.: 33 mm (1.3 in.)



NOTE: Transfer ribbon should always cover the entire width of the media (and liner) to prevent damaging the printhead.

- Ribbon Core I.D.: 12.7 mm (0.5 in.)
- Wax, Wax/Resin, and Resin transfer materials

- Ribbon Rolls – 300 meter
 - Ribbon length: 300 m (984 ft.)
 - Ribbon width max.: 110 mm (4.33 in.)
 - Ribbon width min.: 33 mm (1.3 in.)



NOTE: Transfer ribbon should always cover the entire width of the media (and liner) to prevent damaging the printhead.

- Ribbon core I.D.: 12.7 mm (0.5 in.)
 - Wax, Wax/Resin, and Resin transfer materials
- ZD420 Ribbon Cartridges
 - Ribbon length: 74 m (243 ft.)
 - Ribbon width max.: 110 mm (4.33 in.)
 - Ribbon width min.: 33 mm (1.3 in.)



NOTE: Transfer ribbon should always cover the entire width of the media (and liner) to prevent damaging the printhead.

- Colors available in black (Wax, Wax Resin, and Resin transfer materials)
- Dot pitch:
 - 203 dpi: 0.125mm (0.0049 in.)
 - 300 dpi: 0.085mm (0.0033 in.)
- Barcode modulus x-dim:
 - 203 dpi: 0.005 in. – 0.050 in.)
 - 300 dpi: 0.00327 in. – 0.03267 in.

Label Dispenser (Peeler)

The printer supports a field-installed label dispense option with a label-taken sensor for batch processing of labels.

- Paper thickness:
 - Min.: 0.06 mm (0.0024 in.)
 - Max.: 0.1905 mm (0.0075 in.)
- Media width:
 - Min.: 15 mm (0.585 in.)
 - Thermal Transfer printers max.: 118 mm (4.65 in.)
 - Direct Thermal printers max.: 108 mm (4.25 in.)
- Label length:
 - All printers max. (theoretical): 990 mm (39 in.)
 - Thermal Transfer printers max. (tested): 279.4 mm (11 in.)
 - Direct Thermal printers max. (tested): 330 mm (13 in.)
 - All printers min.: 12.7 mm (0.5 in.)

Standard (Media) Cutter

The printer supports a field-installed media cutter option for full-width cutting of label liner, tag or receipt media.

- A medium-duty cutter for cutting label liner and light tag media (LINER/TAG). Do not cut through labels, adhesive, or embedded circuitry.
- Paper thickness:
 - Min.: 0.06 mm (0.0024 in.)
 - Max.: 0.1905 mm (0.0075 in.)
- Cut width:
 - Min.: 15 mm (0.585 in.)
 - Thermal Transfer printers max.: 118 mm (4.65 in.)
 - Direct Thermal printers max.: 109 mm (4.29 in.)
- Min. distance between cuts (label length): 25.4 mm (1 in.)
 - Cutting shorter media lengths between the cuts may cause the cutter to jam or error.



NOTE: By design, the cutter is self-cleaning and does not require preventive maintenance of the internal cutter mechanism. See [Cleaning the Cutter Option](#) on page 208 and [Cleaning the Media Path](#) on page 204 to maintain optimal linerless media cut operation.

Linerless (Media) Cutter – Direct Thermal Only

The printer supports a field installed media cutter option for full width cutting of linerless media.

- A full-width linerless media cutter (LINERLESS CUT).
- Paper thickness:
 - Min. 0.06 mm (0.0024 in.)
 - Max.: 0.1905 mm (0.0075 in.)
- Cut width:
 - Min.: 15 mm (0.585 in.)
 - Max.: 118 mm (4.65 in.)
- Min. distance between cuts (label length): 25.4 mm (1 in.)



NOTE: Cutting shorter media lengths between the cuts may cause the cutter to jam or error.



NOTE: By design, the cutter is self-cleaning and does not require preventive maintenance of the internal cutter mechanism. See [Cleaning the Cutter Option](#) on page 208, [Cleaning and Replacing the Platen](#) on page 213 and [Cleaning the Media Path](#) on page 204 to maintain optimal linerless media cut operation.

ZPL Configuration

This section provides an overview of managing printer configuration, the Configuring Status Report, and Printer and Memory Printouts.

Managing the ZPL Printer Configuration

The ZPL printer is designed to allow you to change printer settings dynamically for fast first label out printing. Printer parameters that are persistent will be retained for future formats to use. Those settings will remain in effect until they are changed by subsequent commands, the printer is reset, power is cycled, or when you restore a parameter that has a factory default by resetting the printer to its factory defaults.

The ZPL Configuration Update command `^JU` saves and restores printer configurations to initialize (or re-initialize) the printer with pre-configured settings.

- To keep settings after a power cycle or printer reset, a `^JUS` can be sent to the printer to save all current persistent settings.
- The values are recalled with a `^JUR` command to restore the last saved values to the printer.

ZPL stores all parameters at once with a single command mentioned above. The legacy EPL programming language (supported by this printer) changes and saves individual commands immediately. Most printer settings are shared between ZPL and EPL. For example, changing the speed setting with EPL will also change the speed set for ZPL operations. The changed EPL setting will persist even after a power cycle or reset issued by either printer language.

A printer Configuration Report is available to you as a reference. It lists operating parameters, sensor settings and printer status, and can be printed as described in [Test Printing with the Configuration Report](#) on page 131. The Zebra Setup Utility and the ZebraDesigner Windows driver also print this report and other printer reports to help you manage your printer.

ZPL Printer Configuration Format

You can manage more than one printer easily by creating a printer configuration programming file to send to all of them. Alternatively, you can use ZebraNet Bridge to clone a printer's setup.

The basic structure of a ZPL programming configuration file is as follows:

<code>^XA</code>	Start Format Command
------------------	----------------------

	Format commands are case sensitive. (a) General print and command settings (b) Media handling and behaviors Media print size ^JUS command to save
^XZ	End Format Command

See the ZPL Programming Guide and the Configuration Setting to Command Cross-reference to create a programming file using the appropriate commands you need for the task at hand.

Zebra Setup Utilities (ZSU) can be used to send programming files to the printer. Windows Notepad (text editor) can be used to create programming files.

Configuration Setting to Command Cross-reference

The Printer Configuration Report, shown below, provides a listing of a majority of the configurations settings that can be set by ZPL command.

PRINTER CONFIGURATION	
Zebra Technologies ZTC ZD410-300dpi ZPL 50J153200130	
+20.0.....	DARKNESS
LOW.....	DARKNESS SWITCH
4.0 IPS.....	PRINT SPEED
+000.....	TEAR OFF
TEAR OFF.....	PRINT MODE
MARK.....	MEDIA TYPE
REFLECTIVE.....	SENSOR SELECT
640.....	PRINT WIDTH
1104.....	LABEL LENGTH
39.0IN 988MM.....	MAXIMUM LENGTH
MAINT. OFF.....	EARLY WARNING
NOT CONNECTED.....	USB COMM.
AUTO.....	SER COMM. MODE
9600.....	BAUD
8 BITS.....	DATA BITS
NONE.....	PARITY
XON/XOFF.....	HOST HANDSHAKE
NONE.....	PROTOCOL
NORMAL MODE.....	COMMUNICATIONS
<~> 7EH.....	CONTROL PREFIX
<^> 5EH.....	FORMAT PREFIX
<, > 2CH.....	DELIMITER CHAR
ZPL II.....	ZPL MODE
INACTIVE.....	COMMAND OVERRIDE
NO MOTION.....	MEDIA POWER UP
FEED.....	HEAD CLOSE
DEFAULT.....	BACKFEED
+000.....	LABEL TOP
+0000.....	LEFT POSITION
DISABLED.....	REPRINT MODE
042.....	WEB SENSOR
096.....	MEDIA SENSOR
128.....	TAKE LABEL
070.....	MARK SENSOR
004.....	MARK MED SENSOR
000.....	TRANS GAIN
100.....	TRANS LED
066.....	MARK GAIN
058.....	MARK LED
DPCSWFXM.....	MODES ENABLED
.....	MODES DISABLED
640 12/MM FULL.....	RESOLUTION
3.0.....	LINK-OS VERSION
V77.19.142 <-	FIRMWARE
1.3.....	XML SCHEMA
6.5.0 0.515.....	HARDWARE ID
8192k.....R:	RAM
65536k.....E:	ONBOARD FLASH
NONE.....	FORMAT CONVERT
ENABLED.....	IDLE DISPLAY
01/01/70.....	RTC DATE
01:11.....	RTC TIME
DISABLED.....	ZBI
2.1.....	ZBI VERSION
READY.....	ZBI STATUS
312 LABELS.....	NONRESET CNTR
312 LABELS.....	RESET CNTR1
312 LABELS.....	RESET CNTR2
1,593 IN.....	NONRESET CNTR
1,593 IN.....	RESET CNTR1
1,593 IN.....	RESET CNTR2
4,047 CM.....	NONRESET CNTR
4,047 CM.....	RESET CNTR1
4,047 CM.....	RESET CNTR2
EMPTY.....	SLOT 1
0.....	MASS STORAGE COUNT
0.....	HID COUNT
OFF.....	USB HOST LOCK OUT
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

The sensor settings shown in this image, for example, are used for service purposes.

Table 24 ZPL Commands and Configuration Report Callout Cross-Reference

Command	Listing Name	Default (or description)
^SD	DARKNESS	10.0
—	DARKNESS SWITCH	LOW (Default), MEDIUM, or HIGH
^PR	PRINT SPEED	152 mm/s / 6 ips (max.) - 203 dpi 102 mm/s / 4 IPS (max.) - 300 dpi
^TA	TEAR OFF	+000
^MN	MEDIA TYPE	GAP/NOTCH
	SENSOR SELECT	AUTO (^MNA - Auto-Detect)
^MT	PRINT METHOD	THERMAL-TRANS or DIRECT-THERMAL
^PW	PRINT WIDTH	448 (dots for 203 dpi) or 640(dots for 300 dpi)
^LL	LABEL LENGTH	1225 (dots) (dynamically updated while printing)
^ML	MAXIMUM LENGTH	989 mm (39.0 in.)
—	USB COMM.	(Connection Status: Connected / Not Connected)
^SCa	BAUD	9600
^SC, b	DATA BITS	8 BITS
^SC, , c	PARITY	NONE
^SC, , , , e	HOST HANDSHAKE	AUTO
^SC, , , , , f	PROTOCOL	NONE
— SGD —**	COMMUNICATIONS	NORMAL MODE
^CT / ~CT	CONTROL CHAR	<~> 7EH
^CC / ~CC	COMMAND CHAR	<^> 5EH
^CD / ~CD	DELIM./CHAR	<, > 2CH
^SZ	ZPL MODE	ZPL II
— SGD —	COMMAND OVERRIDE  NOTE: Not supported with a ZPL command. Uses the Set-Get-Do command listed in the ZPL manual. (See device.command_override.xxxxx in the ZPL Programming Guide.)	INACTIVE
^MFa	MEDIA POWER UP	NO MOTION
^MF, b	HEAD CLOSE	FEED

Table 24 ZPL Commands and Configuration Report Callout Cross-Reference (Continued)

Command	Listing Name	Default (or description)
~JS	BACKFEED	DEFAULT
^LT	LABEL TOP	+000
^^LS	LEFT POSITION	+0000
~JD / ~JE	HEXDUMP	NO (~JE)
	REPRINT MODE	DISABLED

From this point in the Configuration Receipt listing, the printout lists sensor settings and values which can be used to troubleshoot sensor and media operations. These are typically used by Zebra Tech Support to diagnose printer problems.

The configuration settings listed here resume after the TAKE LABEL sensor value. This listing includes commands that are:

- used to generate status information, or
- relate to printer features whose settings are seldom changed from their defaults.

Table 25 ZPL Commands and Configuration Receipt Callout Cross-Reference

Command	Listing Name	Description
^MP	MODES ENABLED	Default: CWF (See ^MP Command)
	MODES DISABLED	(No default set)
^JM	RESOLUTION	Default: 448 8/mm (203 dpi); 640 8/mm (300 dpi)
—	FIRMWARE	Lists ZPL Firmware Version
—	XML SCHEMA	1.3
—	HARDWARE ID	Lists Firmware Boot-block Version
—	LINK-OS VERSION	
—	CONFIGURATION	CUSTOMIZED (after first use)
—	RAM	2104k..... R:
—	ONBOARD FLASH	6144k.....E:
^MU	FORMAT CONVERT	NONE
—	RTC DATE	Date Displayed
—	RTC TIME	Time Displayed
^JI / ~JI	ZBI	DISABLED (Requires key to enable)
—	ZBI VERSION	2.1 (Displayed if installed)
—	ZBI STATUS	READY
^JH ^MA ~R0	LAST CLEANED	X,XXX IN
	HEAD USAGE	X,XXX IN
	TOTAL USAGE	X,XXX IN

Table 25 ZPL Commands and Configuration Receipt Callout Cross-Reference (Continued)

Command	Listing Name	Description
	RESET CNTR1	X,XXX IN
	RESET CNTR2	X,XXX IN
	NONRESET CNTR0 (1, 2)	X,XXX IN
	RESET CNTR1	X,XXX IN
	RESET CNTR2	X,XXX IN
	NONRESET CNTR0 (1, 2)	X,XXX IN
	RESET CNTR1	X,XXX IN
	RESET CNTR2	X,XXX IN
	SLOT1	EMPTY / SERIAL / WIRED
	MASS STORAGE COUNT	0
	HID COUNT	0
	USB HOST LOCK OUT	OFF / ON
—	SERIAL NUMBER	XXXXXXXXXXXX
^JH	EARLY WARNING	MAINT. OFF

The printer can set a command or a group of commands at one (1) time for all receipts or labels that follow. Those settings remain in effect until:

- they are changed by subsequent commands
- the printer is reset, or
- you restore the printer to its factory defaults.

Printer Memory Management and Related Status Reports

To help you manage printer resources, your printer supports a variety of format commands.

Use these commands to:

- manage memory.
- transfer objects (between memory areas, import and export).
- name objects.
- output various printer operating status reports.

These commands are very similar to the old DOS commands such as DIR (directory listing) and DEL (delete file). The most common reports are also part of the Zebra Setup Utility and ZebraDesigner Windows driver.

It is recommended you issue a single command within this type of format (form) for ease of reuse as a maintenance and development tool.

^XA	Start Format command
	A single format command for ease of reuse.

^XZ	End Format command
-----	--------------------

Many of the commands that transfer objects, and manage/report on memory are control commands (~). They need not be within a format (form). They will be processed immediately after they are received by the printer, whether in a format (form) or not.

ZPL Programming for Memory Management

The ZPL programming language has various printer memory locations that are used to run the printer, assemble the print image, and store formats (forms), graphics, fonts, and configuration settings.

- ZPL treats formats (forms), fonts, and graphics similar to the way it treats files. It treats memory locations like disk drives in the DOS operating system environment.
- Memory Object Naming supports up to 16 alphanumeric characters followed by a three alphanumeric-character file extension (for example: 123456789ABCDEF . TTF).



NOTE: Legacy ZPL printers with V60.13 firmware and earlier can use only an 8.3 filename format instead of today's 16.3 filename format.

- Allows moving objects between memory locations and deleting objects.
- Supports DOS directory style file-list reports as printouts or status to the central device or host computer.
- Allows use of wildcards (*) for file access.

ZPL object management and status report commands are listed below.

Command	Name	Description
^WD	Print Directory Label	Prints a list of objects and resident barcodes and fonts in all addressable memory locations.
~WC	Print Configuration Label	Prints a configuration Status Receipt (Label) Same as FEED button mode one-flash routine.
^ID	Object Delete	Deletes objects from printer memory.
^TO	Transfer Object	Used to copy an object or group of objects from one memory area to another.
^CM	Change Memory Letter Designation	Reassigns a letter designation to a printer memory area.
^JB	Initialize Flash memory	Similar effect as formatting a computer hard disk—erases all objects from the specified memory locations B: or E:.
~JB	Reset Optional Memory	Similar effect formatting a computer hard disk—erases all objects from the B: memory (factory option).
~DY	Download Objects	Downloads and installs wide variety of printer usable programming objects: fonts (OpenType and TrueType), graphics, and other object data types. Use ZebraNet Bridge for downloading graphics and fonts in the printer.
~DG	Download Graphic	Downloads an ASCII Hex representation of a graphic image. This is used by ZebraDesigner (label-creation application) for graphics handling.
^FL	Font Linking	Appends secondary TrueType font or fonts to the primary TrueType font to add glyphs (characters).

Command	Name	Description
^LF	List Font Links	Prints a list of the linked fonts.
^CW	Font Identifier	Assigns a single alphanumeric character as an alias to a font stored in memory.



IMPORTANT: Some factory-installed ZPL fonts in your printer cannot be copied, cloned or restored to your printer by reloading or updating firmware.

If these license-restricted ZPL fonts are removed by an explicit ZPL object delete command, they must be repurchased and reinstalled using a font activation and installation utility. EPL fonts do not have this restriction.

Glossary

alphanumeric

Indicating letters, numerals, and characters such as punctuation marks.

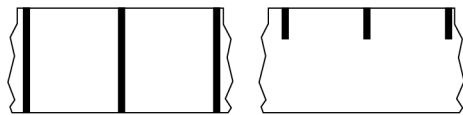
backfeed

When the printer pulls the media and ribbon (if used) backward into the printer so that the beginning of the label to be printed is properly positioned behind the printhead. Backfeed occurs when operating the printer in Tear-Off and Applicator modes.

barcode

A code by which alphanumeric characters can be represented by a series of adjacent stripes of different widths. Many different code schemes exist, such as the universal product code (UPC) or Code 39.

black mark media



Media with registration marks found on the underside of the print media that act as start-of-label indications for the printer. The reflective media sensor is the generally-selected option for use with black mark media.

Contrast this with [continuous media](#) on page 303 or [gap/notch media](#) on page 305.

calibration (of a printer)

A process in which the printer determines some basic information needed to print accurately with a particular [media](#) and [ribbon](#) combination. To do this, the printer feeds some media and ribbon (if used) and senses whether to use the [direct thermal](#) or [thermal transfer](#) print method, along with (if using [non-continuous media](#)) the length of individual labels or tags.

collection method

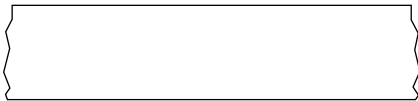
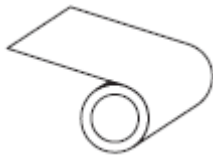
Select a media collection method that is compatible with your printer options. Selections include tear-off, peel-off, cutter, and rewind. The basic media and ribbon loading instructions are the same for all collection methods with some additional steps necessary for using any media collection options.

configuration

The printer configuration is a group of operating parameters specific to the printer application. Some parameters are user selectable, while others are dependent on the installed options and mode of operation. Parameters may be switch selectable, control panel programmable, or downloaded as ZPL II commands. A configuration label listing all the current printer parameters may be printed for reference.

continuous media

Label or tag-stock media that does not have gaps, holes, notches, or black marks to indicate label separations. The media is one long piece of material wound into a roll. This allows the image to be printed anywhere on the label. Sometimes a cutter is used to cut apart individual labels or receipts.



A transmissive (gap) sensor is typically used for the printer to detect when the media runs out.

Contrast this with [black mark media](#) on page 302 or [gap/notch media](#) on page 305.

core diameter

The inside diameter of the cardboard core at the center of a roll of media or ribbon.

diagnostics

Information about which printer functions are not working that is used for troubleshooting printer problems.

die-cut media

A type of label stock that has individual labels stuck to a media liner. The labels may be lined up against each other or separated by a small distance. Typically the material surrounding the labels has been removed. (See [non-continuous media](#) on page 307.)

direct thermal

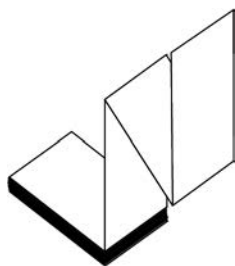
A printing method in which the printhead presses directly against the media. Heating the printhead elements causes a discoloration of the heat-sensitive coating on the media. By selectively heating the printhead elements as the media moves past, an image is printed onto the media. No ribbon is used with this printing method.

Contrast this with [thermal transfer](#) on page 310.

direct thermal media

Media that is coated with a substance that reacts to the application of direct heat from the printhead to produce an image.

fanfold media



Non-continuous media that comes folded in a rectangular stack and folded in a zigzag pattern. Fanfold media is either [gap-notch media](#) or [black mark media](#), meaning it uses black marks or notches to track media format positioning.

Fanfold media can have the same label separations as non-continuous roll media. The separations fall either on or near the folds.

Contrast this with [roll media](#) on page 309.

firmware

This is the term used to specify the printer's operating program. This program is downloaded to the printer from a host computer and stored in [flash memory](#). Each time the printer power is turned on, this operating program starts. This program controls when to feed the media forward or backward and when to print a dot on the label stock.

FLASH memory

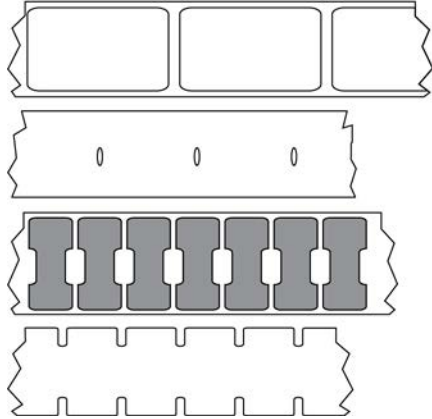
[Non-volatile memory](#) that maintains the stored information intact when power is off. This memory area is used to store the printer's operating program. Can also be used to store optional printer fonts, graphic formats, and complete label formats.

font

A complete set of [alphanumeric](#) characters in one style of type. Examples include CG Times™, CG Triumvirate Bold Condensed™.

gap/notch media

Media that contains a separation, notch, or hole, indicating where one label/printed format ends and the next begins.



Contrast this with [black mark media](#) on page 302 or [continuous media](#) on page 303.

ips (inches-per-second)

The speed at which the label or tag is printed. Many Zebra printers can print from 1 ips to 14 ips.

label

An adhesive-backed piece of paper, plastic, or other material on which information is printed. A non-continuous label has a defined length, as opposed to a continuous label or a receipt which can have a varying length.

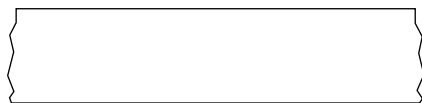
label backing (liner)

The material on which labels are affixed during manufacture and which is discarded or recycled.

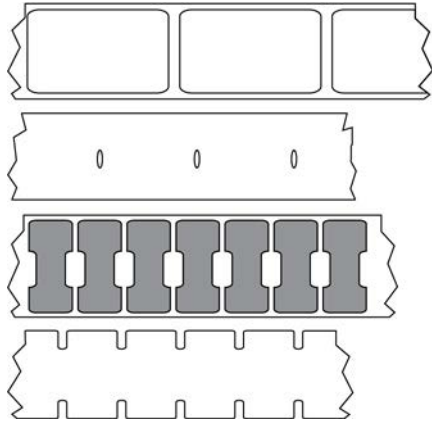
label type

The printer recognizes the following label types.

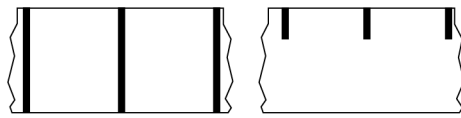
Continuous



Gap/Notch



Mark



void

A space on which printing should have occurred, but did not due to an error condition such as wrinkled ribbon or faulty print elements. A void can cause a printed barcode symbol to be read incorrectly or not at all.

LCD (liquid crystal display)

A backlit display that provides the user with either operating status during normal operation or option menus when configuring the printer to a specific application.

LED (light emitting diode)

Indicators of specific printer status conditions. Each LED is either off, on, or blinking depending on the feature being monitored.

linerless media

Linerless media does not use backing to keep the layers of labels on a roll from sticking to one another. It is wound like a roll of tape, with the sticky side of one layer in contact with the non-sticky surface of the one below it. Individual labels may be separated by perforations, or they can be cut apart. Because there is no liner, more labels can potentially fit on a roll, cutting down the need to change media as often. Linerless media is considered an environmentally-friendly option because no backing is wasted, and the cost per label can be considerably less than that of standard labels.

mark media

See [black mark media](#) on page 302.

media

Material onto which data is printed by the printer. Types of media include: tag stock, die-cut labels, continuous labels (with and without media liner), non-continuous media, fanfold media, and roll media.

media sensor

This sensor is located behind the printhead to detect the presence of media and, for [non-continuous media](#), the position of the web, hole, or notch used to indicate the start of each label.

media supply hangar

The stationary arm that supports the media roll.

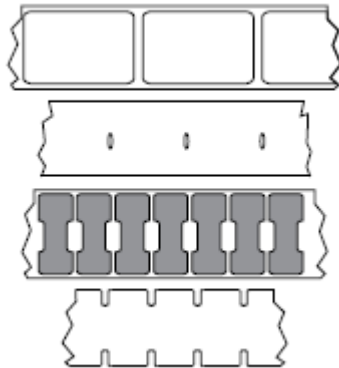
non-continuous media

Media that contains an indication of where one label/printed format ends and the next one begins. Types of non-continuous media include [gap-notch media](#) and [black mark media](#). (Contrast this with [continuous media](#).)

Non-continuous roll media usually comes in the form of labels with an adhesive backing on a liner. Tags (or tickets) are separated by perforations.

Individual labels or tags are tracked and position-controlled using one of these methods:

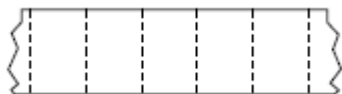
- Web media separates labels by gaps, holes, or notches.



- Black mark media uses pre-printed black marks on the back side of the media to indicate label separations.



- Perforated media has holes—to allow the labels or tags to be separated from each other easily—along with position-control marks, notches, or label gaps.



non-volatile memory

Electronic memory that retains data even when the power to the printer is turned off.

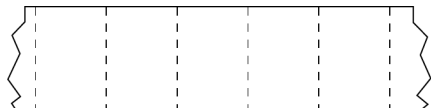
notched media

A type of tag stock containing a cutout area that can be sensed as a start-of-label indicator by the printer. This is typically a heavier, cardboard-like material that is either cut or torn away from the next tag. See [gap/notch media](#) on page 305.

peel-off mode

A mode of operation in which the printer peels a printed label away from the backing and allows the user to remove it before another label is printed. Printing pauses until the label is removed.

perforated media



Media with perforations that allow the labels or tags to be separated from each other easily. The media may also have black marks or other separations between labels or tags.

print speed

The speed at which printing occurs. For thermal transfer printers, this speed is expressed in terms of [inches per second \(ips\)](#).

print type

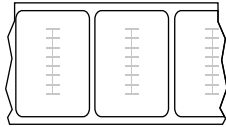
The print type specifies whether the type of media being used requires ribbon to print. Thermal transfer media requires ribbon while direct thermal media does not.

printhead wear

The degradation of the surface of the printhead and/or the print elements over time. Heat and abrasion can cause printhead wear. Therefore, to maximize the life of the printhead, use the lowest print darkness setting (sometimes called burn temperature or head temperature) and the lowest printhead pressure

necessary to produce good print quality. In the thermal transfer printing method, use ribbon that is as wide or wider than the media to protect the printhead from the rough media surface.

Radio frequency identification (RFID) "smart" media



Each RFID label has an RFID transponder (sometimes called an "inlay"), made of a chip and an antenna, embedded between the label and the liner. The shape of the transponder varies by manufacturer and is visible through the label. All "smart" labels have memory that can be read, and many have memory that can be encoded.

RFID media can be used in a printer that is equipped with an RFID reader/encoder. RFID labels are made from the same materials and adhesives as non-RFID labels.

receipt

A receipt is a variable length printout. One example of a receipt is in retail stores, where each purchased item occupies a separate line on the printout. Therefore, the more items purchased, the longer the receipt.

registration

Alignment of printing with respect to the top (vertical) or sides (horizontal) of a label or tag.

ribbon

Ribbon is a thin film that is coated on one side with wax, resin, or wax resin (usually called ink), which is transferred to the media during the [thermal transfer](#) process. Ink is transferred onto the media when heated by the small elements within the printhead.

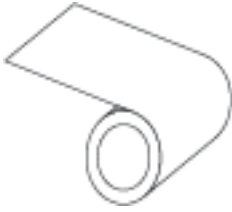
Ribbon is only used with the thermal transfer print method. [Direct thermal media](#) does not use ribbon. When ribbon is used, it must be as wide as or wider than the media being used. If the ribbon is narrower than the media, areas of the printhead are unprotected and subject to premature wear. Zebra ribbons have a coating on the back that protects the printhead from wear.

ribbon wrinkle

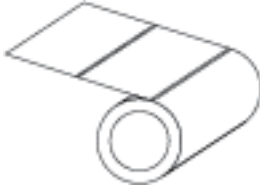
A wrinkling of the ribbon caused by improper alignment or improper printhead pressure. This wrinkle can cause voids in the print and/or the used ribbon to rewind unevenly. This condition should be corrected by performing adjustment procedures.

roll media

Media that comes supplied rolled onto a core (usually cardboard). It can be continuous (no separations between labels)



or non-continuous (some type of separation between labels).



Contrast this with [fanfold media](#) on page 304.

supplies

A general term for media and ribbon.

symbology

The term generally used when referring to a barcode.

tag stock

A type of media having no adhesive backing but featuring a hole or notch by which the tag can be hung on something. Tags are usually made of cardboard or other durable material and are typically perforated between tags. Tag stock can come on rolls or in a fanfold stack. (See [gap/notch media](#) on page 305.)

tear-off mode

A mode of operation in which the user tears the label or tag stock away from the remaining media by hand.

thermal transfer

A printing method in which the printhead presses an ink or resin coated ribbon against the media. Heating the printhead elements causes the ink or resin to transfer onto the media. By selectively heating the printhead elements as the media and ribbon move past, an image is printed onto the media.

Contrast this with [direct thermal](#) on page 304.

