

ZD620 and ZD420

Link-OS 4 inch Desktop Printers



User's Guide



ZEBRA

Copyright ZIH Corp. and/or its affiliates. All rights reserved. ZEBRA and the stylized Zebra head are trademarks of ZIH Corp., registered in many jurisdictions worldwide. All other trademarks are the property of their respective owners.

Information in this document is subject to change without notice. The software described in this document is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of those agreements.

For further information regarding legal and proprietary statements, please go to:

COPYRIGHTS: www.zebra.com/copyright

WARRANTY: www.zebra.com/warranty

END USER LICENSE AGREEMENT: www.zebra.com/eula

SOFTWARE: www.zebra.com/linkoslegal

Terms of Use

Proprietary Statement

This manual contains proprietary information of Zebra Technologies Corporation and its subsidiaries ("Zebra Technologies"). It is intended solely for the information and use of parties operating and maintaining the equipment described herein. Such proprietary information may not be used, reproduced, or disclosed to any other parties for any other purpose without the express, written permission of Zebra Technologies.

Product Improvements

Continuous improvement of products is a policy of Zebra Technologies. All specifications and designs are subject to change without notice.

Liability Disclaimer

Zebra Technologies takes steps to ensure that its published Engineering specifications and manuals are correct; however, errors do occur. Zebra Technologies reserves the right to correct any such errors and disclaims liability resulting therefrom.

Limitation of Liability

In no event shall Zebra Technologies or anyone else involved in the creation, production, or delivery of the accompanying product (including hardware and software) be liable for any damages whatsoever (including, without limitation, consequential damages including loss of business profits, business interruption, or loss of business information) arising out of the use of, the results of use of, or inability to use such product, even if Zebra Technologies has been advised of the possibility of such damages. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Publication Date

August 2018

About

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:

- 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

See ZebraLink, Zebra Link-OS, and Zatar from this Online link: www.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. See the descriptions of the Zebra OneCare service and support options available for your printers Online at this link: www.zebra.com/zebraonecare

Using This Document and Its Internally Attached Files

This document is best used with Adobe Reader or Adobe DC. This user's guide includes attached User Programming Example Files for sample printer operations.

Go to the Adobe Web site to load Adobe Reader (for free at the release time of this publication): www.adobe.com

Document Conventions

The following graphic icons are used throughout the documentation set. These icons and their associated meanings are described below.



Caution • If the precaution is not heeded, the user could receive minor or moderate injury.



Eye Injury Caution • If the precaution is not taken, the user's eyes could be damaged. EXAMPLE: Wear protective eyewear when installing or removing E-rings, C-clips, snap rings, springs, and mounting buttons. These are under tension and could fly off.



Electrical Shock Caution • If the precaution is not taken, the user could receive an electrical shock. EXAMPLE: Turn off (O) the printer and disconnect it from the power source before performing the following procedure.



Hot Surface Caution • If the precaution is not taken, the user could be burned. EXAMPLE: The printhead may be hot and could cause sever burns. Allow the printhead to cool.



Product Damage Caution • If the precaution is not taken, the product could be damaged. EXAMPLE: Unplugging the computer without properly shutting it down may corrupt the data on your hard drive.



ESD Caution • If the precaution is not taken, the product electronics could be damaged by an electrostatic discharge. EXAMPLE: Observe proper electrostatic safety precautions when handling static-sensitive components such as circuit boards and printheads.



Important • The text here indicates information that is important for the user to know. EXAMPLE: Run the setup.exe file for the product BEFORE connecting the product to your printer.



Note • The text here indicates information that is supplemental for the user to know and that is not required to complete a task. EXAMPLE: Refer to zebra.com for complete information on product warranties.

Contents

Terms of Use	2
Proprietary Statement	2
Product Improvements	2
Liability Disclaimer	2
Limitation of Liability	2
Publication Date	2
• About	3
Other Valuable Printer Resources	4
Zebra OneCare Printer Service and Support	4
Using This Document and Its Internally Attached Files	4
Document Conventions	5
• Contents	6
• Introduction	14
Link-OS 4 inch Desktop Thermal Printers	14
Common Desktop Link-OS Printer Features:	15
Link-OS 4 inch Desktop Printer Options:	16
Zebra Label Printing Solution	18
Modes of Printing	18
What's in the Box?	19
Unpack and Inspect the Printer	19

Contents

• Printer Features	21
Printer Features	22
Inside the ZD620 Dual Capacity Ribbon Roll Printer	23
Inside the ZD620 and ZD420 Direct Thermal Printers	25
Inside the ZD420 Ribbon Cartridge Printer	26
Label Dispenser Option (field installable) - All Models	28
Cutter Option (field installable) - All Models	28
Linerless Media Tear-Off Option (Direct Thermal Models Only)	29
Linerless Cutter Option (Direct Thermal Models Only)	29
Identifying Platen Drive Rollers Types	30
Printer Power Supply Options	31
ZD620 Locking Printer Features	33
Zebra Print Touch	34
• Install Hardware Options	35
Field Installable printer Accessories and Options	36
Printer Connectivity Modules	37
Accessing the Connectivity Module Slot	37
Installing the Serial Port Module	38
Installing the Internal Ethernet (LAN) Module	39
Media Handling Options	41
Removing the Standard Bezel	41
Installing the Label Dispenser	42
Installing the Standard Media Cutter	43
Installing the Linerless Media Cutter	44
Installing the Linerless Media 'Tear-Off' Bezel	45
Media Roll Core Size Adapters	46
Print Resolution Upgrade Kits	48
Installing the Attached Power Supply Base Options	49
Installing the Attached Battery Base Options	51
Installing the Battery into the Attached Power Base	52
User Interface	53
Standard Interface Controls	54
LCD User Interface	57
Meaning of the Indicator Light Patterns	58
Status - Typical Operating Conditions	58
Status - Printhead Operation	60
Status - Bluetooth Low Energy (BTLE) Option	61
Status - Ethernet (LAN) Option	61
Status - Wi-Fi (WLAN) Option	62
Display Controls and Menus	63
Navigating through Menu Display Screens	64
Battery Indicators and Controls	67

• Printer Configuration Menus	68
Adjust Printer Settings	68
User Menu	69
SETTINGS Menu	70
DARKNESS	70
PRINT SPEED	71
MEDIA TYPE	71
PRINT METHOD	72
TEAR OFF	73
PRINT WIDTH	74
PRINT MODE	75
LABEL TOP	76
LEFT POSITION	77
REPRINT MODE	78
LABEL LENGTH MAX	79
TOOLS Menu	80
PRINT INFORMATION	80
IDLE DISPLAY	82
POWER UP ACTION	83
HEAD CLOSE ACTION	84
LOAD DEFAULTS	85
MEDIA/RIBBON CAL	86
DIAGNOSTIC MODE	86
CONFIG INFO TO USB	87
ZBI ENABLED?	87
RUN ZBI PROGRAM	88
STOP ZBI PROGRAM	89
PRINT USB FILE	90
COPY USB FILE TO E:	91
STORE E: FILE TO USB	92
PRINT STATION	93
PASSWORD PROTECT	94
PRINT TEST FORMAT	94

Contents

NETWORK	95
ACTIVE PRINT SERVER	95
PRIMARY NETWORK	95
WIRED IP ADDRESS	96
WIRED SUBNET MASK	96
WIRED GATEWAY	97
WIRED IP PROTOCOL	98
WIRED MAC ADDRESS	99
WLAN IP ADDRESS	99
WLAN SUBNET MASK	100
WLAN GATEWAY	100
WLAN IP PROTOCOL	101
WLAN MAC ADDRESS	101
ESSID	102
CHANNEL	102
SIGNAL	103
IP PORT	103
IP ALTERNATE PORT	104
RESET NETWORK	104
VISIBILITY AGENT	105
BATTERY Menu	106
BATTERY STATUS	106
LANGUAGE Menu	107
LANGUAGE	107
COMMAND LANGUAGE	108
COMMAND CHAR	108
CONTROL CHAR	109
DELIMITER CHAR	110
ZPL MODE	111
VIRTUAL DEVICE	111
SENSORS	112
SENSOR TYPE	112
LABEL SENSOR	112
TAKE LABEL	113
PORTS	114
BAUD RATE	114
DATA BITS	114
PARITY	115
HOST HANDSHAKE	115
WML	116

Contents

BLUETOOTH	117
BLUETOOTH ADDRESS	117
MODE	117
DISCOVERY	118
CONNECTED	118
BT SPEC VERSION	119
MIN SECURITY MODE	119
• Setup	120
Printer Setup Overview	120
Select a Location for the Printer	121
Install Printer Options and Connectivity Modules	121
Attaching Power	122
Getting Ready to Print	123
Preparing and Handling Media	123
Media Storage Tips	123
Loading Roll Media	124
Setting Media Sensing by Media type	124
Instructions for media loading:	125
Loading Thermal Transfer Roll Ribbon	131
Loading Zebra Transfer Roll Ribbon	132
Loading the ZD420 Ribbon Cartridge	142
Run a SmartCal Media Calibration	143
SmartCal Procedure	143
Test Printing with the Configuration Report	144
Detecting a Media Out Condition	145
Detecting a Ribbon Out Condition	146
Connecting your Printer to a Computer	147
Interface Cable Requirements	147
Wi-Fi and Bluetooth Classic Wireless Connectivity Option	151
• Setup for Windows® OS	152
Windows to Printer Communication Setup (Overview)	152
Pre-install Windows® Printer Drivers	153
Setting Up the Wi-Fi Print Server Option	153
Configure Using the ZebraNet Bridge's Connectivity Wizard	154
Using a Configuration Script	160
Bluetooth Option Configuration	162
Connecting to a Windows XP® SP2 Master Device	164
Connecting to a Windows Vista® SP2 or Windows 7® Master Device	165
Connecting the Printer to a Windows 8	168
Connecting the Printer to a Windows 10 PC	169
After Your Printer is Connected	172

- **Print Operations** **174**
 - Thermal Printing174
 - Determining Your Printer’s Configuration Settings174
 - Select a Print Mode175
 - Adjusting the Print Quality175
 - Darkness Control176
 - Adjusting the Print Width177
 - Replacing Supplies while Using the Printer177
 - Printing on Fan-Fold Media178
 - Printing with Externally Mounted Roll Media180
 - Externally Mounted Roll Media Considerations:.....180
 - Using the Label Dispenser Option181
 - Using the Linerless Options185
 - Linerless Printing185
 - Sending Files to the Printer186
 - Ribbon Cartridge Programming Commands186
 - Printing with the Attached Battery Base and Battery Option187
 - Printer Fonts188
 - Identifying Fonts in Your Printer188
 - Localizing the Printer with Code Pages188
 - Asian fonts and Other Large Font Sets189
 - EPL Line Mode - Direct Thermal Printers only190
 - ZD620 and ZD420 Locking Printer Option190
 - Zebra® ZKDU — Printer Accessory191
 - ZBI 2.0™ — Zebra Basic Interpreter191
 - Setting the Power Failure Recovery Mode Jumper192
- **USB Host Port and Link-OS Usage Examples** **193**
 - USB Host193
 - Using USB Host for Firmware Updates194
 - USB Host and Printer Usage Examples195
 - Items Required for the USB Host Exercises195
 - Files for Completing the Exercises195
 - Exercise 1: Copy Files to a USB Flash Drive and Perform USB Mirror198
 - Exercise 2: Print a Label Format from a USB Flash Drive200
 - Exercise 3: Copy Files to/from a USB Flash Drive201
 - Exercise 4: Enter Data for a Stored File with a USB Keyboard and Print a Label203
 - Using the USB Hosts Port and the NFC Capabilities204
 - Exercise 5: Enter Data for a Stored File with a Smart Device and Print a Label .205

• Maintenance	207
Cleaning	207
Cleaning Supplies	207
Recommended Cleaning Schedule	208
Cleaning the Printhead	210
Media Path Cleaning	213
Sensor Cleaning	218
Platen Cleaning and Replacement	222
Replacing the Printhead	226
ZD620 and ZD420 Direct Thermal	227
ZD620 and ZD420 Thermal Transfer Ribbon Roll	231
ZD420 Thermal Transfer Ribbon Cartridge	236
Updating Printer Firmware	240
Other Printer Maintenance	241
RTC Battery	241
Fuses	241
• Troubleshooting	242
Resolving Alerts and Errors	242
Alert: Printhead Open	242
Alert: Media Out	243
Alert: Ribbon In (ZD420 Cartridge Printer only)	245
Alert: Ribbon Out	246
Alert: Ribbon Low (ZD420 Cartridge Printer only)	247
Alert: CUT ERROR	247
Alert: PRINthead OVER TEMP	248
Alert: PRINthead SHUTDOWN	248
Alert: PRINthead UNDER TEMP	249
Alert: OUT OF MEMORY	250
Resolving Print Issues	251
Issue: General Print Quality Issues	251
Issue: No Print on the Label	252
Issue: Labels Are Distorted in Size or Print Area Start Position Varies	253
Communication Issues	254
Issue: Label Job Sent, No Data Transfer	254
Issue: Label Job Sent, Skips Labels or Prints Bad Content	254
Issue: Label Job Sent, Data Transfers, But No Print	255
Miscellaneous Issues	256
Issue: Settings are Lost or Ignored	256
Issue: Non-continuous labels act as Continuous labels	257
Issue: Printer Locks-Up	257
Issue: Erroneous Ribbon Cartridge Faults	257
Issue: Battery has a Red Indicator	258

• Tools	259
Printer Diagnostics	260
Power-On Self Test	260
SmartCal Media Calibration	260
Configuration Report (CANCEL Self Test)	261
Printer Network (and Bluetooth) Configuration Report	262
Print Quality Report (FEED self test)	263
Reset Printer Factory Defaults (PAUSE + FEED Self Test)	266
Reset Network Factory Defaults (PAUSE + CANCEL Self Test)	266
Reset Button	267
Communication Diagnostics Test	268
Sensor Profile	269
Advanced Mode	271
Manual Media Calibration	271
Manual Print Width Adjustment	272
Manual Print Darkness Adjustment	273
Factory Test Modes	274
Universal Serial Bus (USB) Interface	275
Serial Port Interface	276
Connecting the Printer to a DTE Device	276
Connecting the Printer to a DCE Device	277
ZD620 / ZD420 Thermal Transfer Models	279
ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models	287
ZD620 / ZD420 Direct Thermal Models	295
• Media	301
Types of Thermal Media	302
Determining Thermal Media Types	302
General Media and Print Specifications	303
• ZPL Configuration	307
Managing the ZPL Printer Configuration	307
Configuration Setting to Command Cross-reference	309
Printer Memory Management and Related Status Reports	312
ZPL Programming for Memory Management	312

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 document covers the following ZD-series desktop printer models:

- 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

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.

- Direct Thermal and Thermal Transfer printer models available.
- Includes ZD420 Healthcare printer models with plastics that withstand common hospital cleaning chemicals and include a medical grade power supply.
- ZD620 printers can support printing speeds* up to 203.4 mm/s per second (8 ips - inches per second) for 203 dpi (dots per inch print density) printers and 152.4 mm/s (6 ips) for 300 dpi version printers.
- ZD420 printers can support printing speeds* up to 152.4 mm/s per second (6 ips) for 203 dpi printers and 101.6 mm/s (4 ips) for 300 dpi version printers.
- These printers support ZPL™ and EPL Zebra printer programming languages and a wide variety of other printer control languages via Link-OS Virtual Devices.

* — Maximum print speeds vary by model, print resolution, and the type of media in use.

Common Desktop Link-OS Printer Features:

- OpenAccess™ design for simplified media loading.
- Color-coded “touch points” for operator controls and media guides.
- Enhanced user interface featuring three buttons and five status indicators.
- Easy, field installable media handling options.
- Media roll support:
 - Outer Diameter (O.D.): Up to 127 mm (5 inch) and
 - Inner Diameter (I.D.) roll cores: 12.7 mm (0.5 inch), 25.4 mm (1 inch) and additional core sizes with optional media core adapters.
- Movable Sensor provides compatibility with the widest range of media types:
 - Compatible with full or partial width black mark media.
 - Compatible with notched or slotted media.
 - Multi-center position transmissivity sensor for use with label gap/web media.
- Universal Serial Bus (USB) Host Port that can be used for easy firmware updates.
- Universal Serial Bus (USB) 2.0 interface
- Modular Connectivity Slot for field installable 10/100 Ethernet (802.3 RJ-45) or Serial (RS-232 DB-9) interface options.
- On-the-fly OpenType and TrueType font scaling and import, Unicode, resident scalable font (Swiss 721 Latin 1 font), and a selection of resident bitmap fonts.
- Backwards compatibility focused technology eases printer replacement:
 - Drop in replacement of legacy Zebra desktop printers. The printer accepts both EPL and ZPL programming languages.
 - Supports Link-OS virtual devices to interpret non-Zebra printer programming languages.
- XML-Enabled printing—allows XML communications for barcode label printing, eliminating license fees and print server hardware and lowering customization and programming costs.
- Zebra™ Global Printing Solution – supports Microsoft Windows keyboard encoding (and ANSI), Unicode UTF-8 and UTF 16 (Unicode Transformation Formats), XML, ASCII (7 and 8 bit used by legacy programs and systems), basic single and double byte font encoding, JIS and Shift-JIS (Japanese International Standards), Hexadecimal encoding, and custom character mapping (DAT table creation, font linking, and character remapping).
- Factory installed network models support printer configuration via 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.
 - Zebra’s Print Touch (Near Field Communication - NFC) ‘tap’ to pair devices, access printer information, and access mobile applications.
- Zebra’s Link-OS - an open platform that connects operating systems for smart Zebra devices with powerful software apps (applications), making the devices easy to integrate, manage and maintain from any location.
- An On-board Real Time Clock (RTC).
- Printhead maintenance reporting enabled and customizable by the user.
- Easy tool-less replacement of printhead and platen (driver) roller.
- A minimum of 64 MB of internal (E:) printer memory for storing forms, fonts, and graphics.

Link-OS 4 inch Desktop Printer Options:

- A Color LCD User Interface for easy setup, print configuration, printing, and a range of Link-OS features.
- Healthcare printer models:
 - Healthcare wipe-able plastics for disinfecting and cleaning.
 - IEC 60601-1 certified power supply.
- Factory Installed Wired and Wireless options:
 - Bluetooth Low Energy (LE) wireless connectivity
 - Wi-Fi (802.11ac – includes a/b/g/n), Bluetooth Classic 4.X (3.X compatible), and Bluetooth Low Energy (LE) wireless connectivity.
 - Factory installed Internal Ethernet Print Server (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 m and 300 m ribbons) models.
- ZD620 and select ZD420 printers have an factory installed, on-board Real Time Clock (RTC) in 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) — supports 10Base-T, 100Base-TX and fast Ethernet 10/100 auto-switching networks.
 - Serial (RS-232 DB-9) Port
- Field installable media handling options:
 - Label Dispenser (Peel-Off liner and present the label for the operator).
 - 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 include adapters for media rolls with Outer Diameters (O.D.) up to 127 mm (5 inches):
 - 38.1 mm (1.5 inch) I.D. media cores.
 - 50.8 mm (2.0 inch) I.D. media cores.
 - 76.2 (3.0 inch) I.D. media cores.
- Attached Power Supply Base with internal power supply.
- Attached Battery Base with removable Battery.
 - Attached Battery Base and Battery are sold separately.
 - The battery provides a constant regulated 24 VDC until the battery shutdown 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.
- Field upgrade kit to change printer resolution is available. Change your printer from 203 dpi to 300 dpi - or - from 300 dpi to 203 dpi printing with these tool-less upgrade kits.
- Asian Language support with printer configuration options for the large Simplified and Traditional Chinese, Japanese, or Korean character sets.

Introduction

- Printers sold in China have the Simplified Chinese SimSun font pre-installed.
- Zebra® ZBI 2.0™ (Zebra BASIC Interpreter) programming language. ZBI allows you to create custom printer operations that can automate processes, use peripherals (i.e. scanners, scales, keyboards, Zebra® ZKDU™, etc.) all without being attached to a PC or network.
- Locking Media Cabinet for ZD620 Direct Thermal Healthcare printer models. This special Healthcare model includes for additional security, Kensington™ Slot for Kensington locking devices to secure the printer.

Zebra Label Printing Solution

The printer is just one of three (3) parts of a printing solution. To print; you need a printer (ZD620 or ZD420), compatible media (thermal transfer ribbon cartridge or rolls, and thermal transfer media; or just direct thermal media), and software (driver, applications or programming) to tell the printer what to do and print. The printer can print without being connected to other devices or systems.

The media may be labels, tags, tickets, receipt paper, fan-fold stacks, tamper proof labels, etc.

Zebra assists you with label design and print with the free label and form design software: ZebraDesigner™ for Windows PC operating systems.

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.

The Zebra web site or your reseller will be able to help you identify media for your desired use case.

Modes of Printing

You can operate this printer in many different modes and media configurations:

- Direct thermal printing (which uses heat sensitive media to print).
- Thermal transfer printing with easy to use thermal transfer ribbon cartridge or ribbon rolls (heat and pressure transfers ink from the ribbon to media).
- Standard Tear-Off mode allows you to tear off each label/receipt or batch print a strip of labels and tear them off after it is printed.
- Label Dispense Mode: If an optional dispenser is installed, the backing material can be peeled away from the label as it is printed. After this label is removed, the next one is printed.
- Media Cutting: If an optional media cutter is installed, the printer can cut the label liner between labels, receipt paper or tag stock.
- Linerless media printing with Cut or Tear-Off label options for easy pick and place label applications.
- Stand-alone: The printer can print without being directly connected to a computer.
 - A printer with the color LCD display option can use menus to access and print a label format/form.
 - A Link-OS App connecting via Bluetooth (Wireless option).
 - An auto running label format/form (programming based).
 - A data input device connected to the printer's USB Host port or serial port. This mode accommodates data input devices, such as scanners, weigh scales, a Zebra Keyboard Display Unit (ZKDU), etc.
- Shared network printing: Printers configured with Ethernet (LAN) and Wi-Fi interface options include an internal print server.

What's in the Box?

After unpacking, make sure you have all parts shown below. Follow the procedures for inspecting the printer to familiarize yourself with printer parts so you can follow the instructions in this book.



Printer



USB Cable



Printer Documentation



Power Supply



Included with Thermal Transfer Printer (uses ribbon rolls)



Empty Starter Ribbon Cores



Non-Zebra 300 Meter Ribbon Adapters

Unpack and Inspect the Printer

When you receive the printer, immediately unpack it and inspect for shipping damage.

- Save all packing materials.
- Check all exterior surfaces for damage.
- Open the printer and inspect the media compartment for damage to components.

If you discover shipping damage upon inspection:

- Immediately notify the shipping company and file a damage report. 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.
- Keep all packaging material for shipping company inspection.
- Notify your authorized Zebra® reseller.

See the Zebra Web site for 'How To' videos on packing and unpacking your printer. See [About](#) section for links to one of these 5 basic Link-OS printer variations.

Open the Printer

To access the media compartment, pull the release latches towards you and lift the cover. Check the media compartment for loose or damaged components.



ESD 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 the printer

Lower the top cover. 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. 'How to' videos on the Zebra Web site include a Printer Features video; as well as; other printer setup and task specific videos. Links to these five (5) Link-OS 4-inch desktop printers are:

- 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

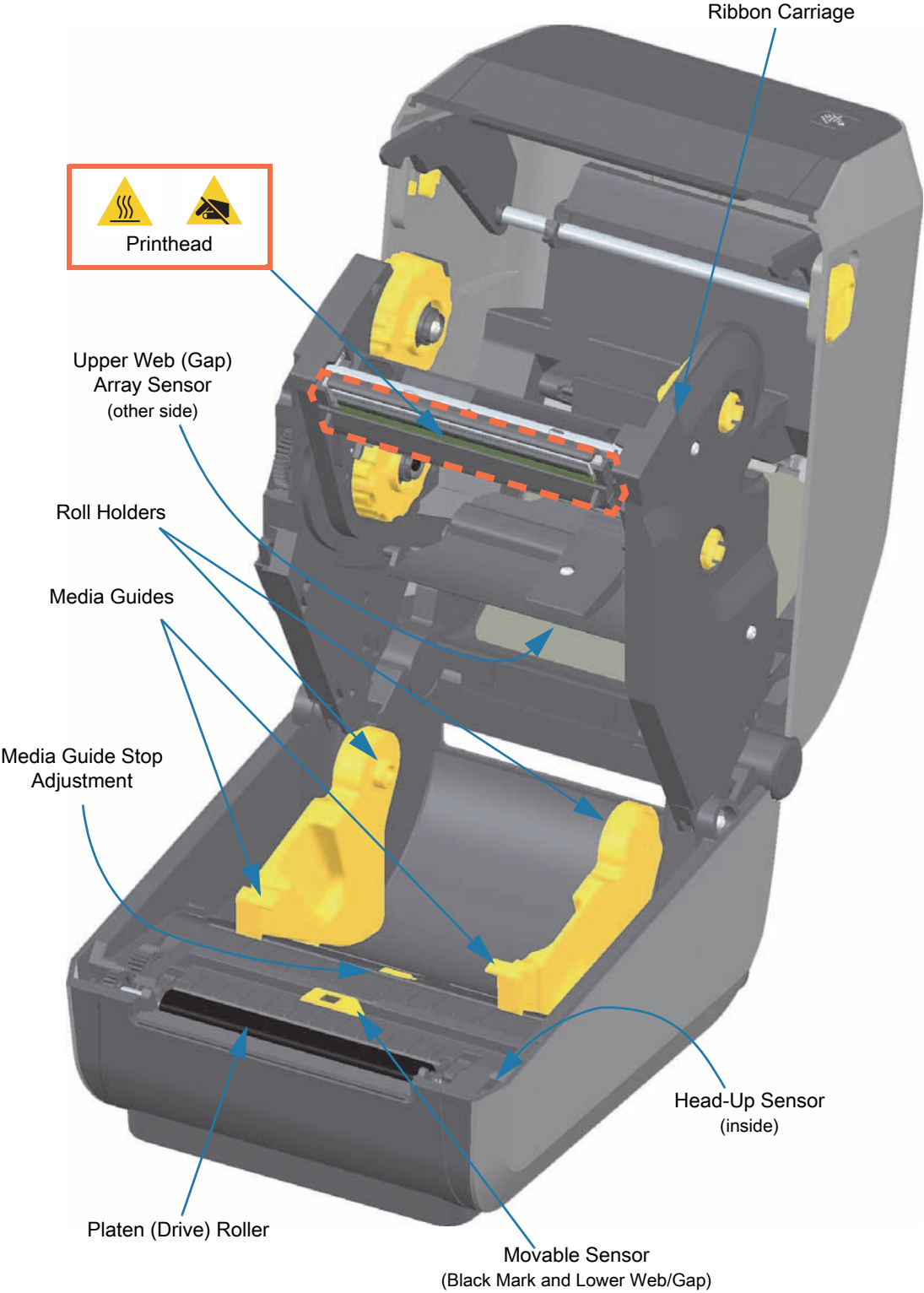
Printer Features



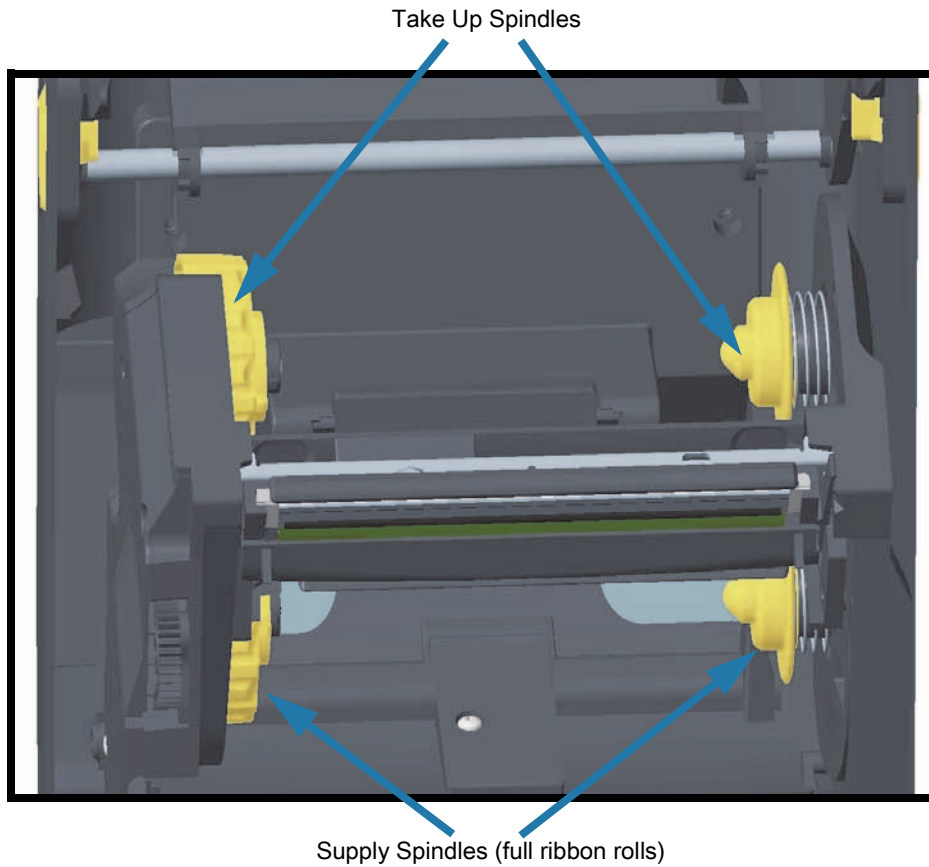
For more details on printer controls, see [Controls and Indicators](#)



Inside the ZD620 Dual Capacity Ribbon Roll Printer



Dual Capacity Ribbon Chassis - Ribbon Roll Holders

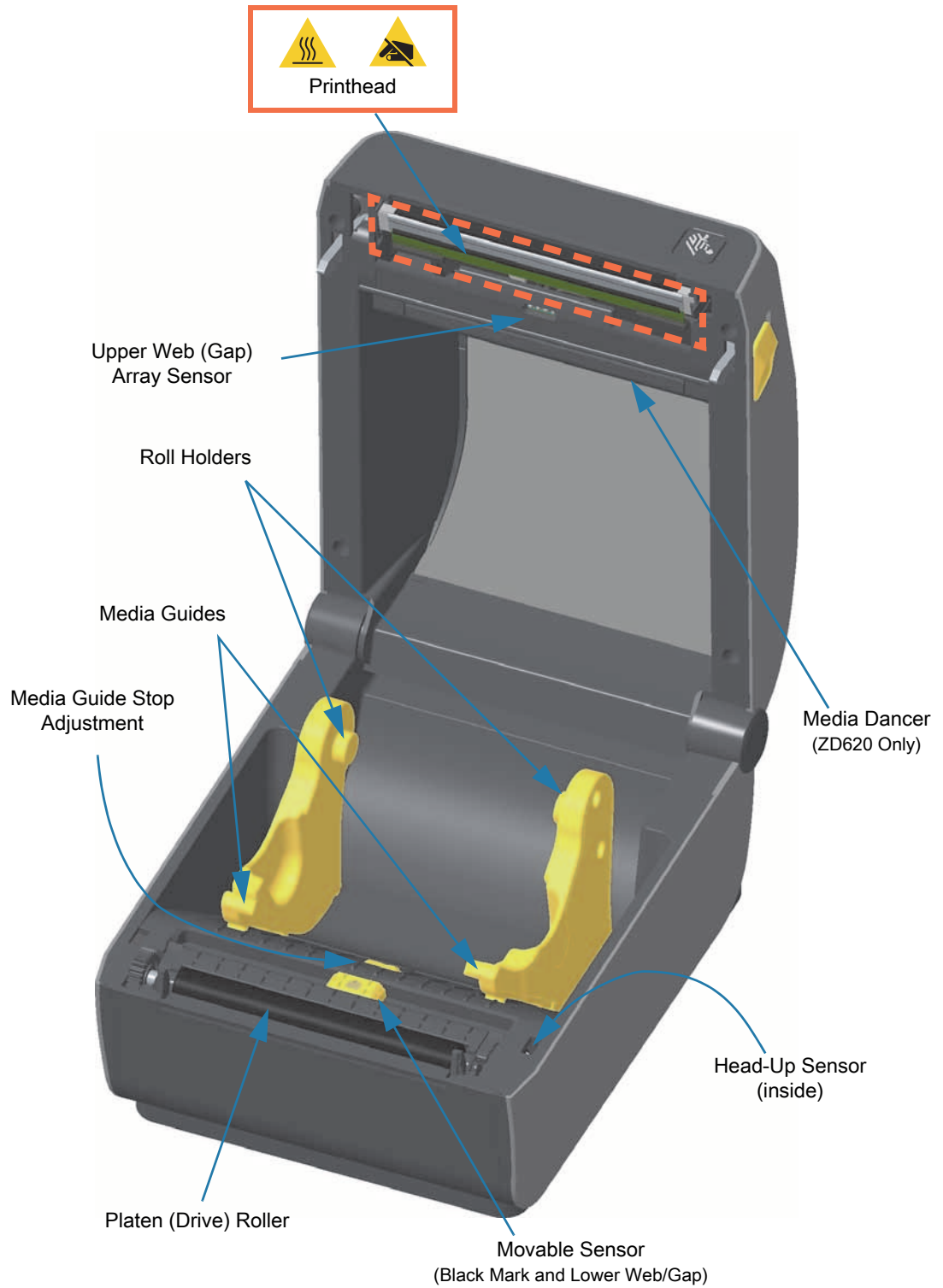


Media Dancer - ZD620 Printer Models Only

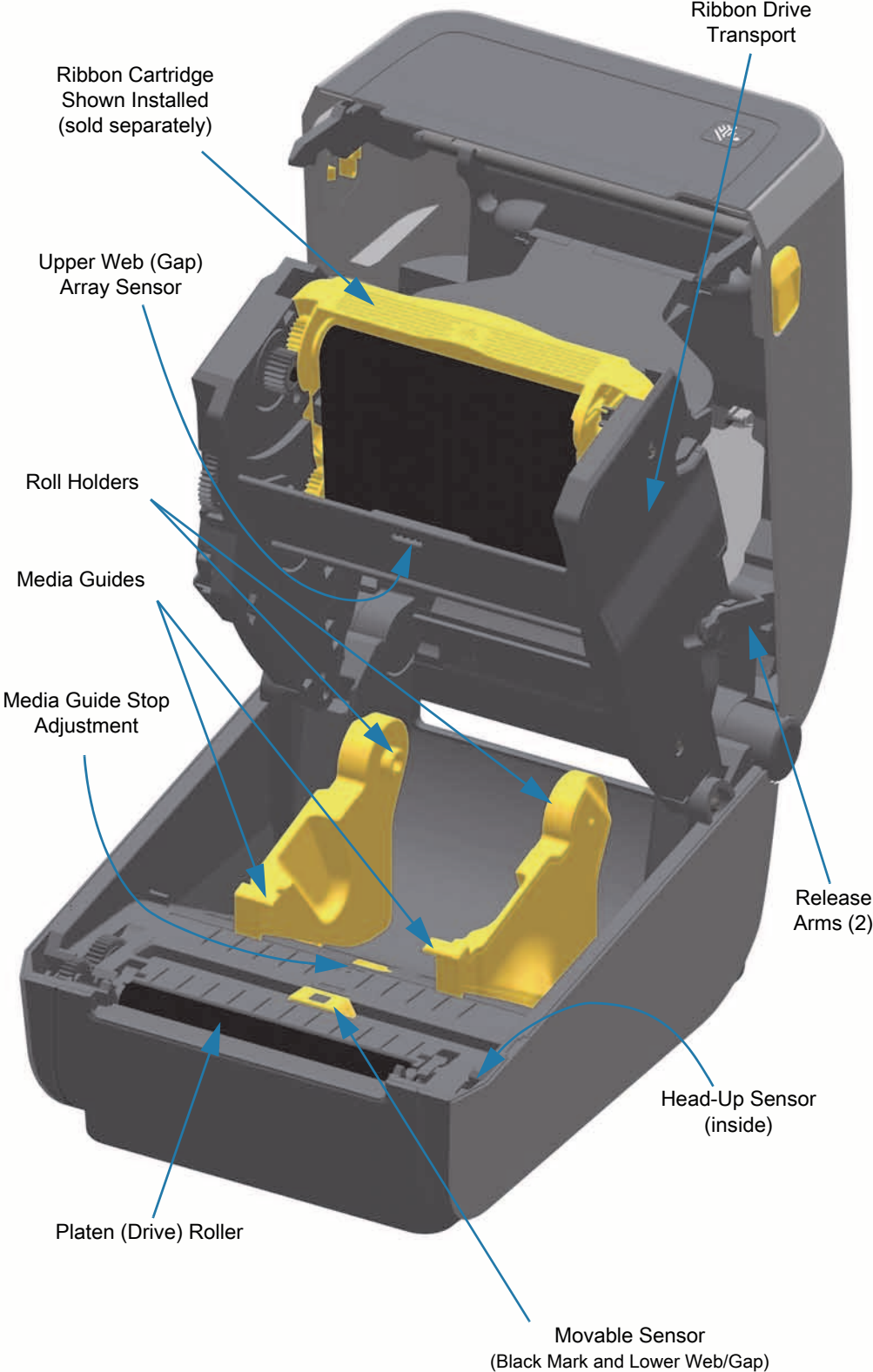
The printer's window is removed to show the Media Dancer (plate). The Media Dancer is re-colored to make it easier to see. It is the same color as the dark gray parts adjacent to it.



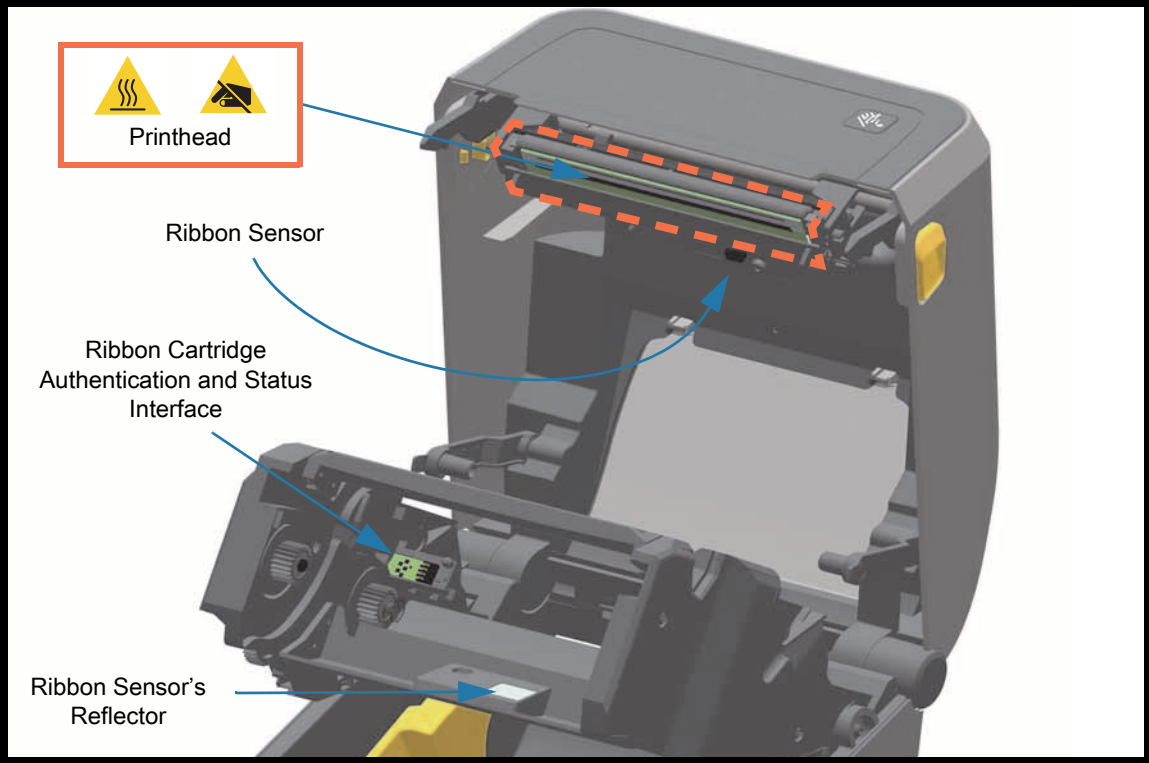
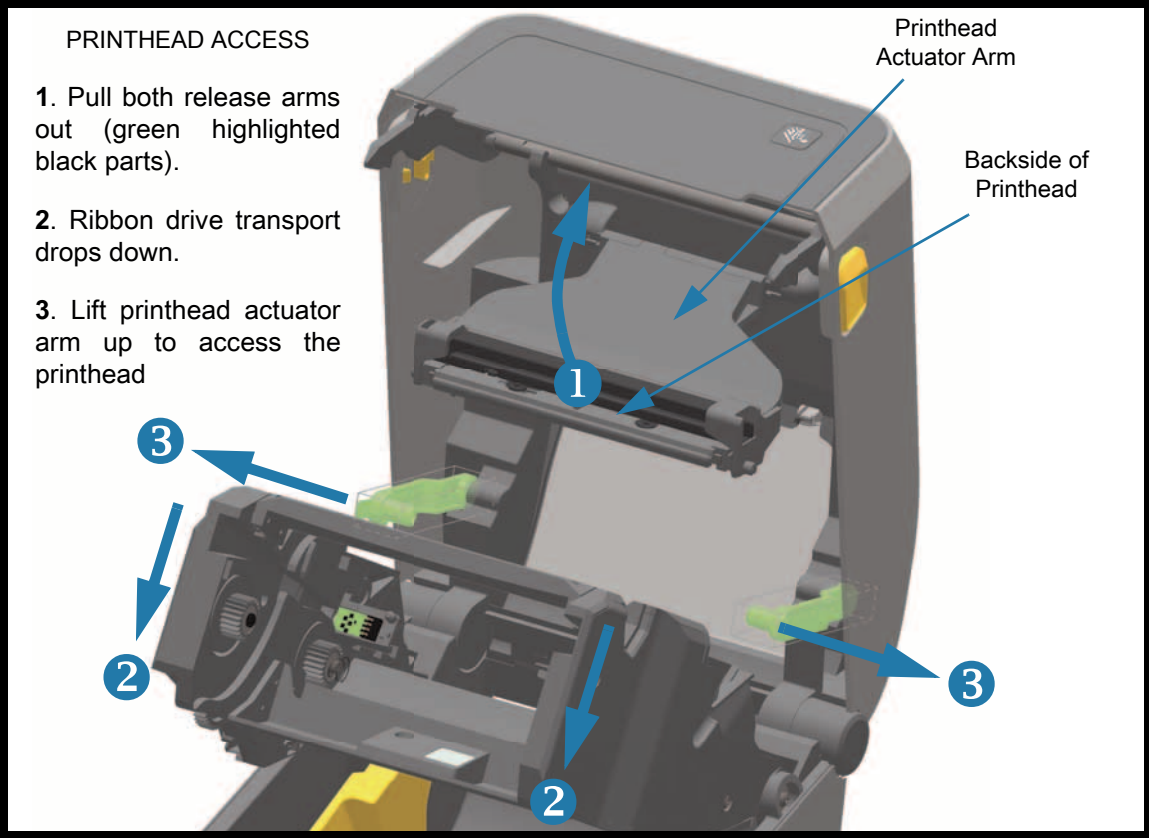
Inside the ZD620 and ZD420 Direct Thermal Printers



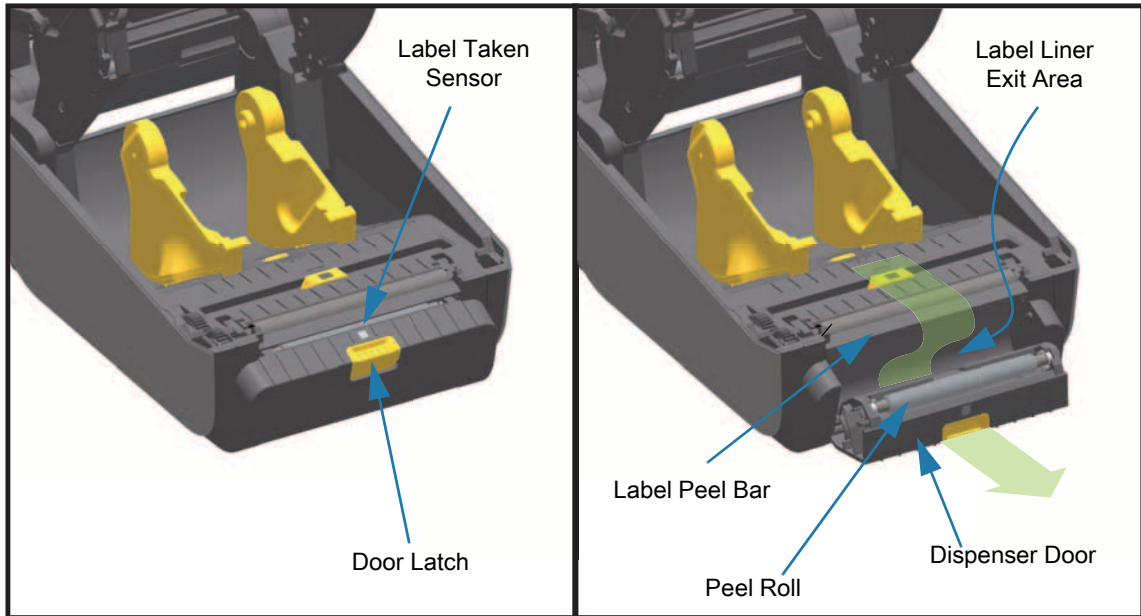
Inside the ZD420 Ribbon Cartridge Printer



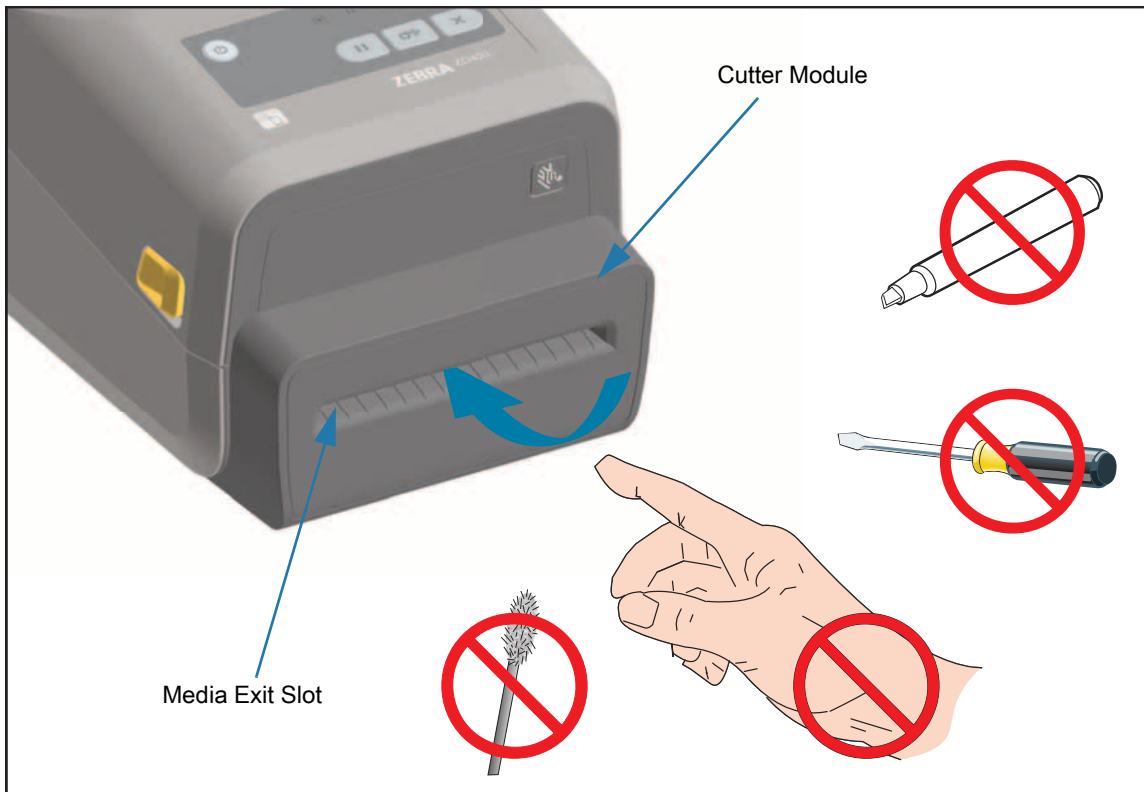
Accessing the Printhead of the Ribbon Cartridge Printer



Label Dispenser Option (field installable) - All Models



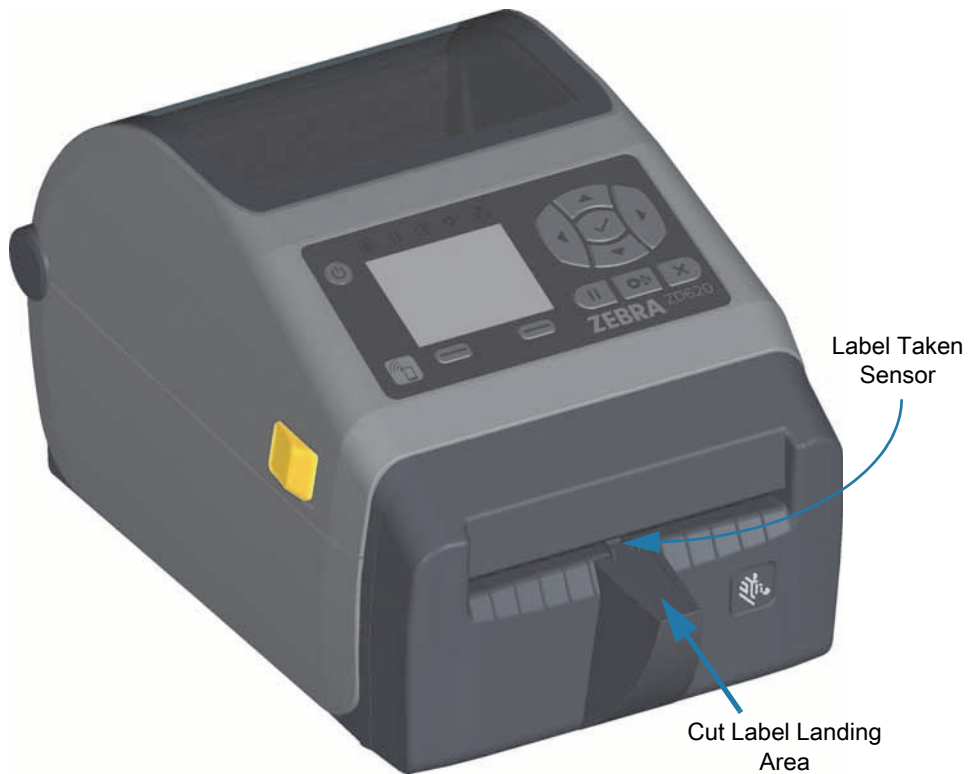
Cutter Option (field installable) - All Models



Linerless Media Tear-Off Option (Direct Thermal Models Only)



Linerless Cutter Option (Direct Thermal Models Only)



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). Do not exchange platen types unless instructed to by an upgrade procedure or Zebra technical support. The printer will not operate correctly and may cause a variety of problems requiring maintenance.

203 dpi Standard Platen (black)



300 dpi Standard Platen (gray)



203 dpi Linerless Platen (reddish-brown)



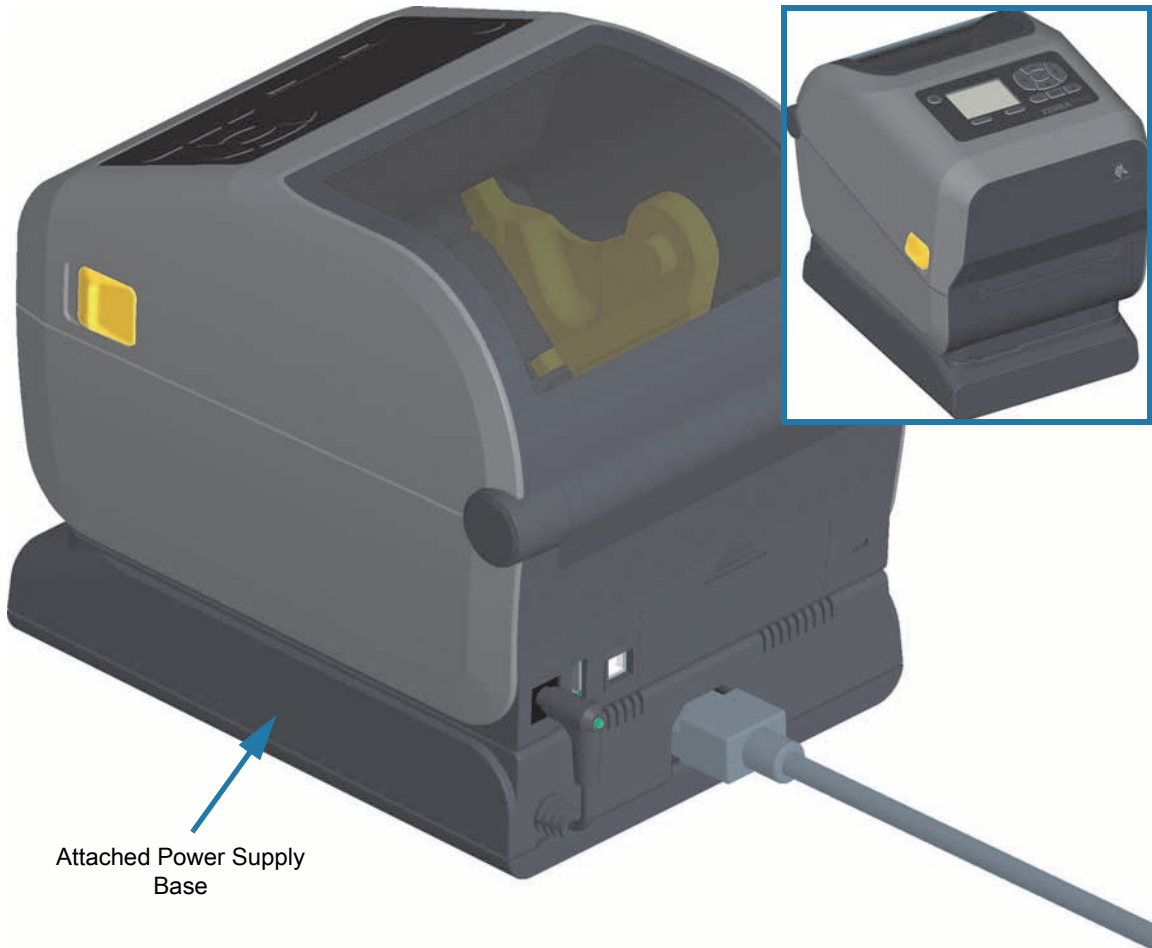
300 dpi Linerless Platen (brown)



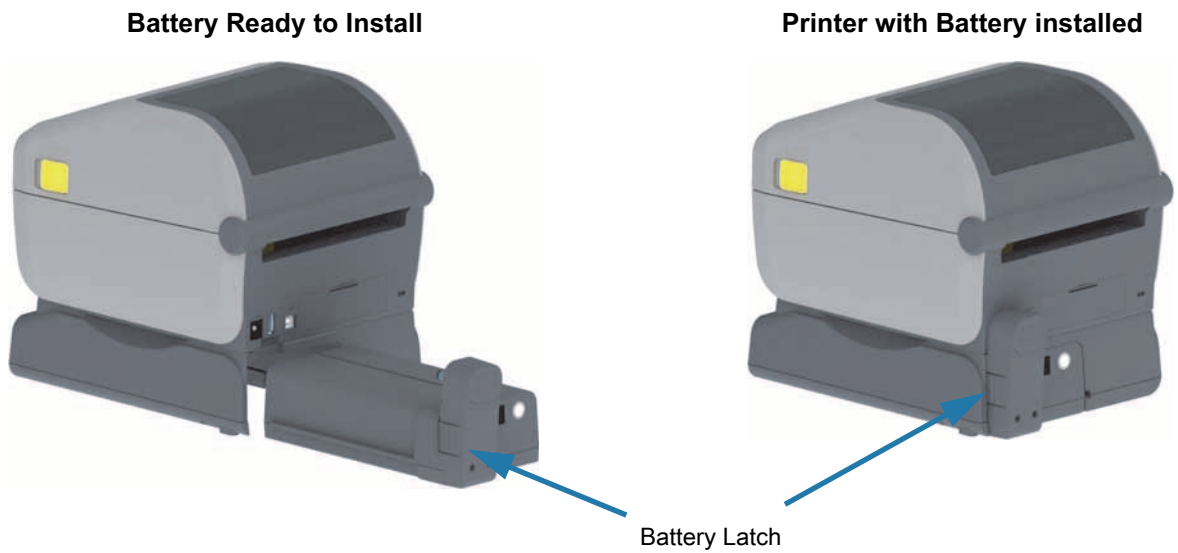
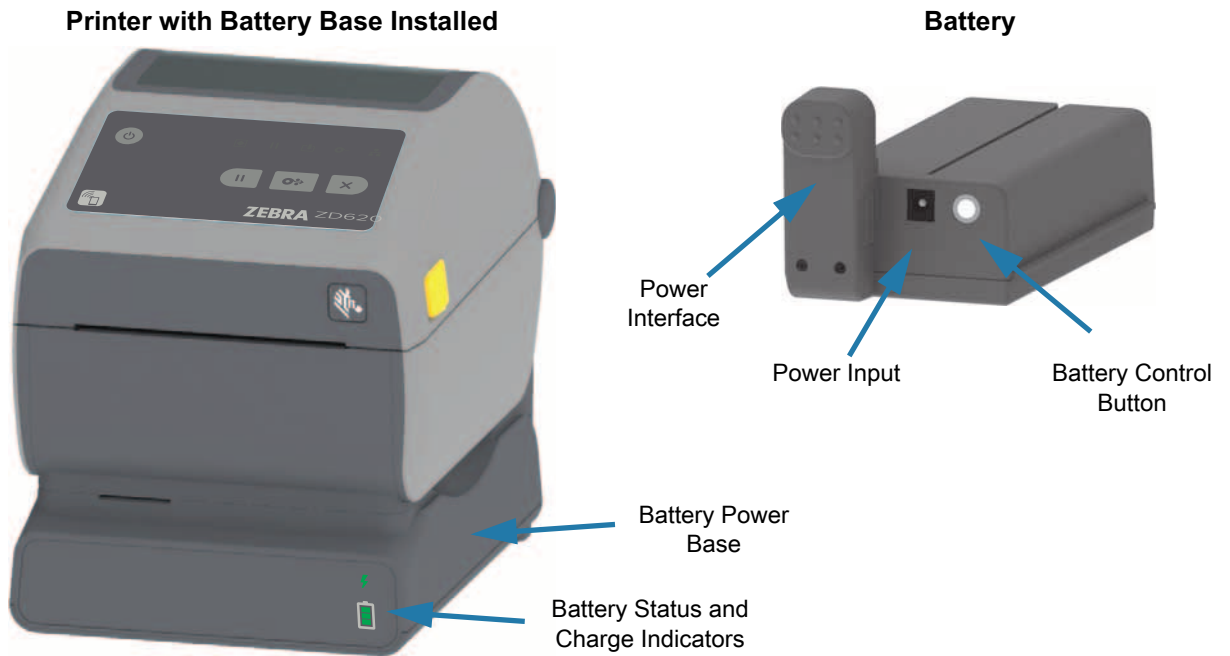
Printer Power Supply Options

ZD-Series printers offer field installable attached power options: 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



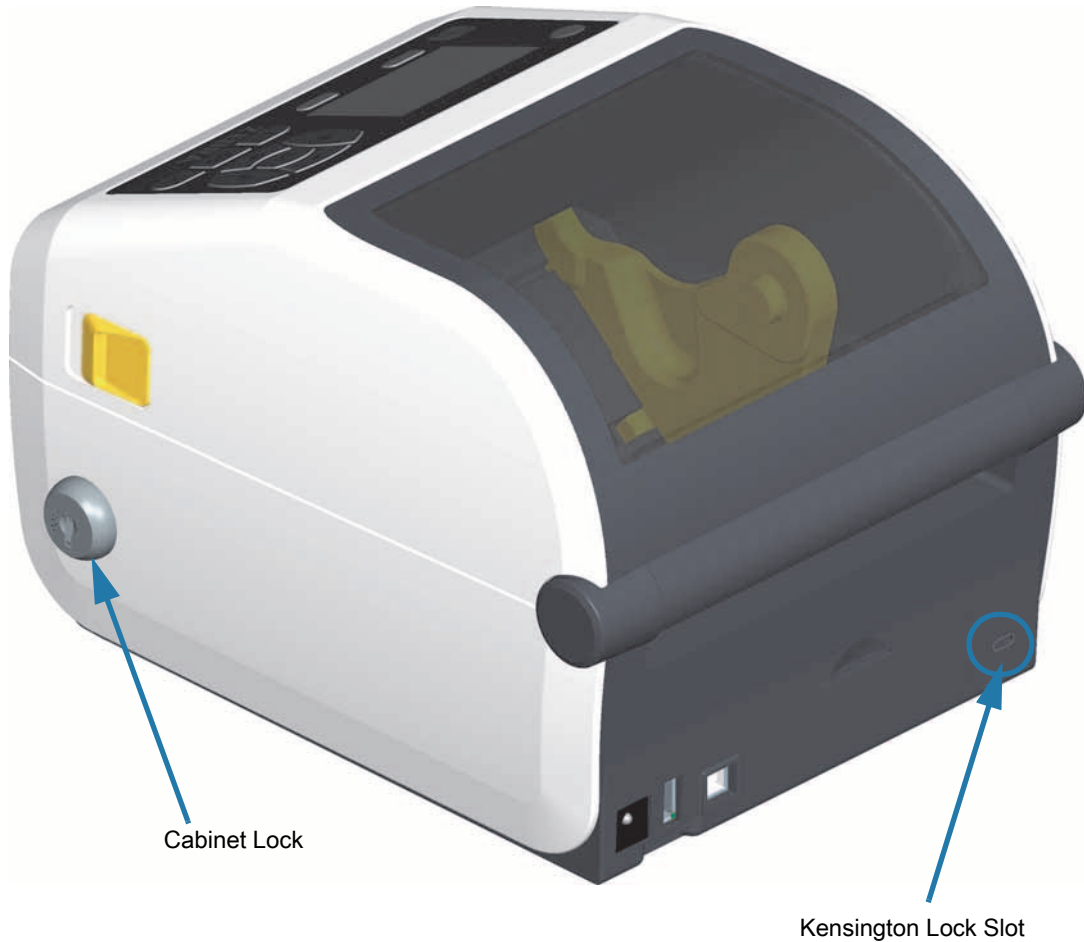
Attached Battery Base and Battery



Important • The battery can be charged, checked, and configured for storage all without the printer. A printer power supply or other approved Zebra power source is needed to charge your battery.

ZD620 Locking Printer Features

This option is only available in a Healthcare printer models. It includes a lock and key access to the printer's media compartment and a Kensington Lock Slot on the back panel of the printer to secure the printer. For more information on the Locking Printer option, see [ZBI 2.0™ — Zebra Basic Interpreter](#).



Zebra Print Touch

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



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:

- Facilitate Bluetooth pairing with a compatible mobile device
- 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 • It is strongly recommended that you update your printer's firmware after the printer has completed the setup process. 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

Printer Connectivity Modules

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

- **ZD420 Serial Port** — [Installing the Serial Port Module](#)
 - RS-232 DB-9 connector with DTE/DTC auto-switching — [Serial Port Interface](#)
- **ZD420 Internal Ethernet (LAN - wired)** — [Installing the Internal Ethernet \(LAN\) Module](#)
 - 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](#).

- **Label Dispenser** (Peel-Off Liner and Present Label for Operator) - [Installing the Label Dispenser](#)
- **General Purpose Media Cutter** — [Installing the Standard Media Cutter](#)
- **Linerless Media Cutter** — [Installing the Linerless Media 'Tear-Off' Bezel](#)
- **Linerless Media 'Tear-Off' Label Bezel** — [Installing the Linerless Media 'Tear-Off' Bezel](#)
- **Printer Resolution Upgrade Kits** (203 dpi and 300 dpi) - [Print Resolution Upgrade Kits](#)
- **Media Roll Adapters** for 38.1 mm (1.5 inches), 50.8 mm (2.0 inches), or 76.2 mm (3.0 inches) I.D. media cores - [Media Roll Core Size Adapters](#)

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](#)
- **Battery Power Base** (battery pack sold separately) — [Installing the Attached Battery Base Options](#)
- **Battery Pack** (battery power base sold separately) — [Installing the Battery into the Attached Power Base](#)

Printer Connectivity Modules

The connectivity modules can be easily installed without tools.



ESD 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.

Power Failure Recovery Mode Jumper (OFF by Default)

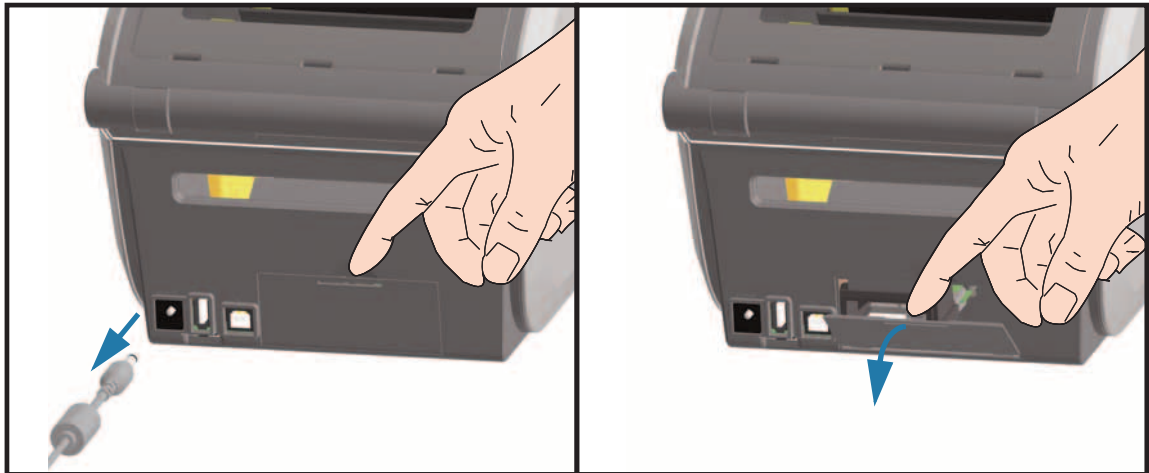
All of the Printer Connectivity Modules have a Power Failure Recovery jumper. It is set to the OFF position by default. With the jumper set to ON, the printer will automatically Power ON when plugged into an active (ON) AC power source (and not power off). See [Standard Interface Controls - Power Button - Power Failure Recovery Mode](#) for power ON/OFF behaviors. See [Setting the Power Failure Recovery Mode Jumper](#) for instructions on activating the mode.



Note • The Power Failure Recovery Mode is only available on printers with a Printer Connectivity Module installed in your printer.

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 finger tip. This releases the latch. Pull the door away 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.



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](#).

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. Swing the door up and snap the cover closed.

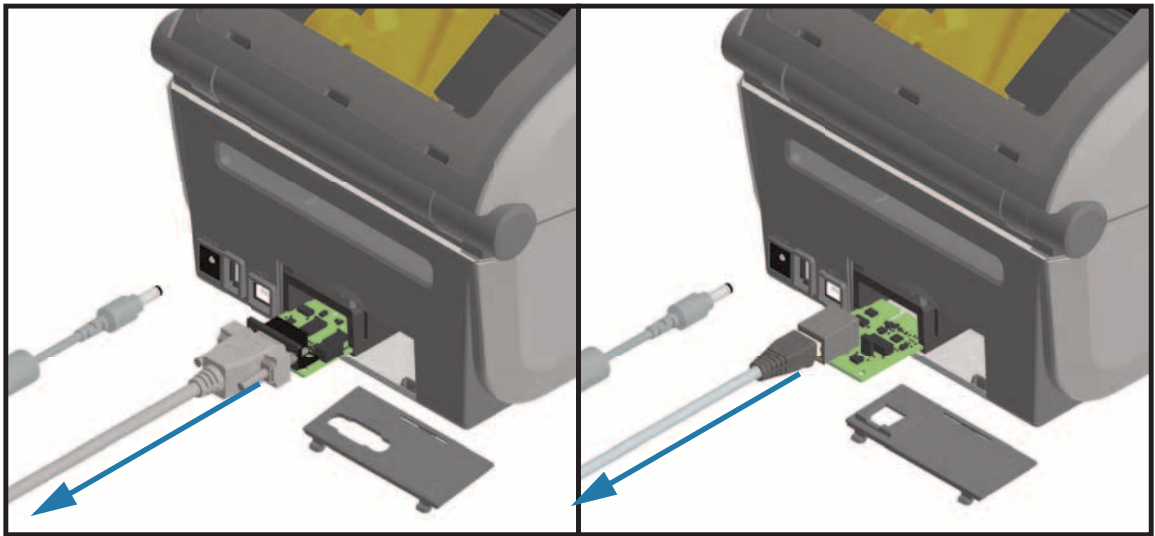


Note • For best printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#).

Removing Printer Connectivity Modules

Connectivity modules can easily be removed for the purpose of reconfiguring a printer or repair. You should not remove and replace connectivity modules 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. Pull the door away and down to remove.
3. Re-attach the interface cable to the connectivity module and secure the cable.
4. Gently pull on the interface cable that is secured to the connectivity module. Slowly pull the module out of the printer.
5. 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

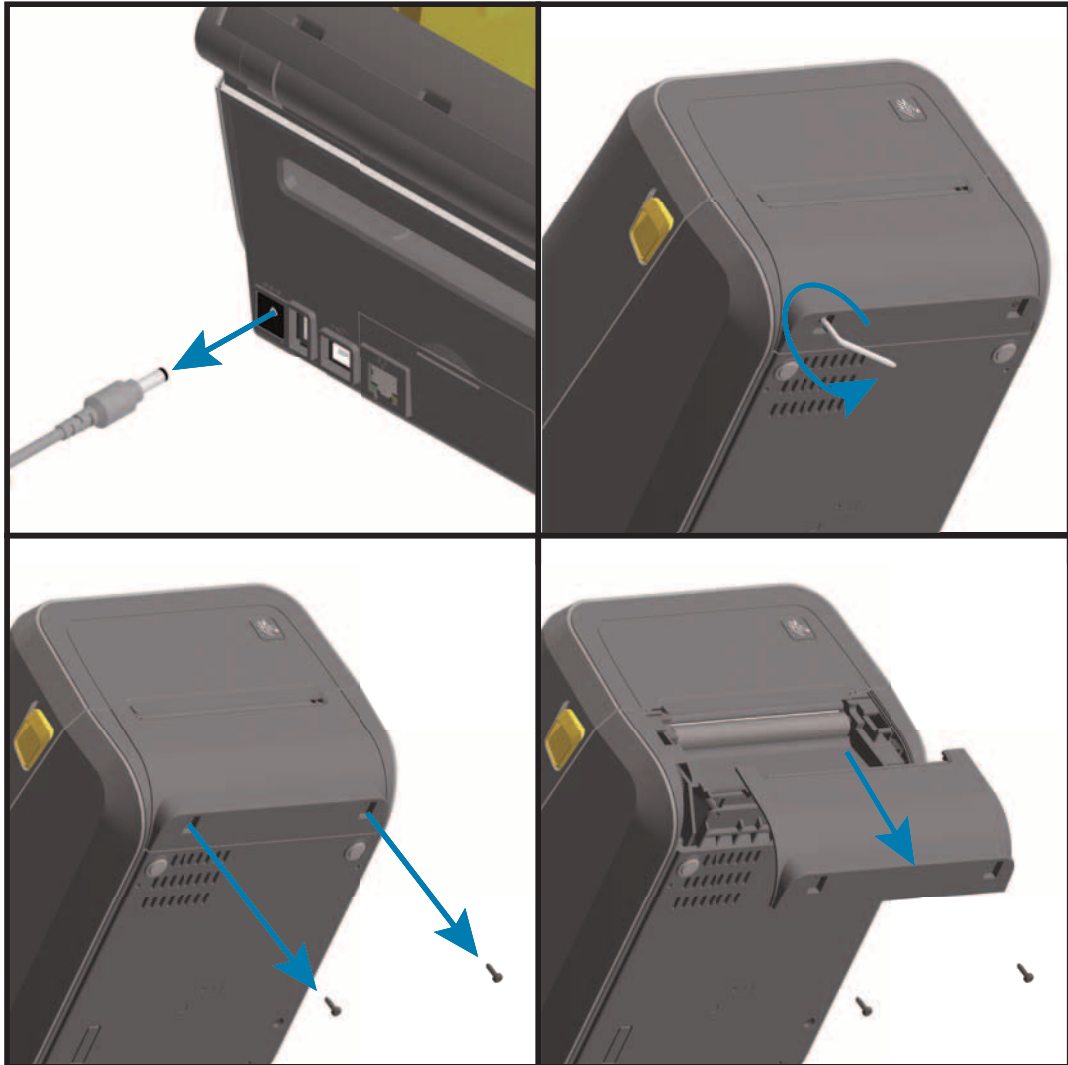


ESD Caution • The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components.

Removing the Standard Bezel

The standard bezel must be removed to mount your media handling option.

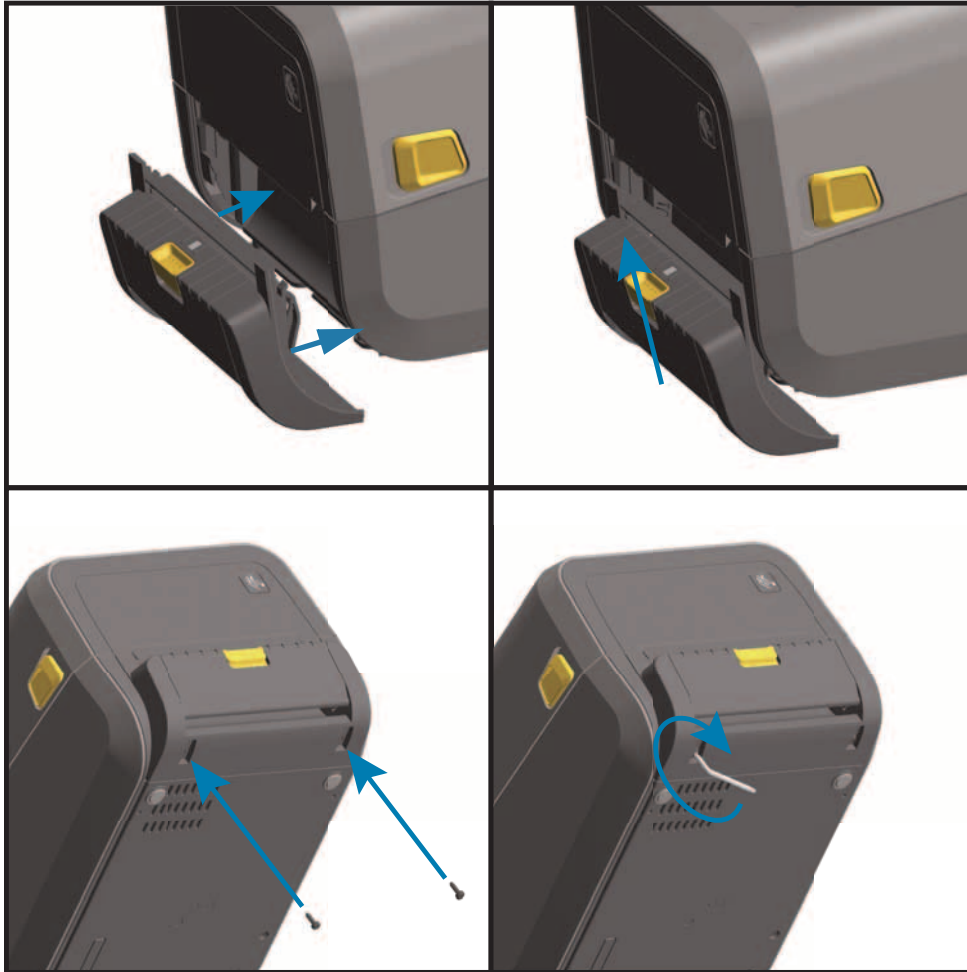
1. Disconnect the printer's DC power input plug from the rear of the printer.
2. Turn the printer upside down. Remove the two (2) mounting screws with the supplied Torx wrench. Save the screws.
3. Slide the bezel down the front about 12.5 mm (0.5 inch) and pull the loose bezel out.



Installing the Label Dispenser

The standard bezel must be removed and DC input power disconnected before the Label Dispenser can be installed. See [Removing the Standard Bezel](#).

1. Place the label dispenser module and printer right side up with the top of the module 12.5 mm (0.5 inch) 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 best printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#).

Installing the Standard Media Cutter

The standard bezel must be removed and DC input power disconnected before the Label Dispenser can be installed. See [Removing the Standard Bezel](#).

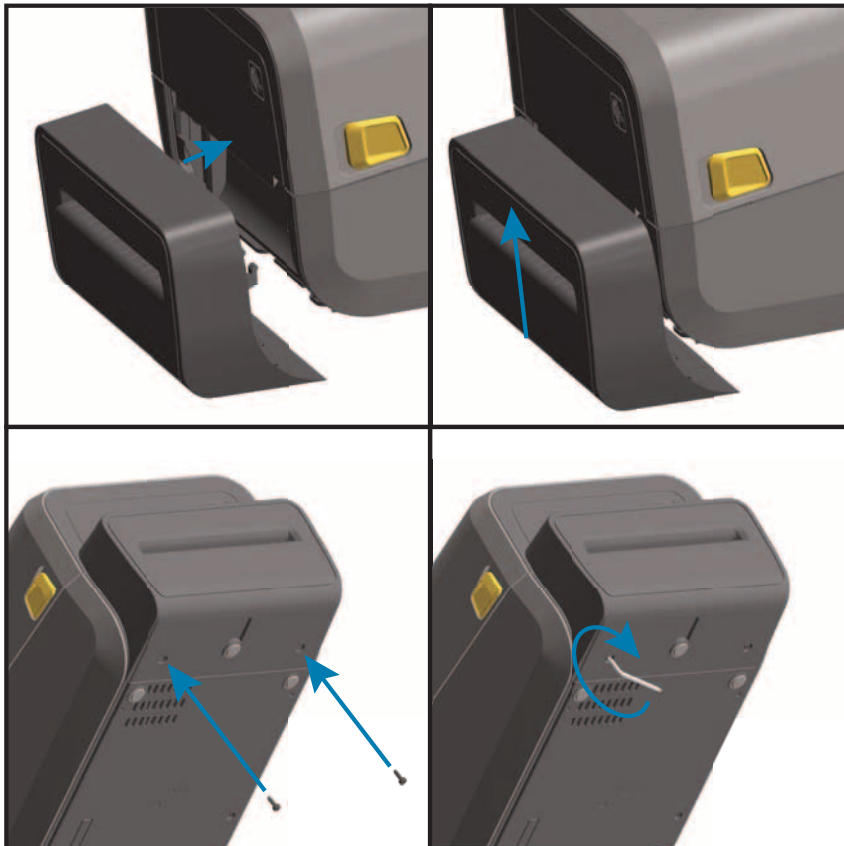


Cut Warning • There are no operator serviceable parts in the cutter unit. Never remove the cutter cover (bezel). Never attempt to insert objects or fingers in to the cutter mechanism.



Important• Using un-approved tools, cotton swabs, solvents, etc. all 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.

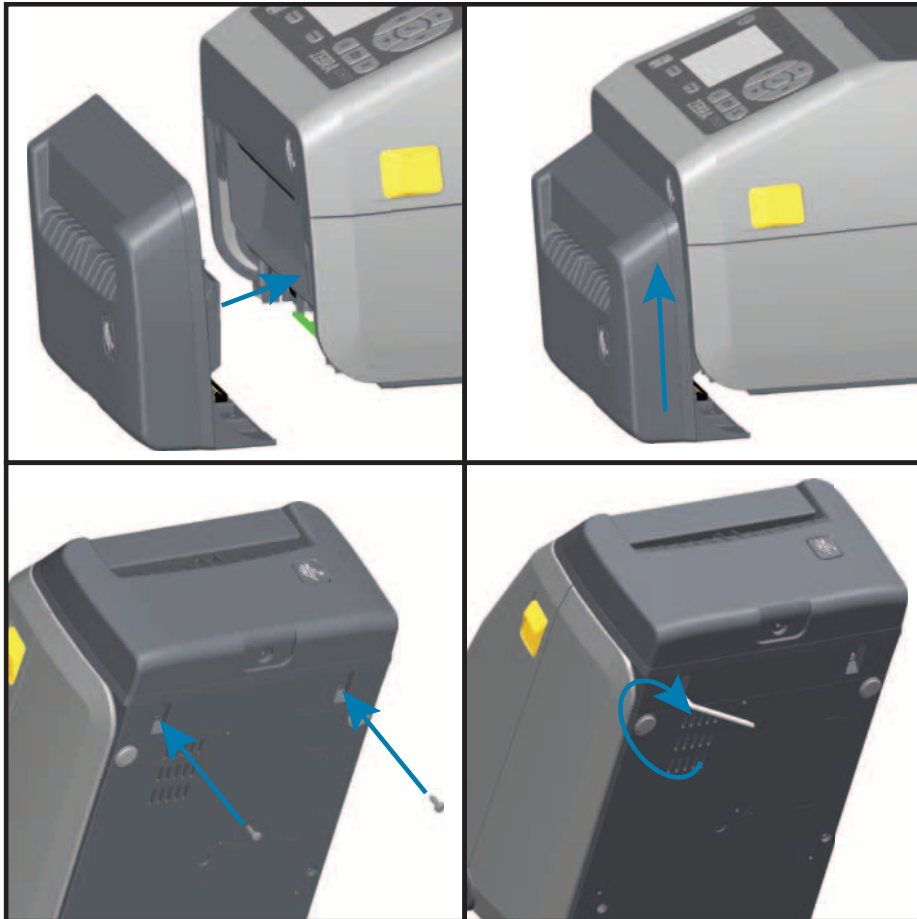


Note • For best printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#).

Installing the Linerless Media Cutter

The standard bezel must be removed and DC input power disconnected before the Linerless Media Cutter Module can be installed. See [Removing the Standard Bezel](#).

1. Open the printer and remove replace the standard platen roller with the Linerless platen roller. See [Platen Cleaning and Replacement](#) for a replacement procedure. See [Installing the Printhead Resolution Upgrade Kits](#) to help you identify platen rollers.
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.

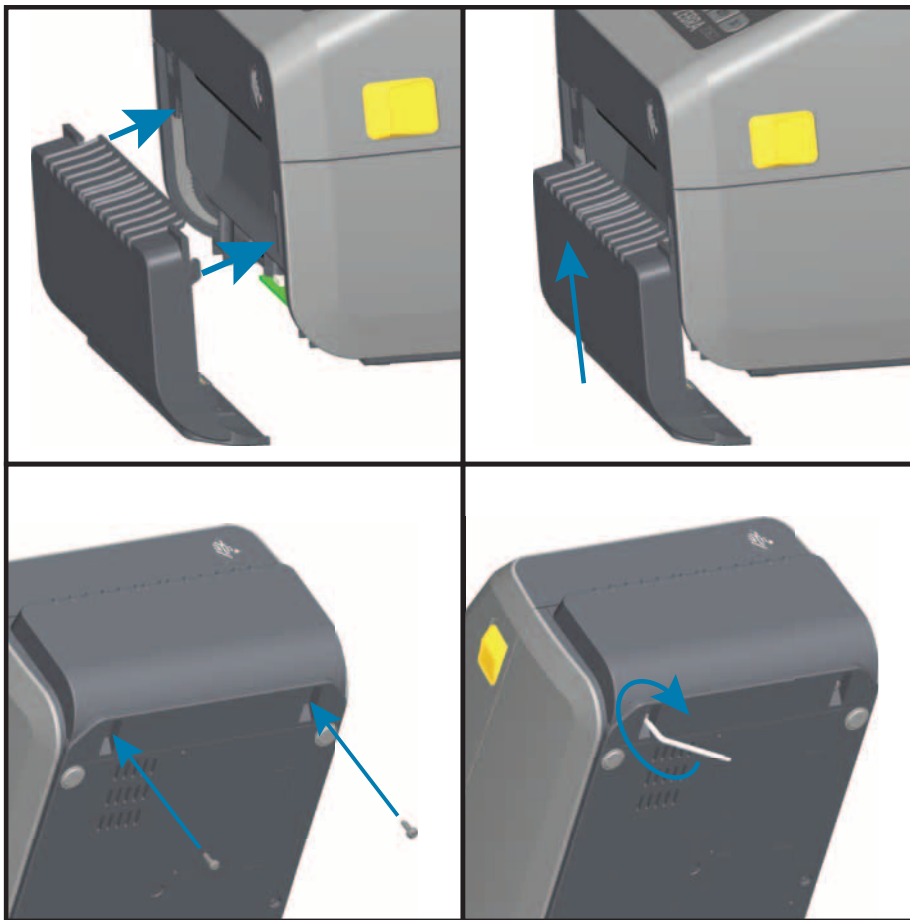


Note • For best printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#).

Installing the Linerless Media ‘Tear-Off’ Bezel

The standard bezel must be removed and DC input power disconnected before the Linerless Tear-Off Bezel module can be installed. See [Removing the Standard Bezel](#).

1. Open the printer and remove replace the standard platen roller with the Linerless platen roller. See [Platen Cleaning and Replacement](#) for a replacement procedure. See [Installing the Printhead Resolution Upgrade Kits](#) to help you identify platen rollers.
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 best printer performance, update the printer's firmware after installing options or immediately after the printer's initial setup. See [Updating Printer Firmware](#).

Media Roll Core Size Adapters

Adapter Kits

The media roll adapters kit includes three (3) pairs of media roll adapters. The kits are for the following inner diameter (I.D.) media cores:

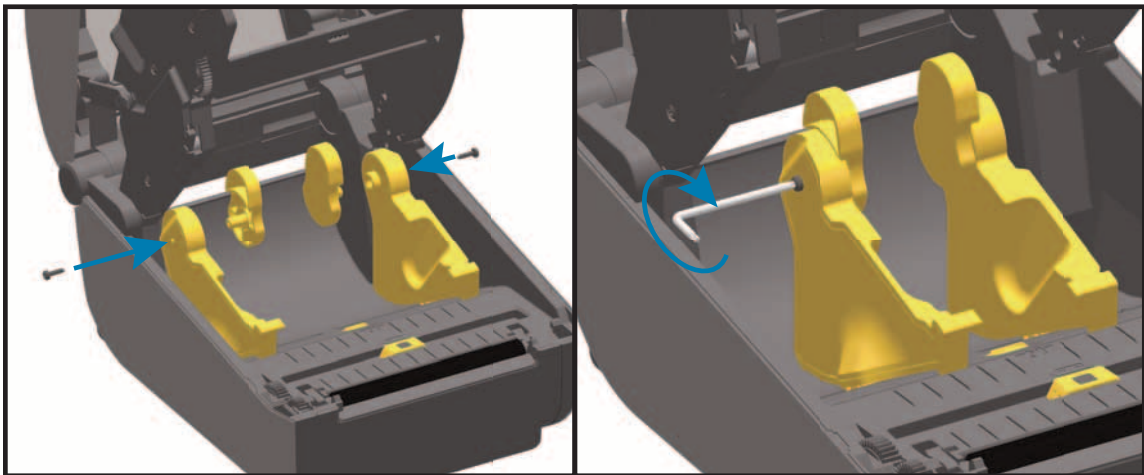
- 38.1 mm (1.5 inches)
- 50.8 mm (2.0 inches)
- 76.2 mm (3.0 inches)

Adapter Usage

- The adapters are intended to be permanently installed in the printer.
- They may be changed to support other media roll sizes that require one of these adapter sizes.
- The adapters may wear out if they are changed too much.
- Removing the media adapters to print on standard roll cores may leave plastic pieces in the media roll holders side areas that rub against the roll. Push those attached pieces back into the side of the media roll holder.

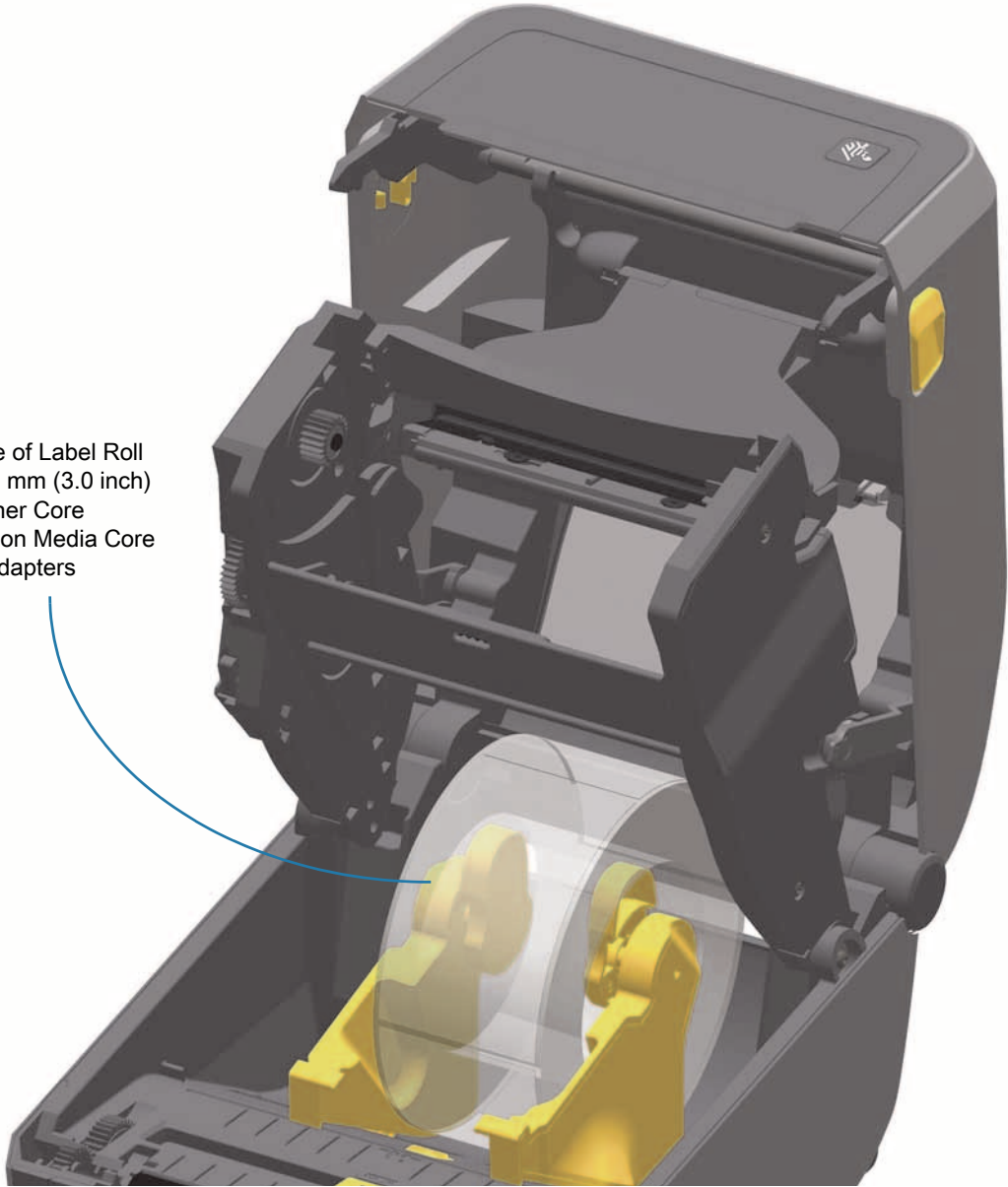
Installing Media Roll Adapters

1. Place one screw in the top adapter mounting hole of both of the roll holders. Start turning the screws clockwise using the Torx wrench until the tip of the screw is just protruding through the inside of the roll holder. The screws are self-tapping.



2. Place the adapter on the inside of the roll holder. The large side of the adapter is on top. The smooth side (no ribs) faces 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. 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. Over tightening will strip the thread.
5. Repeat step 1-4 for the other adapter and roll holder.

Example of Label Roll
with 76.2 mm (3.0 inch)
Inner Core
mounted on Media Core
Adapters



Print Resolution Upgrade Kits

There are four (4) print resolution upgrade kits. The same procedure is used to change all the printhead resolution upgrade kits. Both the printhead and platen (drive) rollers must be changed and are resolution dependent. The printer automatically detects the change in printheads and the platen roller materials are identified by color.

Standard Printing

- Change the printer from 203 dpi to 300 dpi printing.
- Change the printer from 300 dpi to 203 dpi printing.

Linerless Printing (for Direct Thermal ZD620 printers only)

- Change the printer from 203 dpi to 300 dpi printing.
- Change the printer from 300 dpi to 203 dpi printing.

Printheads used in the upgrade kits include a 203 or 300 marking to help you keep the unpackaged 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](#)

Installing the Printhead Resolution Upgrade Kits

1. Turn the printer off and disconnect the power.
2. Use the platen roller replacement procedure. See [Platen Cleaning and Replacement](#)
3. Use the printhead replacement procedure. See [Replacing the Printhead](#)
4. Re-attach power and turn the printer on. The printer will automatically detect the change in printhead (but not the platen) when the printer verifies the printer's configuration.



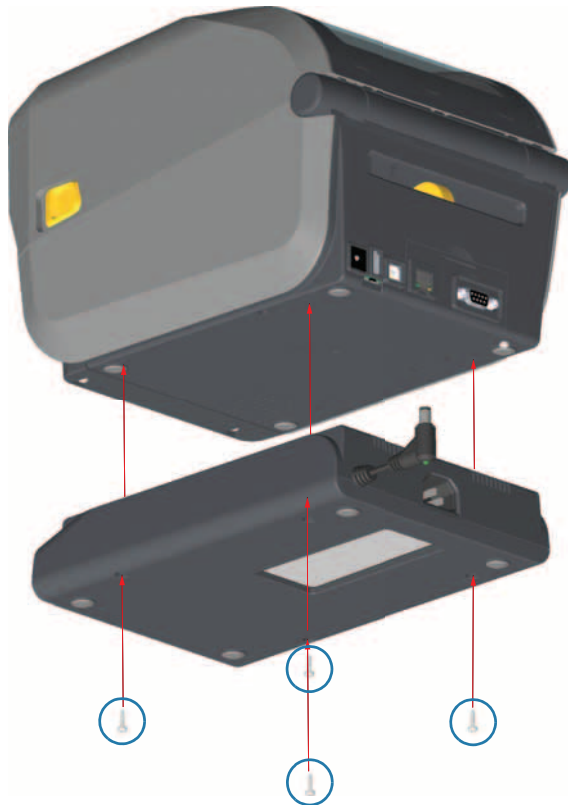
Important • For best results and the latest printer features and operation, download and install the latest printer firmware. See [Updating Printer Firmware](#).

Installing the Attached Power Supply Base Options

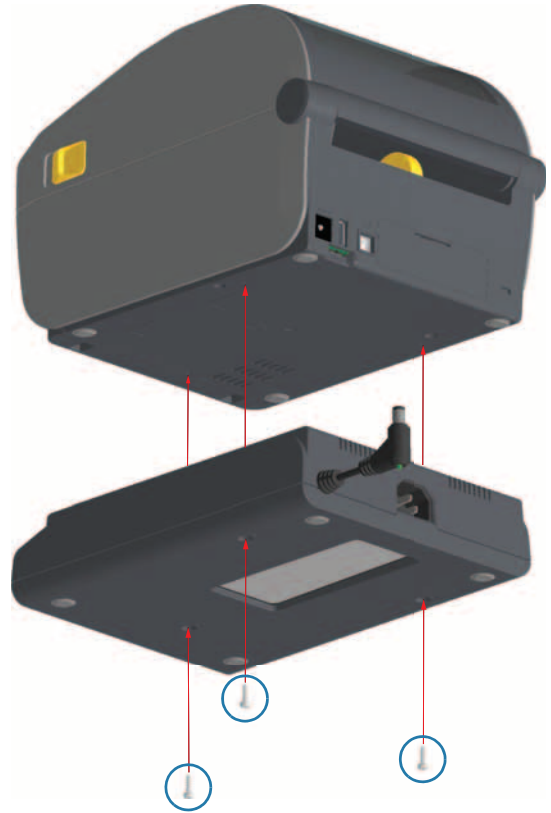
The power base is ready to attach to the printer. The base is installed using Torx T10 wrench (that you supply) and the mounting screws provided with the upgrade kit. The direct thermal printer models attach to the printer with three (3) screws and thermal transfer printer models use four (4) screws.

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 align with recesses in the top of the power base.
3. Use the screws provided to attach the power base to the printer. 3 screws for Direct Thermal printers. 4 screws for thermal Transfer printers. Tighten the screws using the Torx wrench supplied in the kit.

Thermal Transfer Printers

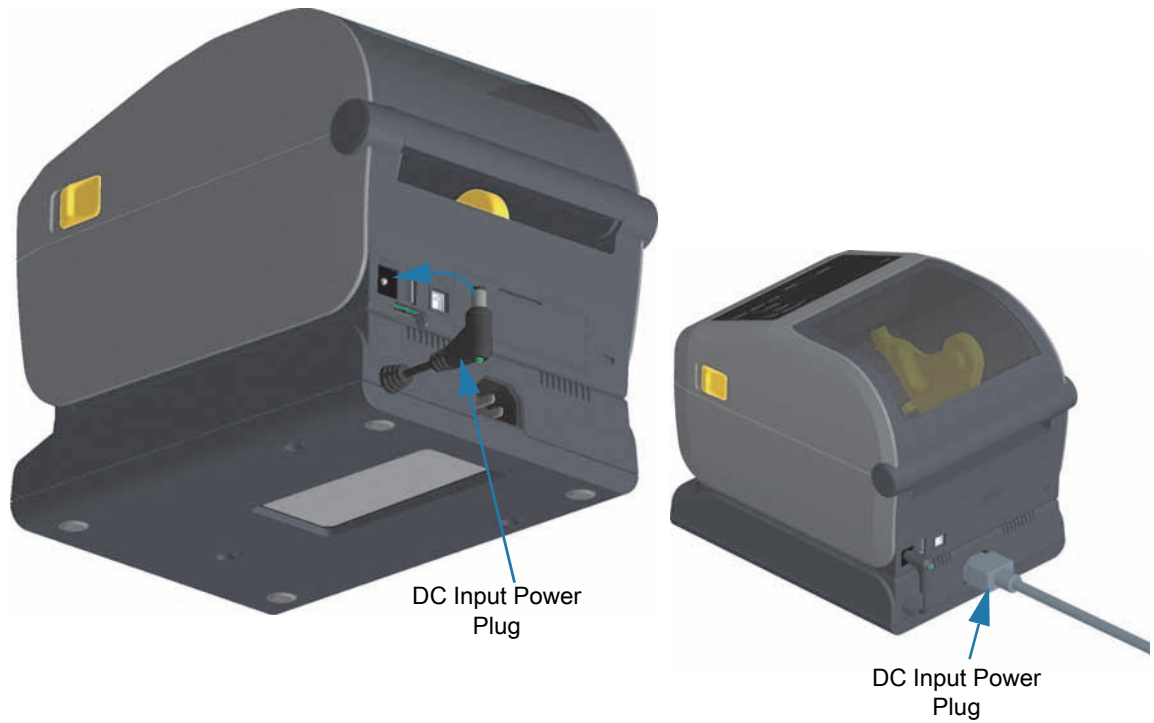


Direct Thermal Printers



Install Hardware Options

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

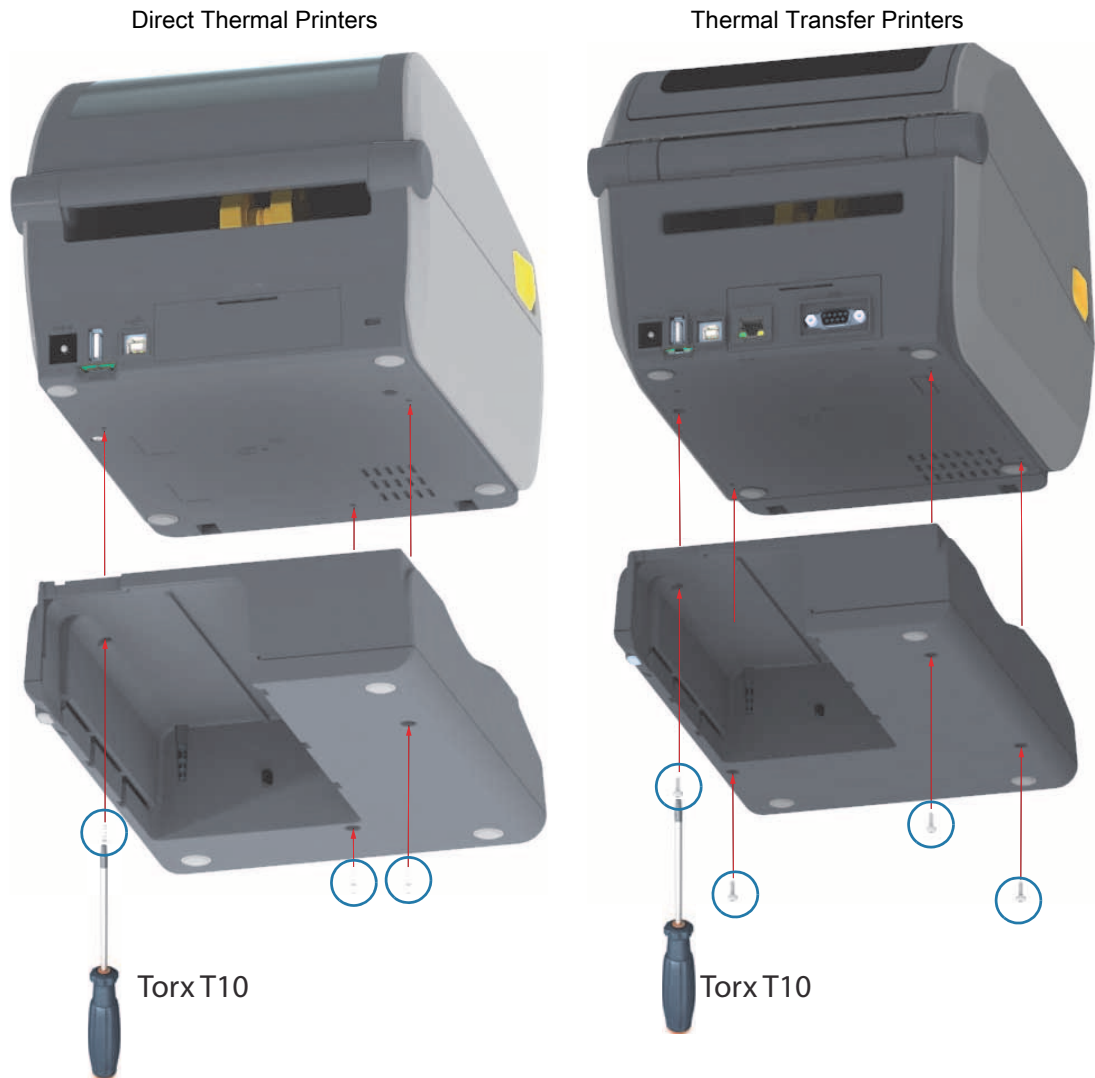


5. Re-connect the AC power cord to the printer power base.

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. The direct thermal printer models attach to the printer with three (3) screws and thermal transfer printer models use four (4) screws.

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 align with recesses in the top of the power base.
3. Use the screws provided to attach the power base to the printer. Three (3) screws for Direct Thermal printers. Four (4) screws for Thermal Transfer printers. Tighten the screws using the Torx wrench supplied in the kit.



Installing the Battery into the Attached Power Base

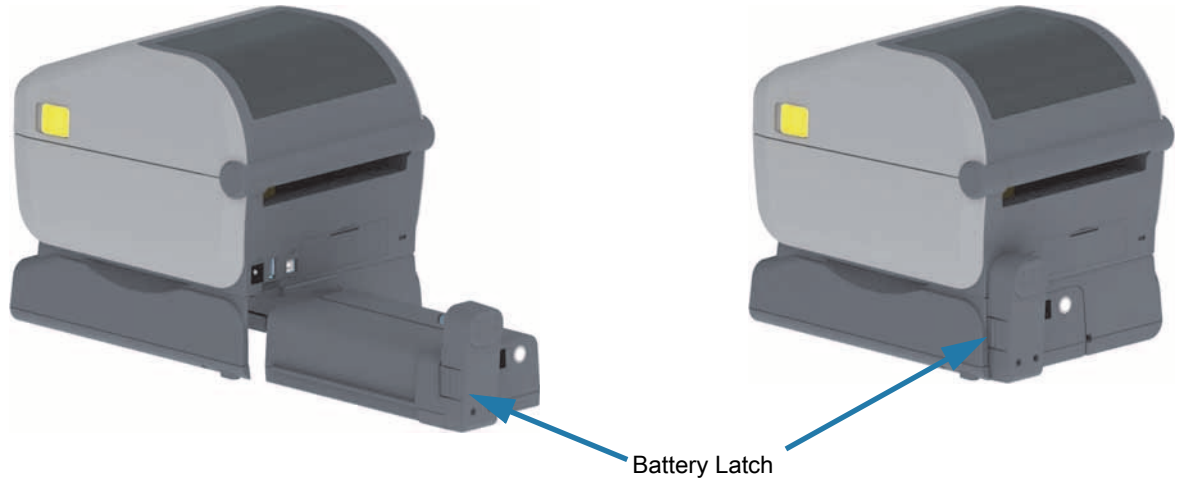


Important • The printer must have an Attached Battery Base installed and securely connected your printer to keep from damaging the printer or battery.

1. Disconnect the printer's external power supply from the DC Power Input located in the rear of the printer.
2. Slide the battery into the battery base's battery slot. 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.

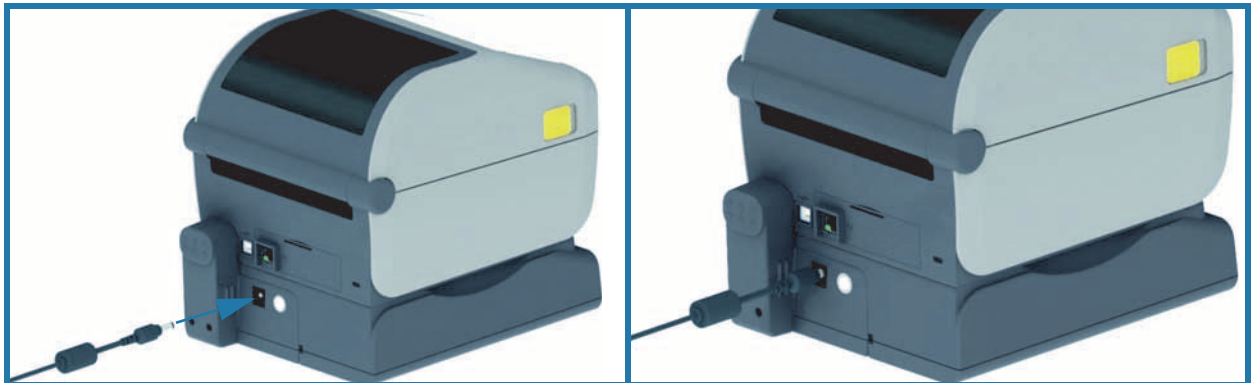
Battery Ready to Install

Printer with Battery installed



Important • 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 it's first use. See [Battery Indicators and Controls](#).to learn how to:
 - Turn the battery on.
 - Discover battery charge saving features and behaviors.
 - Check the battery's charge level and health.
5. The printer will take approximately two hours to reach a full charge. The battery status (health) indicator (lighting bolt) will go from Amber (Charging) to Green (Charged)

Controls and Indicators

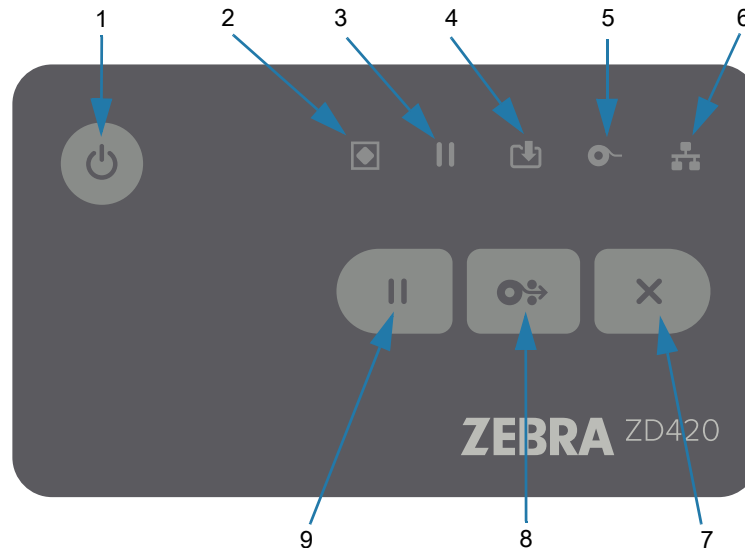
This section discusses the two user control panel variations and their functionality.

User Interface

The primary user controls are found on the front of the printer. The ZD-Series Desktop printers support two user interface options.

- **Standard User Interface** — This interface provides basic control and status needed by an operator. Printer operating status is reported by five (5) icon indicator lights. The icons represent several functional areas of operation. The indicator lights, as a group, provide a wide range of printer status notifications when used in combination. They are visible from a greater distance than you can read on a printer with a display. See the [Meaning of the Indicator Light Patterns](#).
 - This interface supports operator tasks of replacing printing supplies (labels, receipt paper, transfer ribbon, etc.) when prompted by two indicators.
 - Status indicator's icons represent a functional area of printer operation.
 - Status indicator lights typically use color to show the operator the functional status of the printer. The status indicator lights may be off (not lit), red, green, or amber (orange/yellow). Red is 'needs attention' or 'not ready'. Green is for 'ready' or 'functioning'. Amber (orange/yellow) is for busy or active process (data downloading, over-temperature cooling cycle, etc.). An off or un-lit status indicator does not require the operators attention.
 - A status indicator can flash (blink), fade (bright to off), alternate between colors, or remain on in a variety of patterns that denote various printer activities, and operational status as a group.
 - Control buttons are used in various combinations to access internal utilities that calibrate the printer to your media and make limited print settings.
- **LCD User Interface** — This color LCD interface provides easy printer setup, configuration, and is customizable for all user types. The interface includes all the Standard User Interface controls and indicators to provide you with common functionality and behaviors for these Link-OS printer models.
 - The display option provides written printer status and messages. The display supports 19 languages, selectable by the operator or with programming.
 - It has a menu system. Users can make changes to print settings (darkness, speed, etc.), run utilities, and set wired and wireless communication interfaces (Serial, Ethernet, Wi-Fi, etc.) that are installed on your printer.

Standard Interface Controls



- Power Button** — Turns power ON and OFF in the printer. It is 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 will flash on and off in various combinations while the printer does self diagnostics, configuration checks, and integrate optional components which 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. The operator 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](#).
 - 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 • The Power Failure Recovery Mode is only available on printers with a Printer Connectivity Module installed in the printer.



2. **Status Indicator** — Primary status indicator for overall printer health and operational status. This indicator is 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 the Pause button.
 - **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:** There is a 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.



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.

- **Only functional when the printer is in the Pause state.**
- **Pressing the Cancel button once** causes the printer to cancel printing the next format in the print buffer.
- **Pressing and holding the button 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) the FEED button when the printer is not printing, causes the printer to advance media one (1) blank form/format length (label, receipt, tag, ticket, etc.).
- **Advance Multiple Labels** - Pressing and Holding the FEED button 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: `ezpl.reprint_mode`) - The intended purpose of this feature is to allow reprint of a failed media print. If the printer runs out of media (paper, labels, transfer ribbon, etc.), then the printer 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.

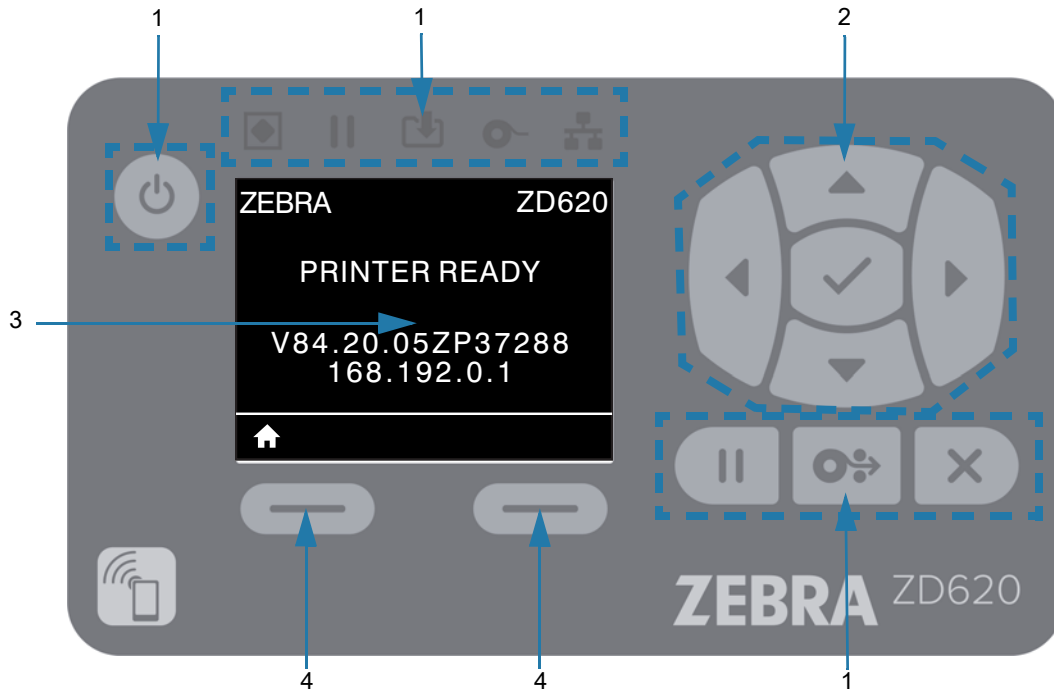


9. **Pause Button** — Pauses print and media movement actions.

- Pressing the Pause button will stop print activities and place the printer into a 'Pause' state. The printer will complete printing a label that is printing before it pauses.
- The Pause indicator will display Amber (orange/yellow) to indicate the Pause state.
- Pressing the Pause button while in Pause state will return 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, then 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.

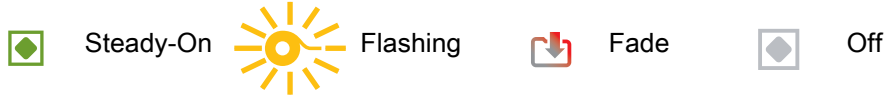


1. **Standard Interface Controls** — Provides visual and operational continuity for users that use both styles of Zebra Link-OS printers.
2. **LCD Navigation Controller and Selector** — Navigate through printer menus and parameter settings on the LCD using the direction ARROW buttons to choose printer 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 button immediately below the HOME icon will change the display to the Menu's Home screen.

Meaning of the Indicator Light Patterns

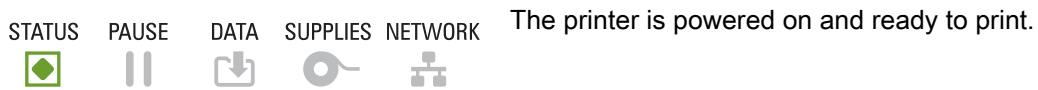
All of the Link-OS 4 inch printers have status indicators. The indicators may be off or on in a variety of lighting patterns of red, green, or amber (orange/yellow). The status indicators can flash (blink), fade (bright to off), alternate between colors, or just remain on. The status information that these lighting patterns represent is detailed in this section.

Indicator States

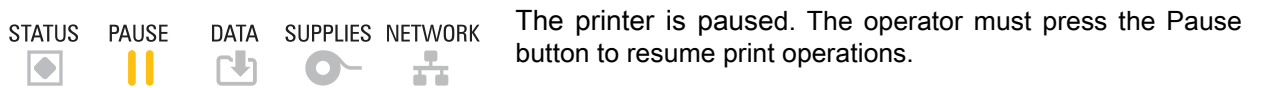


Status - Typical Operating Conditions

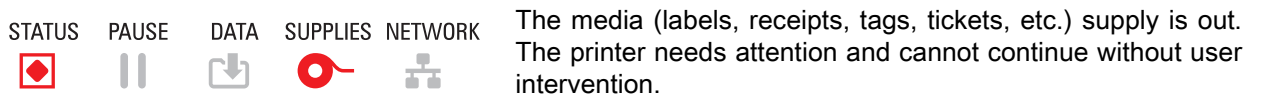
Printer Ready



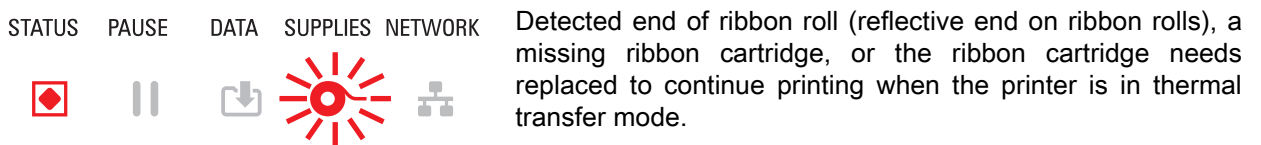
Pause



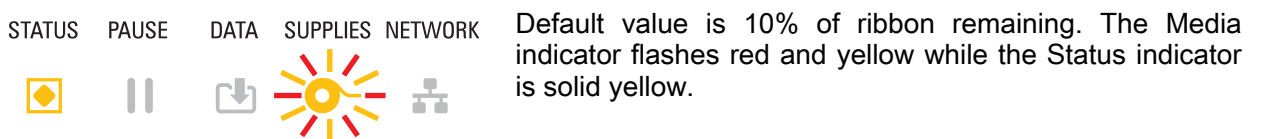
Media Out



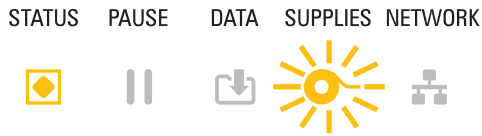
Ribbon Out



Ribbon Low (Ribbon Cartridge Printers Only)



Ribbon In (Ribbon Cartridge Printers Only)



A 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.

Transferring Data



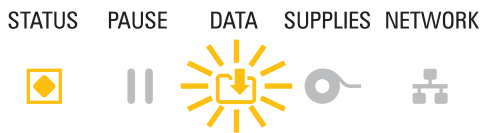
Data communications are in process.

Data Transfers Paused



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



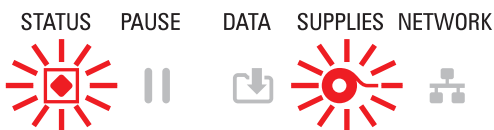
The cover (printhead) is open. The printer needs attention and cannot continue without user intervention.

Cut Error (Binding)



The cutter blade is bound and is not moving properly.

Cartridge Authentication Failed



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



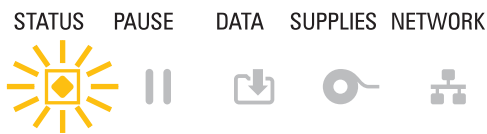
Hot Surface Caution • The printhead may be hot and could cause severe burns. Allow the printhead to cool.

Printhead Over Temp



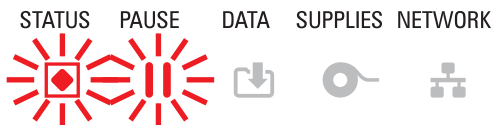
The printhead is over temperature and paused to allow the printhead to cool. The print operation will resume after the printhead has cooled.

Printhead Under Temp



The printhead is under temperature. Typically, the operating environment is below the printer's minimum operational temperature.

Printhead Shutdown



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



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



The printhead was replaced with one that is not a genuine Zebra printhead. Install a genuine Zebra printhead to continue.

Status - Bluetooth Low Energy (BTLE) Option

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

Ethernet (LAN) No Link

STATUS	PAUSE	DATA	SUPPLIES	NETWORK	No Ethernet link is available. NETWORK status is light off

Ethernet (LAN) 100base Link

STATUS	PAUSE	DATA	SUPPLIES	NETWORK	A 100 Base link was found.

Ethernet (LAN) 10base Link











STATUS	PAUSE	DATA	SUPPLIES	NETWORK	A 10 Base link was found.

Ethernet (LAN) Link Error






STATUS	PAUSE	DATA	SUPPLIES	NETWORK	An error condition exists. The printer is not connected to your network.

Status - Wi-Fi (WLAN) Option






Wi-Fi Connecting to WLAN

STATUS	PAUSE	DATA	SUPPLIES	NETWORK	
					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

STATUS	PAUSE	DATA	SUPPLIES	NETWORK	
					The printer is connected to your network and the Wi-Fi signal is strong.

Wi-Fi (WLAN) 10base Link

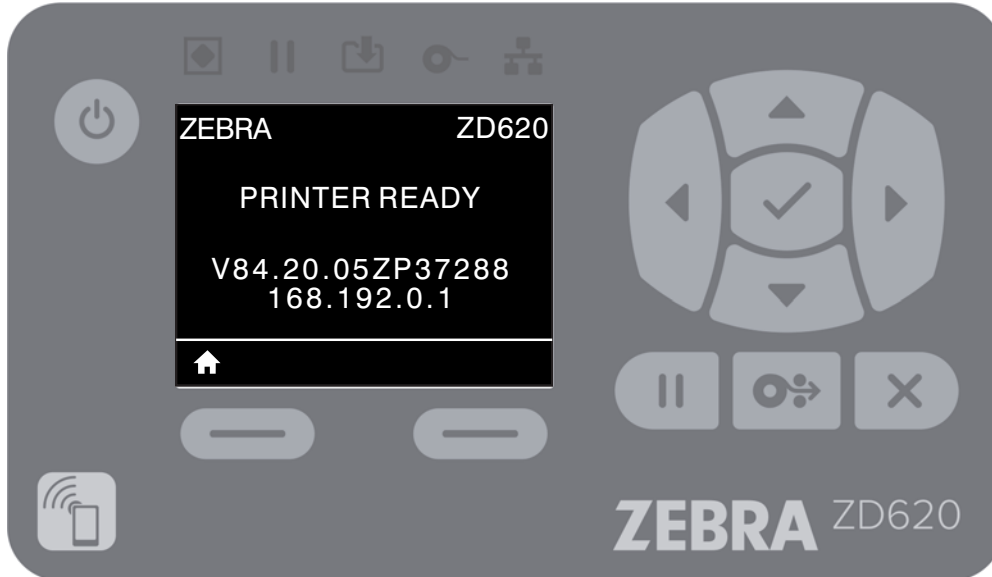
STATUS	PAUSE	DATA	SUPPLIES	NETWORK	
					The printer is connected to your network and the Wi-Fi signal is weak.

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 printer's with the LCD User Interface provides the user printer status and a menu system to configure the printer and run internal utilities. The printer is capable of displaying messages in multiple languages.



The printer's default screen information is shown.

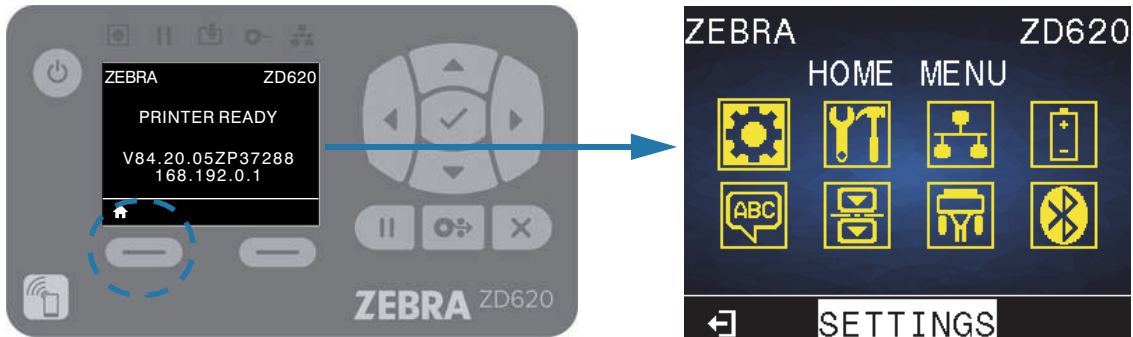
- The top line displays printer model information.
- The center area shows printer status information (customizable) and pop-up messages.
- The two (2) bottom lines show the printer's Firmware version and the printer's IP Address by default. This area can be customized to show different, user selectable information. See [IDLE DISPLAY](#) for a more information.
- The bottom area below the white line are for Action items.

Navigating through Menu Display Screens

This section shows the following:

- The options available for navigating through the screens of the LCD User Interface.
- How to select or modify things shown on the 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.

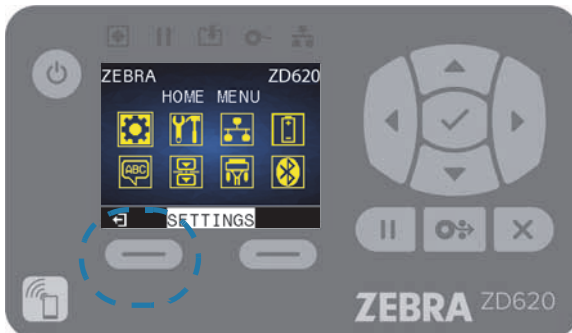


SETTING Menu Icon highlighted



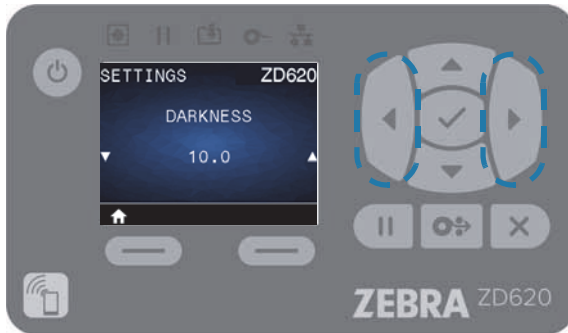
SETTING Menu Icon

- To select the highlighted menu icon and enter the menu, press the center Select (✓) button.



BACK Button

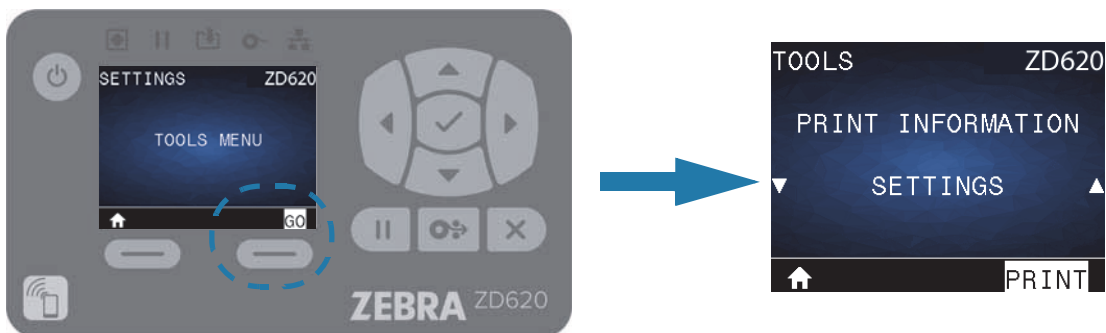
- Press LEFT SELECT to exit the Home menu and return to the Idle Display. The printer automatically returns to the Idle Display after 15 seconds of inactivity in the Home menu.



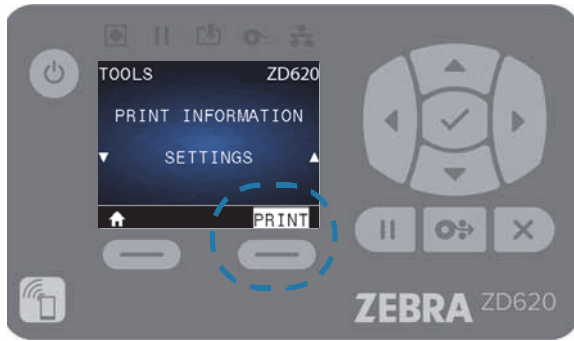
- To scroll through the items in a user menu, press the LEFT ARROW or RIGHT ARROW.



- 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 that you make are saved immediately when you exit the menu item.



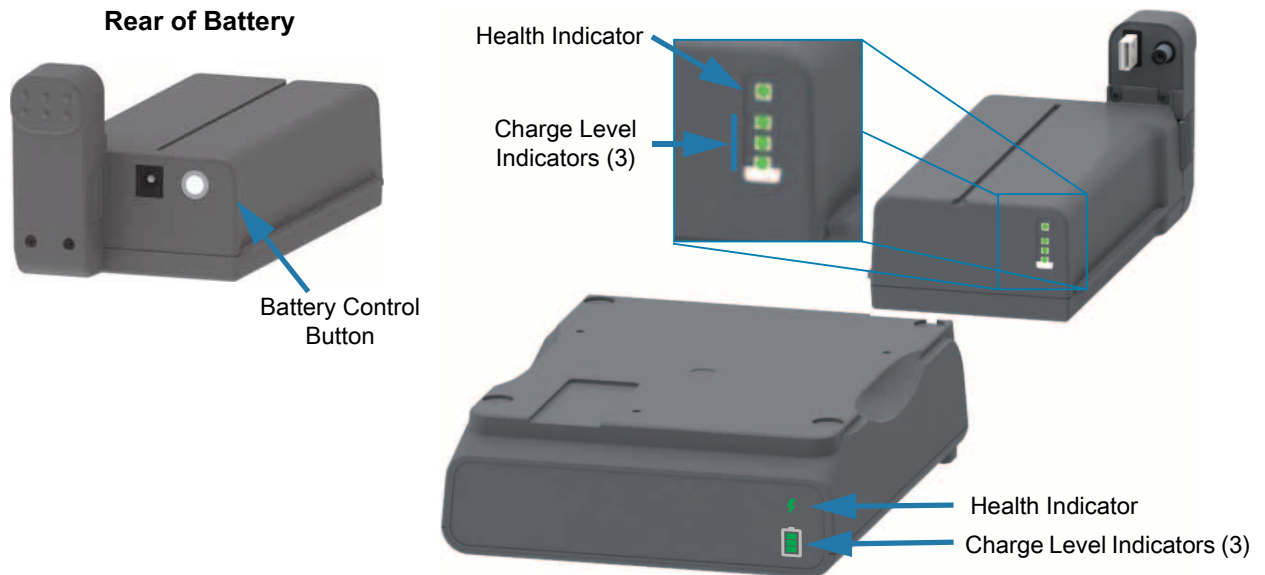
- MENU Shortcuts - When you reach the end of one menu, the next menu will be displayed (an adjacent menu). To go to the next user menu from a menu shortcut, press the SELECT (Checkmark) or press RIGHT SELECT to select the GO (go to menu) action. The display will then display the first menu item of the newly selected menu.



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

Battery Indicators and Controls

The optional printer battery accessory has a simple, one button, 4 LED indicator light user interface to control and display battery status and health. The battery acts as a UPS (uninterruptible power supply) 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](#).



Battery Control Button — The button helps you control the battery, both inside and outside of the printer.

- **Battery On** - Press and release
 - **Wakes up (activates power) the battery from Sleep or Shutdown Modes.** The battery health and charge status are checked. The battery indicators all flash on and off together 3 times. The operator now has one (1) minute to turn the printer on before the battery reverts back to the previous Sleep or Shutdown Mode.
 - **Battery displays the battery level charge during the first ten (10) seconds** after internal battery health checks are complete
 - **Shutdown Mode** - Press and hold the button for 10-11 seconds and release. The battery begins shutdown and approximately 3 seconds later all of the battery LEDs will flash three (3) 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 the [Troubleshooting](#).
- **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 (3) green bars** on, no flashing - Battery is fully charged. (The battery will not start charging)
- **Two (2) green bars on with the top bar flashing.** Less than full charge.
- **One (1) green bar flash - Time to charge your battery!**
- **No bars on - Battery needs charging,** but the Battery Health Indicator flashes when the Battery Control Button is pressed. The printer can not be turned on.
- **Amber** - Charging.

Printer Configuration Menus

This section presents the printer settings that you can change and identifies the tools for changing them.

Adjust Printer Settings

These menu item settings and utilities descriptions include the following:

- The printer's user menus
See the information that follows in this section.
- ZPL and Set/Get/Do (SGD) commands
See the Zebra® Programming Guide for more information.
- The printer's web pages when the printer has an active wired or wireless print server connection
See the Wired and Wireless Print Servers User Guide for more information.











Note • See [About](#) section for this manual, other information and support links for your specific printer model.

Printer Configuration Menus

User Menus

The user menus break the printer configuration into several task based menus. Click any menu item to go to its description in the table. For navigation instructions, see [Navigating through Menu Display Screens](#).

 SETTINGS	 TOOLS	 NETWORK	 BATTERY
<ul style="list-style-type: none"> 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* 	<ul style="list-style-type: none"> 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* 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> BATTERY STATUS LANGUAGE MENU*
 LANGUAGE	 SENSORS	 PORTS	 BLUETOOTH
<ul style="list-style-type: none"> LANGUAGE** COMMAND LANGUAGE COMMAND CHAR CONTROL CHAR DELIMITER CHAR ZPL MODE VIRTUAL DEVICE SENSORS MENU* 	<ul style="list-style-type: none"> SENSOR TYPE MEDIA/RIBBON CAL** PRINT INFORMATION** LABEL SENSOR TAKE LABEL PORTS MENU* 	<ul style="list-style-type: none"> BAUD RATE DATA BITS PARITY HOST HANDSHAKE WML BLUETOOTH MENU* 	<ul style="list-style-type: none"> BLUETOOTH ADDRESS MODE DISCOVERY CONNECTED BT SPEC VERSION MIN SECURITY MODE SETTINGS MENU*
<p>* Denotes a shortcut to the next user menu. ** Appears in multiple user menus for your convenience.</p>			

SETTINGS Menu

DARKNESS



Description: 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, use the [Print Quality Report \(FEED self test\)](#) to determine the best darkness setting.

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



Description: Select the speed, in inches per second (ips), for printing a label. Slower print speeds typically yield better print quality.

Accepted values:

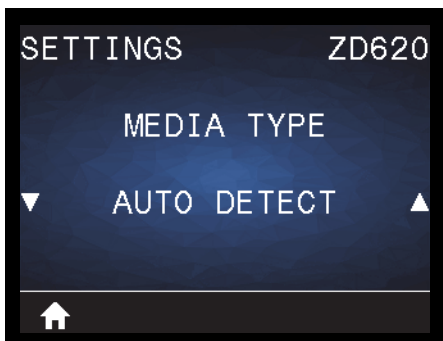
ZD620 203 dpi = 2 to 8 ips
ZD620 300 dpi = 2 to 6 ips
ZD420 203 dpi = 2 to 6 ips
ZD420 300 dpi = 2 to 4 ips

Related ZPL command(s): ^PR

SGD command used: media.speed

Print Server web page: [View and Modify Printer Settings > General Setup > Print Speed](#)

MEDIA TYPE



Description: Select the type of media that you are using.

Accepted values: CONTINUOUS, GAP/WEB, MARK/NOTCH

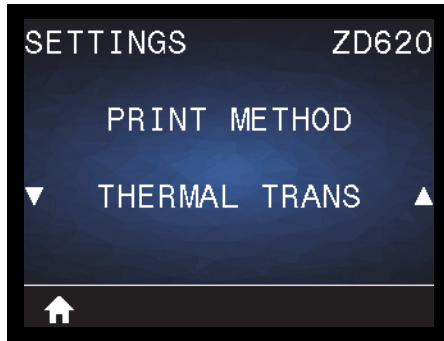
If you select **CONTINUOUS**, you must include a label length in your label format (^LL if you are using ZPL). If you select **GAP/WEB** or **MARK/NOTCH** for various noncontinuous media, the printer FEEDs media to calculate the label length.

Related ZPL command(s): ^MN

SGD command used: ezpl.media_type

Print Server web page: [View and Modify Printer Settings > Media Setup > Media Type](#)

PRINT METHOD



Description: 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: `ezpl.print_method`

Print Server web page: [View and Modify Printer Settings > General Setup > Print Method](#)

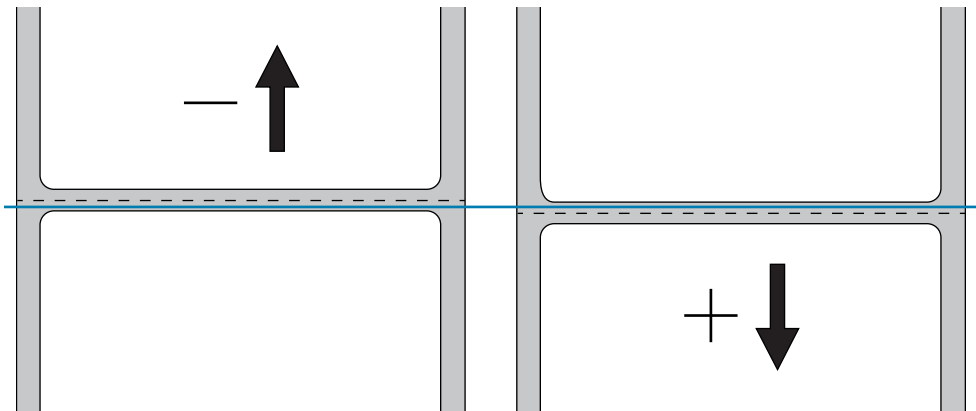
TEAR OFF



Description: 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 command used: `ezpl.tear_off`

Print Server web page: [View and Modify Printer Settings > General Setup > Tear Off](#)

PRINT WIDTH



Description: Specifies the width of the labels being used, in dots. The default value is the maximum width for the printer, based on the printhead's DPI value.

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.

Related ZPL command(s): ^PW

SGD command used: ezpl.print_width

Print Server web page: [View and Modify Printer Settings](#) > [General Setup](#) > [Print Width](#)



Important • Setting the print width too wide wastes formatting memory. Printing off the sides of the label and onto the platen roller may damage the platen.



Note • Setting the width too narrow can result in portions of a label format not being printed on the media.



Note • This setting can affect the horizontal position of the label format if the image was inverted using the ^POI ZPL II command.

PRINT MODE



Description: 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 [Select a Print Mode](#).

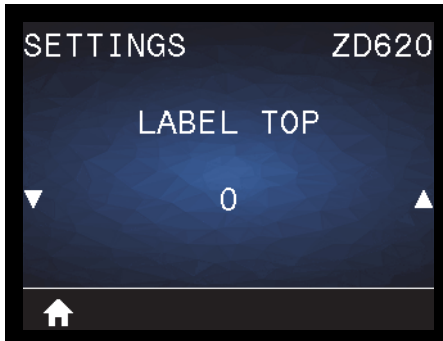
Accepted values: [TEAR-OFF](#), [PEEL-OFF](#), [CUTTER](#)

Related ZPL command(s): ^MM

SGD command used: `media.printmode`

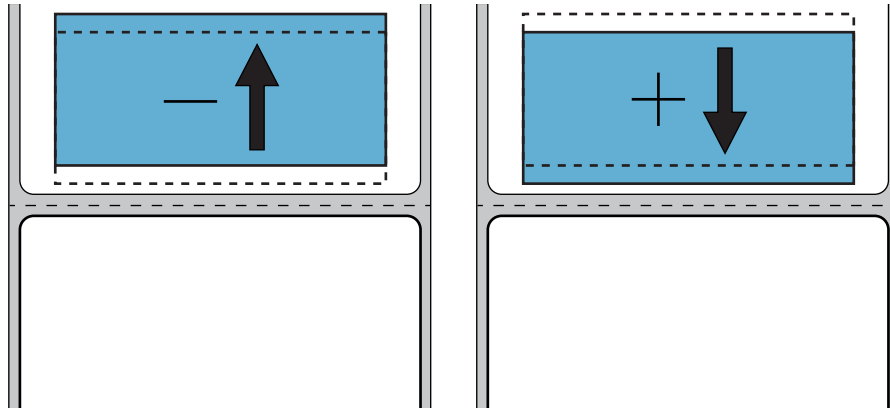
Print Server web page: [View and Modify Printer Settings > General Setup > Print Mode](#)

LABEL TOP



Description: 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

SGD command used: media.printmode

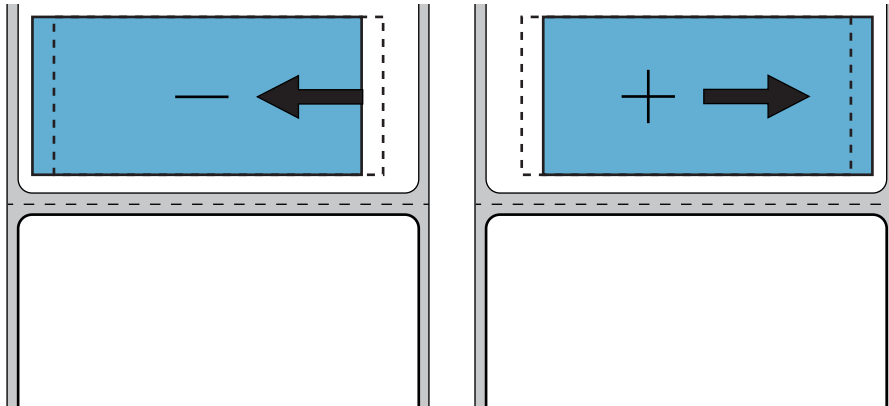
Print Server web page: [View and Modify Printer Settings](#) > [General Setup](#) > [Print Mode](#)

LEFT POSITION



Description: 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: zpl.left_position

Print Server web page: [View and Modify Printer Settings > General Setup > Left Position](#)

REPRINT MODE



Description: When reprint mode is enabled, you can reprint the last label printed by pressing FEED button.

Accepted values: **ON** or **OFF (default)**

Related ZPL command(s): ^JZ

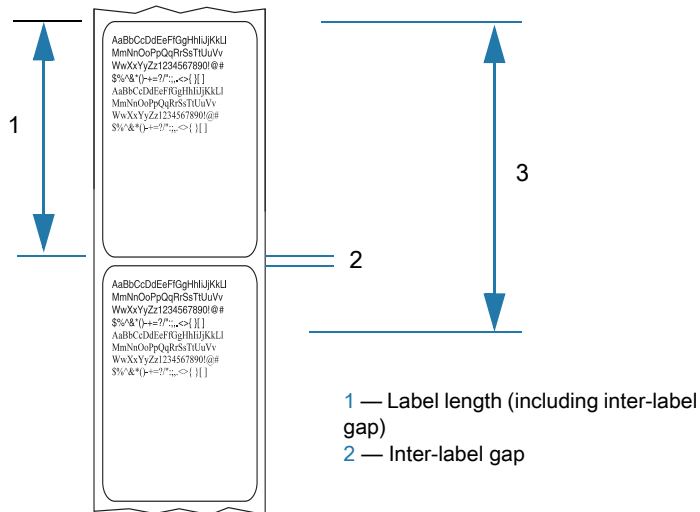
SGD command used: zpl.left_position

Print Server web page: [Not supported at this time](#)

LABEL LENGTH MAX



Description: 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, the printer assumes that continuous media is loaded.



Set the value to the longest label used with the printer plus 1.0 inch (25.4 mm) greater than the maximum length label. Ideally, use a value 2 times the max. label length plus an inch.

Accepted values: **1-39** (inches), **39** default

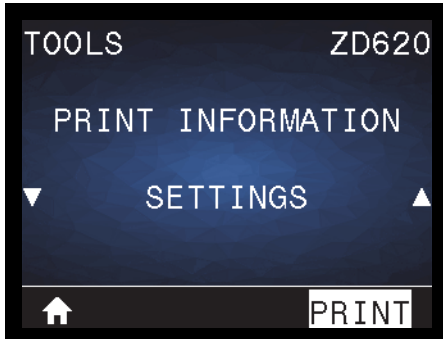
Related ZPL command(s): ^ML (^LL, ^PW)

SGD command used: `ezpl.label_length_max`

Print Server web page: [View and Modify Printer Settings > Media Setup > Maximum Length](#)

TOOLS Menu

PRINT INFORMATION



Description: Print the selected information (1 of 7 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](#).
- **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 [Manual Media Calibration](#).

Related ZPL command(s):

- SETTINGS: ~WC
- NETWORK: ~WL
- SENSOR PROFILE: ~JG
- Others: ^WD

SGD command used: Not applicable

Print Server web page: [View and Modify Printer Settings](#) > [Print Listings on Label](#)

Printer Configuration Menus

Figure 1 Sample Printer Configuration Report **Figure 1** Sample Network Configuration Report

PRINTER CONFIGURATION	
Zebra Technologies ZTC Z0620-203dpi ZPL 50J164202531	
+15.0.....	DARKNESS
LOW.....	DARKNESS SWITCH
8.0 IPS.....	PRINT SPEED
+000.....	TEAR OFF ADJUST
TEAR OFF.....	PRINT MODE
CONTINUOUS.....	MEDIA TYPE
TRANSMISSIVE.....	SENSOR SELECT
DIRECT-THERMAL.....	PRINT METHOD
830.....	PRINT WIDTH
2030.....	LABEL LENGTH
39.0IN 988MM.....	MAXIMUM LENGTH
MAINT. OFF.....	EARLY WARNING
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
045.....	WEP SENSOR
096.....	MEDIA SENSOR
128.....	TAKE LABEL
062.....	MARK SENSOR
004.....	MARK MED SENSOR
046.....	TRANS GAIN
034.....	TRANS LED
049.....	MARK GAIN
100.....	MARK LED
DPCS/WFXM.....	MODES ENABLED
.....	MODES DISABLED
832 8/MM FULL.....	RESOLUTION
4.0.....	LINK-OS VERSION
V84.20.072P37536 <-	FIRMWARE
1.3.....	XML SCHEMA
6.5.0 0.770.....	HARDWARE ID
8192k.....R:	RAM
65536k.....E:	ONBOARD FLASH
NONE.....	FORMAT CONVERT
FW VERSION.....	IDLE DISPLAY
06/08/17.....	RTC DATE
07:07.....	RTC TIME
DISABLED.....	ZBI
2.1.....	ZBI VERSION
READY.....	ZBI STATUS
178 LABELS.....	NONRESET CNTR
178 LABELS.....	RESET CNTR1
178 LABELS.....	RESET CNTR2
1,290 IN.....	NONRESET CNTR
1,290 IN.....	RESET CNTR1
1,290 IN.....	RESET CNTR2
3,277 CM.....	NONRESET CNTR
3,277 CM.....	RESET CNTR1
3,277 CM.....	RESET CNTR2
002 WIRED.SERIAL.....	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 Z0620-203dpi 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
172.029.001.003.....	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:a4:89:17:b8..	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.....	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 ipi.....	FIRMWARE
02/13/2015.....	DATE
on.....	DISCOVERABLE
3.0/4.0.....	RADIO VERSION
on.....	ENABLED
AC:3F:A4:89:17:B9..	MAC ADDRESS
50J164202531.....	FRIENDLY NAME
no.....	CONNECTED
1.....	MIN SECURITY MODE
nc.....	CONN SECURITY MODE
supported.....	iOS
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

IDLE DISPLAY



Description: 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](#)

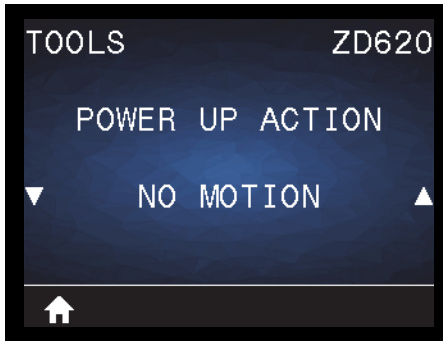
Related ZPL command(s): Not Applicable

SGD command used:

- `device.idle_display_format`
- `device.idle_display_value`

Print Server web page: [Not Applicable](#)

POWER UP ACTION



Description: 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): ^MF

SGD command used: `ezp1.power_up_action`

Print Server web page: [View and Modify Printer Settings > Calibration](#)

HEAD CLOSE ACTION



Description: Set the action for the printer to take when you close the printhead.

Accepted values:

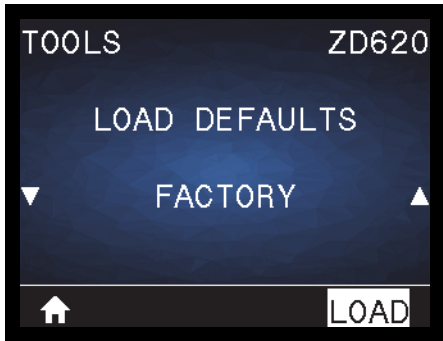
- **CALIBRATE**—Adjusts sensor levels and thresholds, determines the label length, and FEEDs the media to the next web.
- **FEED**—FEEDs the labels to the first registration point.
- **LENGTH**—Determines the label length using current sensor values, and FEEDs the media to the next web.
- **NO MOTION**—Tells 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 > Calibration](#)

LOAD DEFAULTS



Description: 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):

- FACTORY: ^JUF
- NETWORK: ^JUN
- LAST SAVED: ^JUR

SGD command used: Not Applicable

Print Server web page: [View and Modify 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](#)

MEDIA/RIBBON CAL



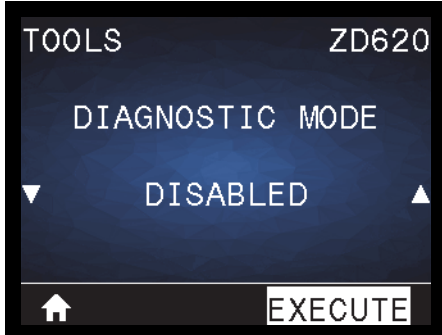
Description: Calibrate the printer to adjust the sensitivity of the media sensors.

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



Description: Use this diagnostics tool to cause the printer to output the hexadecimal values for all data received by the printer. For more information, see [Communication Diagnostics Test](#).

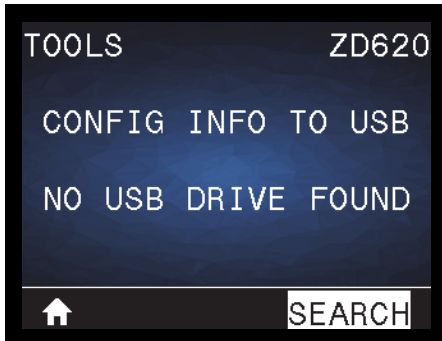
Accepted values: **PRINT**, **E: DRIVE**, **USB MEMORY** or **DISABLED**

Related ZPL command(s): ~JD to enable, ~JE to disable

SGD command used: `device.diagnostic_print`

Print Server web page: The calibration procedure cannot be initiated through the web pages.

CONFIG INFO TO USB



Description: Allows the operator 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 with xxx = 000 to 999) to the USB drive in the printer USB Host port and formatted per information supplied in [USB Host Port and Link-OS Usage Examples](#). The printer configuration report files names will increment with each report written to the USB drive (OUT001.txt increments to OUT002.txt the next time the file is written).

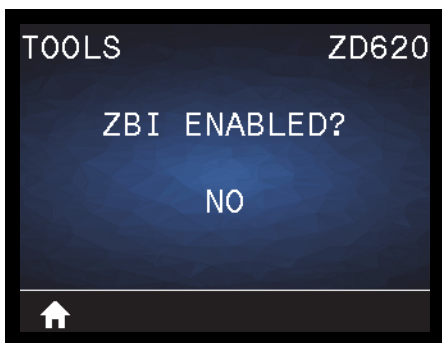
Accepted values: **SEARCH** (NO USB DRIVE FOUND on display), **WRITE** (if USB drive is installed)

Related ZPL command(s): ^HH (equivalent information reported)

SGD command used: [file.capture_response.begin](#), [file.capture_response.end](#) and [file.capture_response.destination](#)

Print Server web page: [Not Applicable](#)

ZBI ENABLED?



Description: 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** or **YES**

SGD command used: **zbi.key** (identifies if the ZBI 2.0 option is enabled or disabled on the printer)

Print Server web page: [Not Applicable](#)

RUN ZBI PROGRAM



Description: 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** or **PROGRAM FILE NAMES**

Related ZPL command(s): ^JI, ~JI

SGD command used: zbi.control.run

Print Server web page: [Printer Home Page > Directory Listing](#)

STOP ZBI PROGRAM



Description: 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** or **PROGRAM FILE NAMES**

Related ZPL command(s): ~JQ

SGD command used: zbi.control.terminate

Print Server web page: [Printer Home Page](#) > [Directory Listing](#)

PRINT USB FILE



Description: Select files to print from a USB Flash drive. See the exercises in [Using the USB Hosts Port and the NFC Capabilities](#) 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.
2. The printer lists available files. **SELECT ALL** is available to print all available files on the USB Flash drive.
3. Use the UP ARROW or DOWN ARROW to select a file from this menu.
4. Press RIGHT SELECT to select **PRINT**.

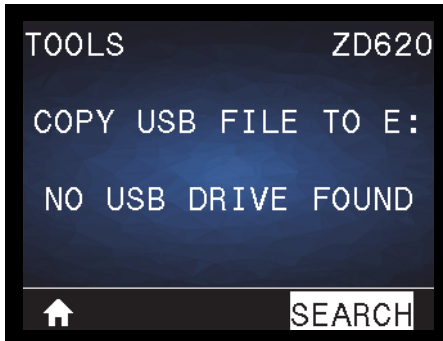
Accepted values: **NONE**, **SELECT ALL** or **PROGRAM FILE NAMES**

Related ZPL command(s): **Not Applicable**

SGD command used: `usb.host.read_list`

Print Server web page: **Not Applicable**

COPY USB FILE TO E:



Description: Select files to copy to the printer from a USB Flash drive. See the exercises in [Using the USB Hosts Port and the NFC Capabilities](#) for an exercise using this capability.

To copy files to the printer from a USB Flash drive:

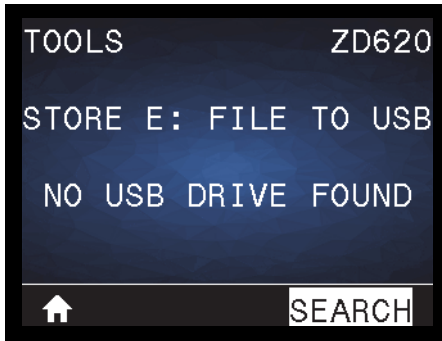
1. Insert a USB flash drive into the printer's USB host port.
2. The printer lists available files. **SELECT ALL** is available to copy all available files from the USB Flash drive.
3. Use the UP ARROW or DOWN ARROW to select a file from this menu.
4. Press RIGHT SELECT to select **STORE**.

Accepted values: **NONE**, **SELECT ALL** or **PROGRAM FILE NAMES**

SGD command used: `usb.host.read_list`

Print Server web page: **Not Applicable**

STORE E: FILE TO USB



Description: Select files from the printer to store on a USB Flash drive. See the exercises in [Using the USB Hosts Port and the NFC Capabilities](#) for an exercise using this capability.

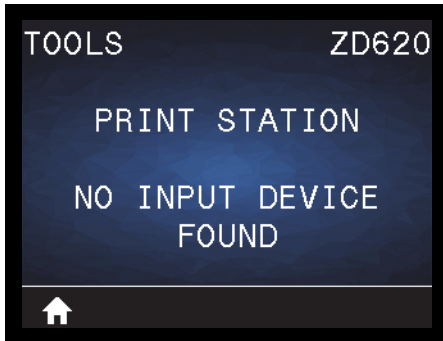
To copy files from the printer to a USB Flash drive:

1. Verify that a USB flash drive is inserted into the printer's USB host port.
2. The printer lists available files. **SELECT ALL** is available to store all files available from the printer on the USB Flash drive.
3. Use the UP ARROW or DOWN ARROW to select a file from this menu.
4. Press RIGHT SELECT to select **STORE**.

Accepted values: **NONE**, **SELECT ALL** or **PROGRAM FILE NAMES**

SGD command used: `usb.host.write_list`

PRINT STATION



Description: 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 [USB Host Port and Link-OS Usage Examples](#) for an exercise using this capability.

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.

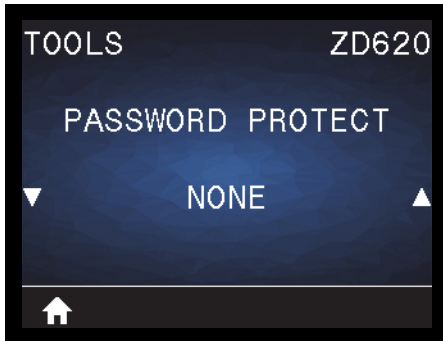
For more information about using the ^FN command or the SGD commands related to this feature, refer to the **Zebra Programming Guide**. You can download a copy of the manual from: www.zebra.com/manuals/.

Accepted values: **NO INPUT DEVICE FOUND**, **NONE**, or **PROGRAM FILE NAMES**

SGD command 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



Description: Select the level of password protection for user menu items. **1234** is the default password.

Accepted values: **NONE**, **SELECTED**, **ALL**

Related ZPL command(s): ^KP (to change the printer password)

PRINT TEST FORMAT



Description: 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 iprinthead elements not functioning.

SGD command used:

`print.troubleshooting_label_choices` (specifies the type of label)

`print.troubleshooting_label_print` (prints the label)

NETWORK

ACTIVE PRINT SERVER



Description: View whether the **WIRED** or **WIRELESS** print server is currently active.

PRIMARY NETWORK



Description: View or modify whether the **WIRED** or **WIRELESS** print server is considered primary. You may select which one is primary.

Accepted values: **WIRED** or **WIRELESS**

SGD command used: ip.primary_network

WIRED IP ADDRESS



Description: 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](#)).

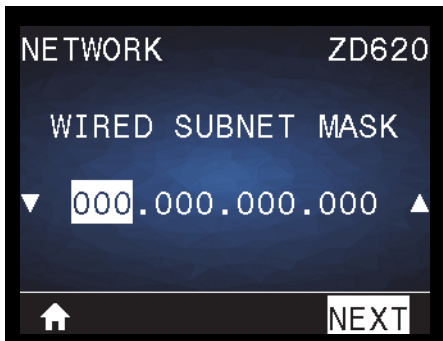
Accepted values: 000 to 255 for each field

Related ZPL command(s): ^ND

SGD command used: internal_wired.ip.addr

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [TCP/IP Settings](#)

WIRED SUBNET MASK



Description: 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](#)).

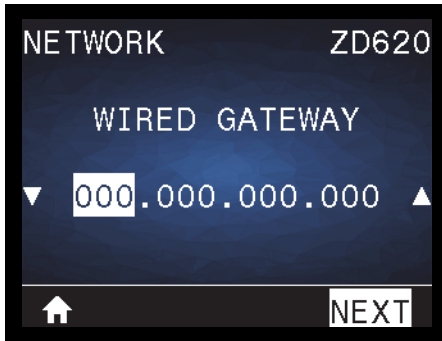
Accepted values: 000 to 255 for each field

Related ZPL command(s): ^ND

SGD command used: internal_wired.ip.netmask

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [TCP/IP Settings](#)

WIRED GATEWAY



Description: 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](#)).

Accepted values: 000 to 255 for each field

Related ZPL command(s): ^ND

SGD command used: internal_wired.ip.gateway

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [TCP/IP Settings](#)

WIRED IP PROTOCOL



Description: 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.



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: internal_wired.ip.protocol

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [TCP/IP Settings](#)

WIRED MAC ADDRESS



Description: View the Media Access Control (MAC) address of the wired print server.

SGD command used: `internal_wired.mac_addr`

Printer Web page: [View and Modify Printer Settings > Network Communications Setup > TCP/IP Settings](#)

WLAN IP ADDRESS



Description: 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](#)).

Accepted values: 000 to 255 for each field

Related ZPL command(s): ^ND

SGD command used: `ip.addr`, `wlan.ip.addr`

Printer Web page: [View and Modify Printer Settings > Network Communications Setup > Wireless Setup](#)

WLAN SUBNET MASK



Description: 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](#)).

Accepted values: 000 to 255 for each field

Related ZPL command(s): ^ND

SGD command used: wlan.ip.netmask

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [Wireless Settings](#)

WLAN GATEWAY



Description: 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](#)).

Accepted values: 000 to 255 for each field

Related ZPL command(s): ^ND

SGD command used: wlan.ip.gateway

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [Wireless Setup](#)

WLAN IP PROTOCOL



Description: 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

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [Wireless Setup](#)

WLAN MAC ADDRESS



Description: View the Media Access Control (MAC) address of the wireless print server.

SGD command used: wlan.mac_addr

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [Wireless Setup](#)

ESSID



Description: 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

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [Wireless Setup](#)

CHANNEL

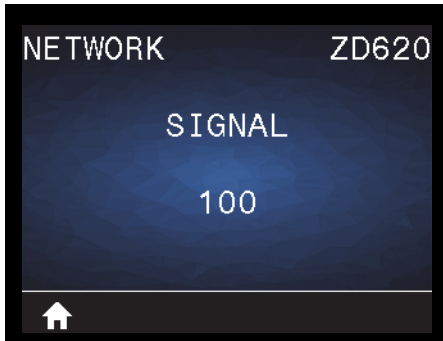


Description: View the wireless channel being used when the wireless network is active and authenticated.

SGD command used: wlan.channel

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [Wireless Setup](#)

SIGNAL

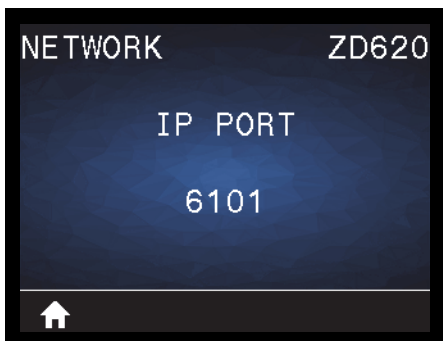


Description: View the wireless signal strength when the wireless network is active and authenticated.

SGD command used: wlan.signal_strength

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [Wireless Setup](#)

IP PORT

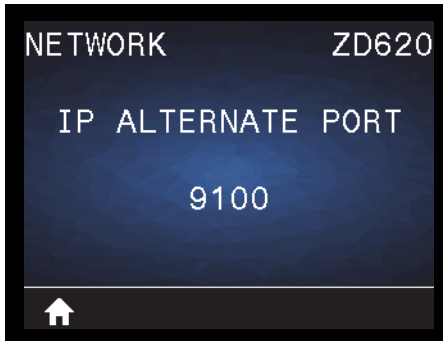


Description: This printer setting refers to the internal wired print servers port number that the TCP print service is listening on. Normal TCP communications from the host should be directed to this port.

SGD command used: internal_wired.ip.port

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [TCP/IP Settings](#)

IP ALTERNATE PORT



Description: This command sets the port number of the alternate TCP port.

SGD command used: `internal_wired.ip.port_alternate`

Printer Web page: [View and Modify Printer Settings](#) > [Network Communications Setup](#) > [TCP/IP Settings](#)



Note • Print servers supporting this command will monitor both the primary port and the alternate port for connections at the same time.

RESET NETWORK



Description: This option resets the wired or wireless print server and saves any changes that you made to any network settings.



Important • The print server must be reset to allow changes to the network settings to take effect.

Related ZPL command(s): `~WR`

SGD command used: `device.reset`

Print Server web page: [Print Server Settings](#) > [Reset Print Server](#)

VISIBILITY AGENT



Description: 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 "Opting Out of the Asset Visibility Agent" application note at <http://www.zebra.com>.

Accepted values: ON or OFF

SGD command used: `weblink.zebra_connector.enable`

Printer Web page: [View and Modify Printer Settings](#) > [Network Configuration](#) > [Cloud Connect Settings](#)

BATTERY Menu

BATTERY STATUS



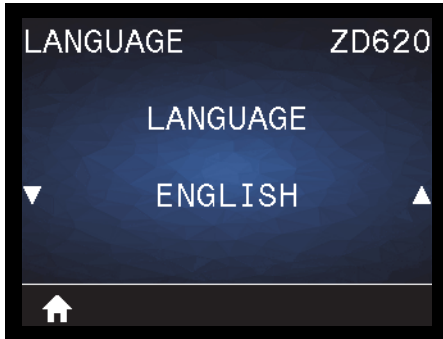
Description: Display the status of the Battery subsystem of the printer.

This menu item is decremented as final design of the battery does not include communicating to battery or this menu item.

Accepted values: BATTERY NOT PRESENT

LANGUAGE Menu

LANGUAGE



Description: Change the language that the printer displays as necessary. This change affects the text shown on the following:

- the Home menu
- the user menus
- error messages
- the printer configuration report, the network configuration report, and other reports that you can select to print through the user menus



Important • The print server must be reset to allow changes to the network settings to take effect.

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](#)



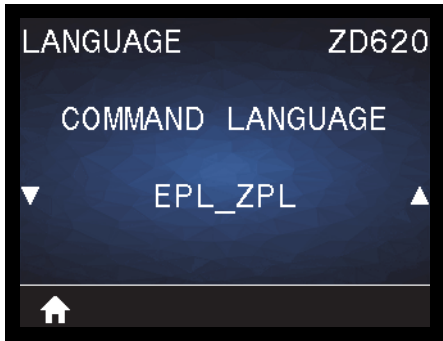
Note • The selections for this parameter are displayed in the actual languages to make it easier for you to find one that you are able to read.

Related ZPL command(s): ^KL

SGD command used: `display.language`

Print Server web page: [View and Modify Printer Settings](#) > [General Setup](#) > [Language](#)

COMMAND LANGUAGE



Description: 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).

Acceptable values:

- [EPL_ZPL \(EZPL\)](#)
- [Hybrid_XML_ZPL](#)
- [EPL](#)

COMMAND CHAR



Description: 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.



Important • You cannot 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.

Acceptable values: 00 to FF hexadecimal

Related ZPL command(s): ^CC or ~CC

SGD command used: zp1.caret

Print Server web page: [View and Modify Printer Settings > ZPL Control](#)

CONTROL CHAR



Description: 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.



Important • You cannot use the same hex value for the format command prefix, control character, and 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.

Acceptable values: 00 to FF hexadecimal

Related ZPL command(s): ^CT or ~CT

SGD command used: `zpl.control_character`

Print Server web page: [View and Modify Printer Settings > ZPL Control](#)

DELIMITER CHAR



Description: 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.



Important • You cannot use the same hex value for the format command prefix, control character, and 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.

Acceptable values: 00 to FF hexadecimal

Related ZPL command(s): ^CD or ~CD

SGD command used: zpl.delimiter

Print Server web page: [View and Modify Printer Settings > ZPL Control](#)

ZPL MODE



Description: 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.

Acceptable values: [ZPL II](#) or [ZPL](#)

Related ZPL command(s): ^SZ

SGD command used: `zpl.zpl_mode`

Print Server web page: [View and Modify Printer Settings > ZPL Control](#)

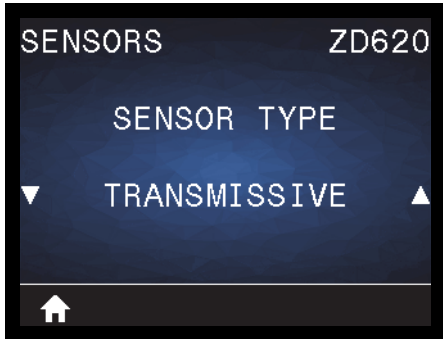
VIRTUAL DEVICE



Description: 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

SENSOR TYPE



Description: 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.

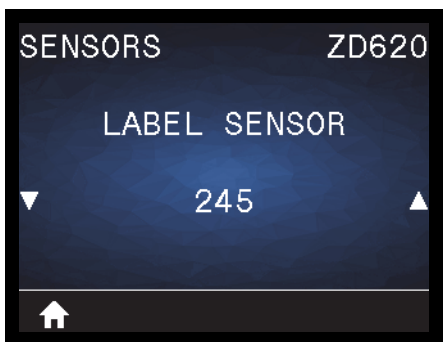
Acceptable values: [TRANSMISSIVE](#) or [REFLECTIVE](#)

Related ZPL command(s): ^JS

SGD command used: device.sensor_select

Print Server web page: [View and Modify Printer Settings > Media Setup](#)

LABEL SENSOR



Description: Set the sensitivity of the label sensor.



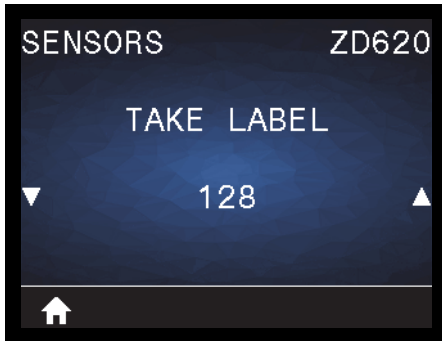
Important • This value is set during sensor calibration. Do not change this setting unless you are told to do so by Zebra Technical Support or by an authorized service technician.

Acceptable values: 0 to 255

SGD command used: ezpl.label_sensor

Print Server web page: [View and Modify Printer Settings > Calibration](#)

TAKE LABEL



Description: 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.

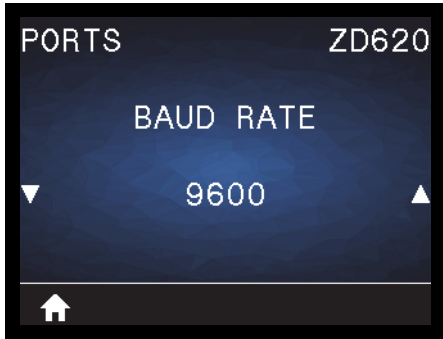
Acceptable values: 0 to 255

SGD command used: `ezpl.take_label`

Print Server web page: [View and Modify Printer Settings](#) > [Calibration](#)

PORTS

BAUD RATE



Description: Select the baud value that matches the one being used by the host computer.

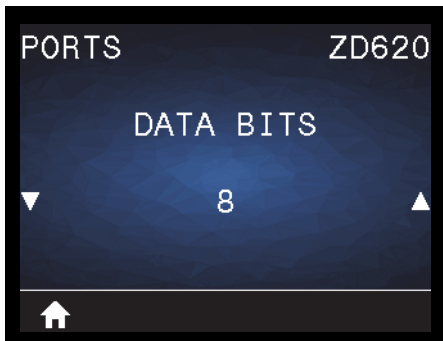
Acceptable values: [115200](#), [57600](#), [38400](#), [28800](#), [19200](#), [14400](#), [9600](#), [4800](#)

Related ZPL command(s): ^SC

SGD command used: comm.baud

Print Server web page: [View and Modify Printer Settings > Serial Communications Setup](#)

DATA BITS



Description: Select the data bits value that matches the one being used by the host computer.

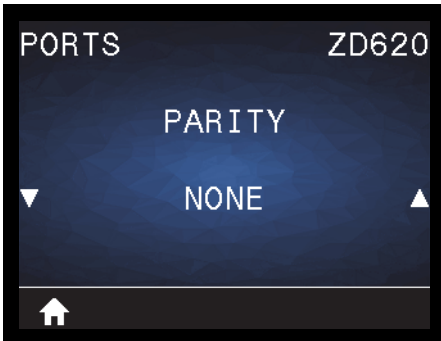
Acceptable values: [7](#) or [8](#)

Related ZPL command(s): ^SC

SGD command used: comm.data_bits

Print Server web page: [View and Modify Printer Settings > Serial Communications Setup](#)

PARITY



Description: Select the parity value that matches the one being used by the host computer.

Acceptable values: NONE, EVEN, ODD

Related ZPL command(s): ^SC

SGD command used: comm.parity

Print Server web page: [View and Modify Printer Settings > Serial Communications Setup](#)

HOST HANDSHAKE



Description: Select the handshake protocol that matches the one being used by the host computer.

Acceptable 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](#)

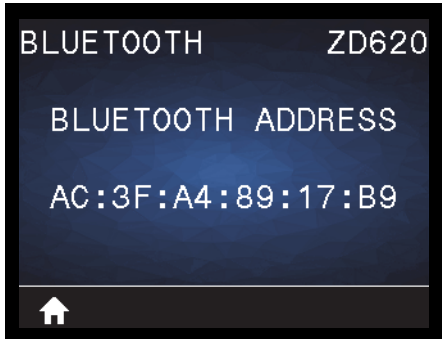
WML



Description: View the Wireless Markup Language (WML) version. This value cannot be changed.

BLUETOOTH

BLUETOOTH ADDRESS



Description: View the printer's Bluetooth MAC Address

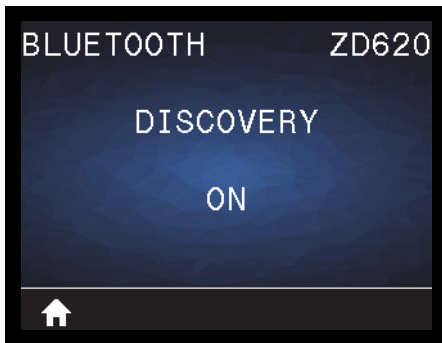
SGD command used: bluetooth.address

MODE



Description: View the Bluetooth connection pair printer's device type—Slave (typical) or Master.

DISCOVERY



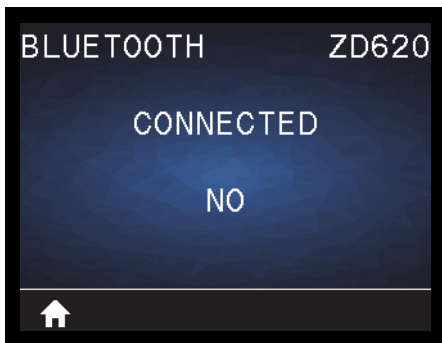
Description: Select if the printer is “Discoverable” for Bluetooth device pairing.

Acceptable values:

- **ON**—Enables Bluetooth discoverable mode.
- **OFF**—Disables Bluetooth discoverable mode.

SGD command used: `bluetooth.discoverable`

CONNECTED



Description: View the Bluetooth connection status to its paired device (Yes or No).

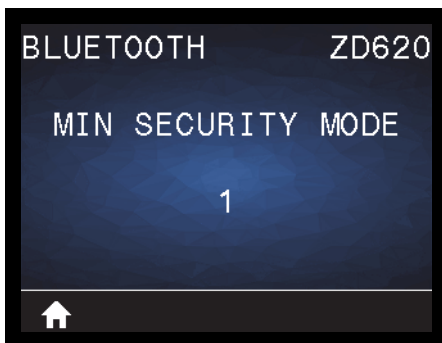
BT SPEC VERSION



Description: View the Bluetooth operational specification level.

SGD command used: `bluetooth.radio_version`

MIN SECURITY MODE



Description: 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 (2) 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

- Install any printer hardware options first. See [Install Hardware Options](#).
- 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.
- Select and prepare media for your printer.
- Load the media.
- Turn the printer ON. Calibrate the media with a SmartCal Media calibration.
- Print a 'Configuration Report' to verify basic printer operation.
- Turn the printer 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
 - Optional Ethernet (LAN)
- Attach the printer cable to the network or host system (printer OFF).
- Begin second phase of printer setup: typically [Setup for Windows® OS](#).

Select a Location for the Printer

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

Select a location for the printer that meets these conditions:

- **Surface:** The surface where the printer will be located must be solid, level, and of sufficient size and strength to hold the printer with media.
- **Space:** The area where the printer will be located must include enough space for opening the printer (media access and cleaning), and for printer access to connectivity and power cords. To allow for proper ventilation and cooling, leave open space on all sides of the printer.



Important • Do not place any padding or cushioning material under or around the base of the printer because this restricts air flow and could cause the printer to overheat.

- **Power:** Put the printer close to an easily accessible power outlet.
- **Data Communication Interfaces:** Please 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:** 32° to 104°F (0° to 40°C)
 - **Operational Humidity:** 20 to 85% non-condensing
 - **Non-Operational Temperature:** -40° to 140°F (-40° to 60°C)
 - **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 - [Installing the Serial Port Module](#)
- Internal Ethernet (LAN) Module - [Installing the Internal Ethernet \(LAN\) Module](#)
- Label Dispenser (Peel-Off Liner and Present Label for Operator) - [Installing the Label Dispenser](#)
- Linerless media cutter - [Installing the Standard Media Cutter](#)
- Linerless Media Tear-Off bezel- [Installing the Label Dispenser](#)
- General purpose media cutter - [Installing the Standard Media Cutter](#)
- [Media Roll Core Size Adapters](#) for 38.1 mm (1.5 inch), 50.8 mm (2.0 inch), or 76.2 (3.0 inch) I.D. media cores.
- [Print Resolution Upgrade Kits](#) (200 and 300 dpi for standard and Linerless media)

Attaching Power

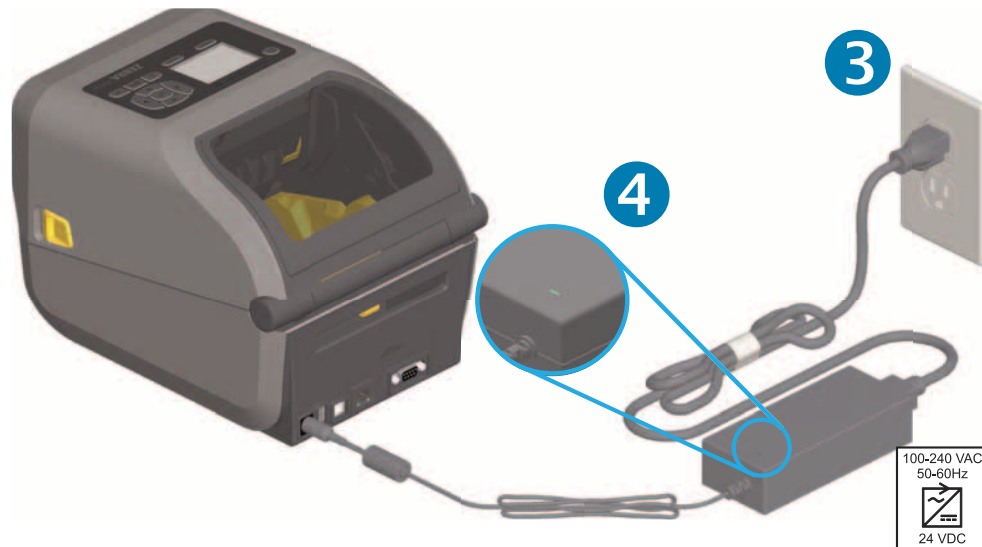
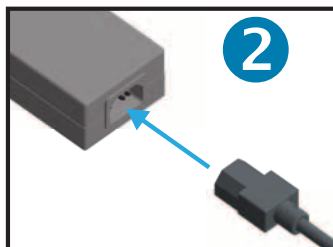


Caution • Never operate the printer and power supply in an area where they can get wet. Serious personal injury could result!



Note • 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 that AC outlet end of the power cord's plug type can vary by region.
4. The active power light will turn on green if power is on at the AC outlet.



Important • Ensure the appropriate power cord with a three (3) 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.

Getting Ready to Print

The printer setup cannot be completed without media. The media may be labels, tags, tickets, receipt paper, fan-fold stacks, tamper proof labels, etc. Ideally choose the same media used for normal operation. This will help you identify any setup and real application issues while using this guide. The printer does not come with media.

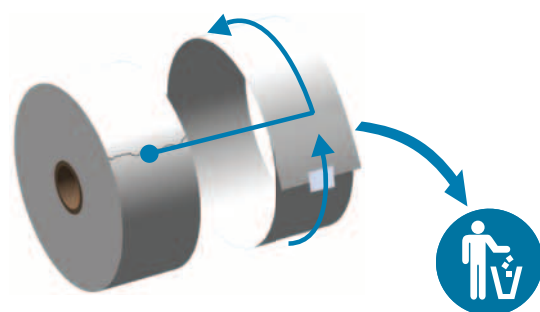
The Zebra Web site or your reseller may be able to help you select the right media for your intended printing application. Find media at: www.zebra.com/supplies

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 Tips

- Store media in a clean, dry, cool, dark area. 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 it is going to be put in 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 (2) 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.

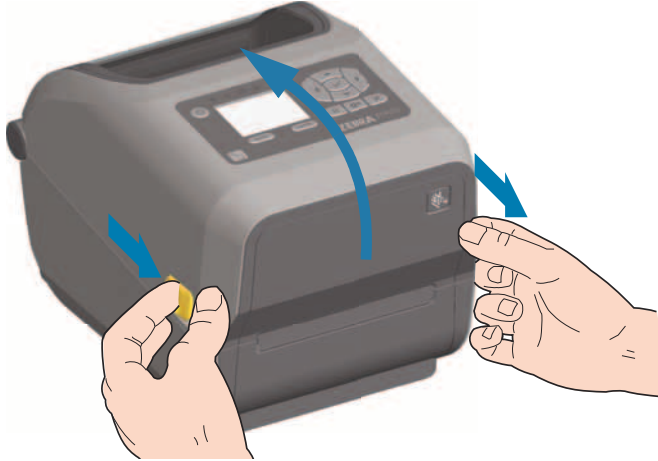
Setting Media Sensing by Media type

- **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**, see one of the following:
 - [Using the Label Dispenser Option](#) after you have loaded media using this procedure.
 - [See Printing on Fan-Fold Media](#).

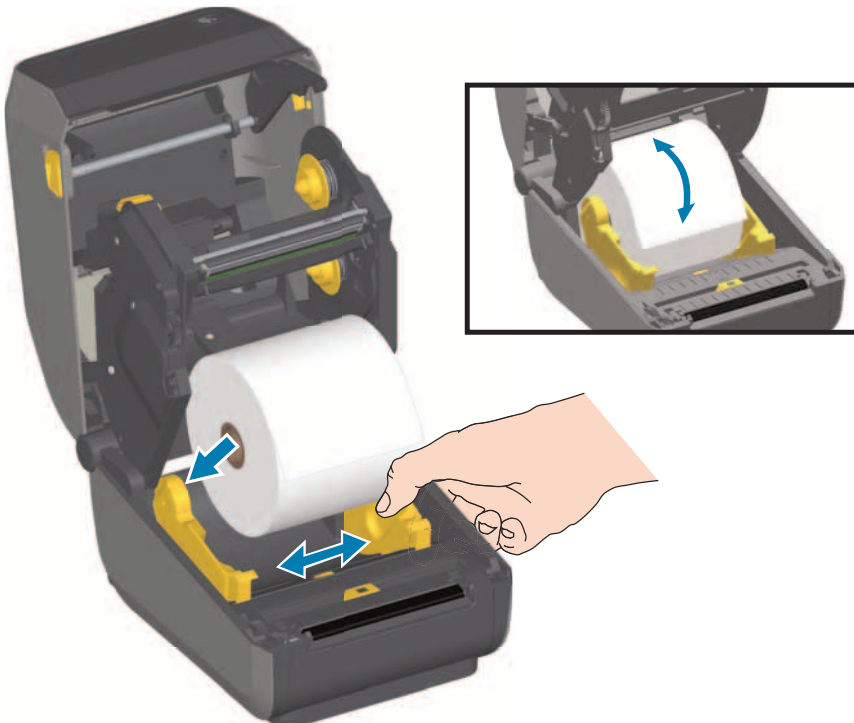
Instructions for media loading:

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

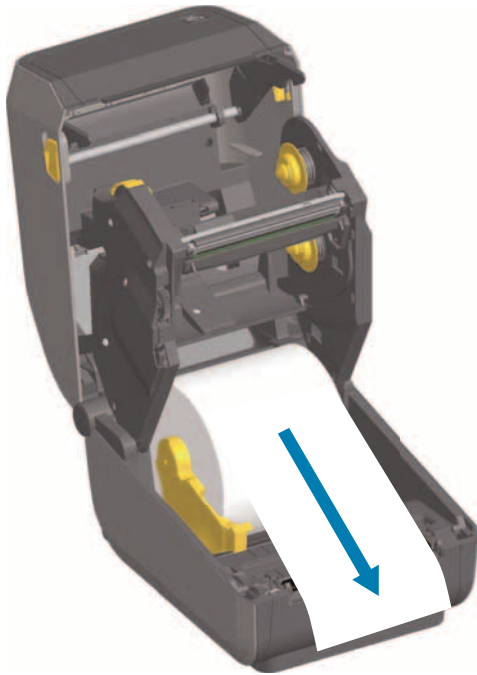
1. Open the printer. Pull the release latch levers toward the front of the printer.



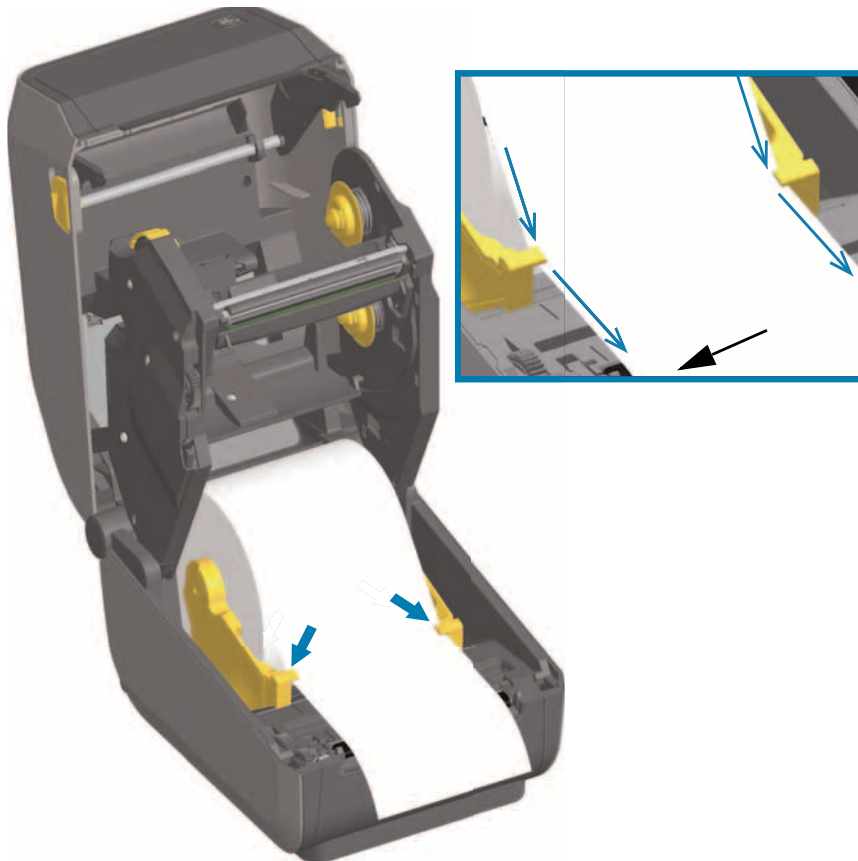
2. Open the media roll holders. Orient the media roll so that its printing surface will face up as it passes over the platen (drive) roller. Pull the media guides open with your free hand and place the media roll on the roll holders and release the guides. Verify the roll turns freely. The roll must not sit in the bottom of the media compartment.



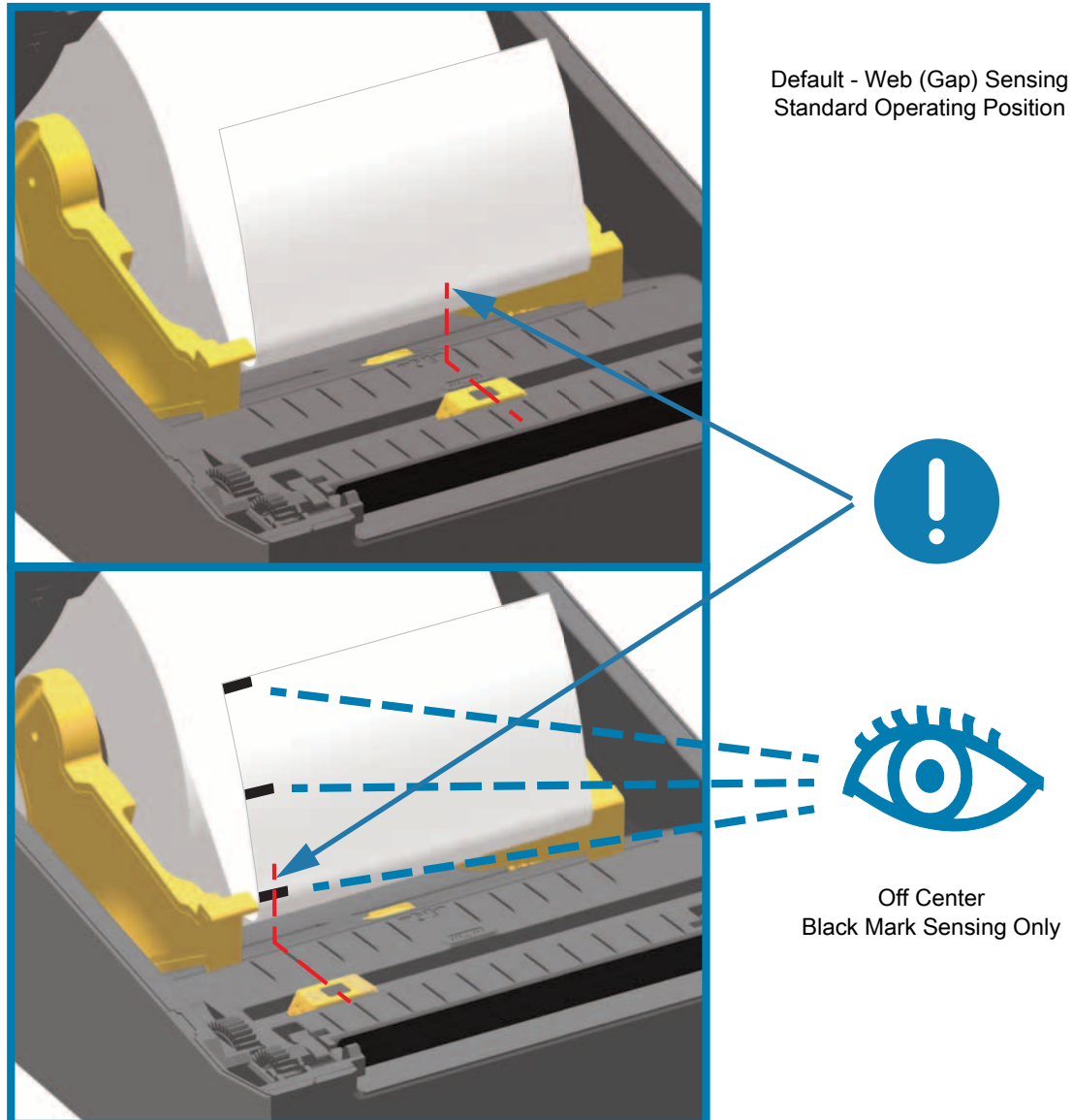
3. Pull the media so that it extends out of the front of the printer.



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



5. Flip the media up and align the movable media sensor for your media type.
 - **For continuous roll receipt type media or 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 so the sensor aligns to the center of the black mark. Avoid the center area of the media to only use black mark sensing for operation with black marks.



Using the 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.

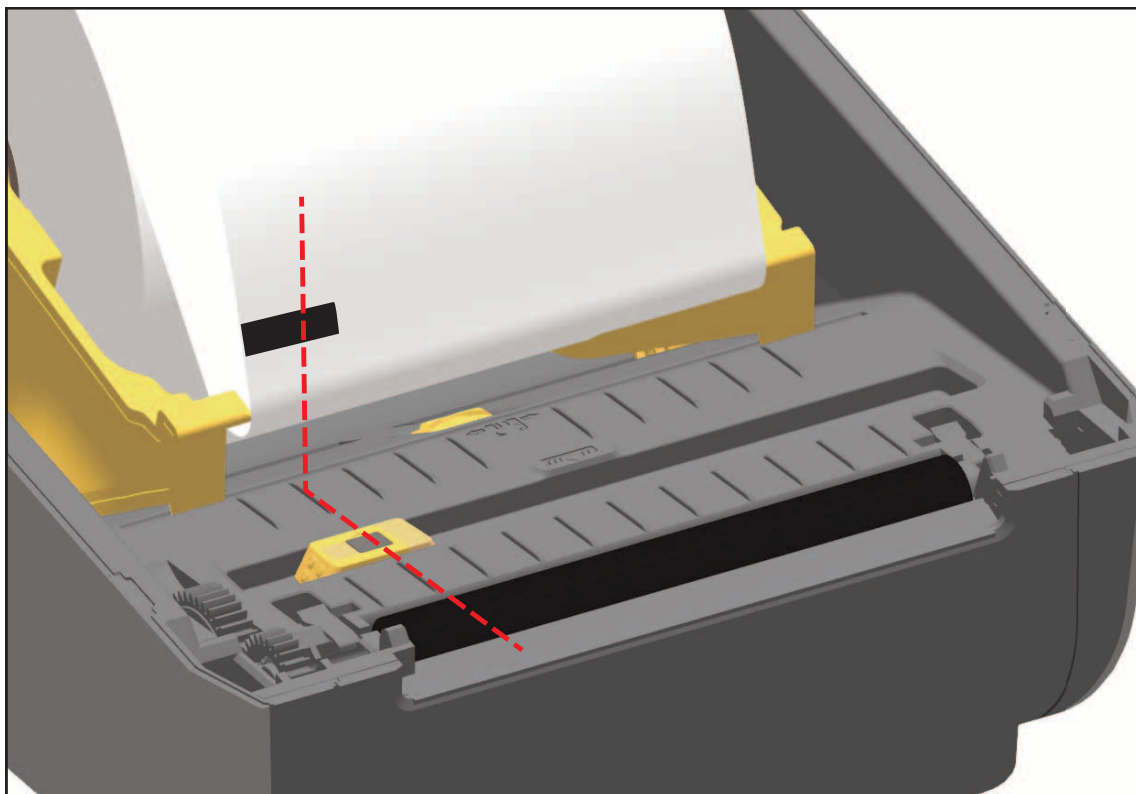
The movable sensor has a center array of sensors. This provides adjustable transmissive web (gap) sensing to positions that match legacy Zebra® desktop printer sensor locations and positions in between. This also provides for use of some atypical media variations or irregularly shaped media.

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

The 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.

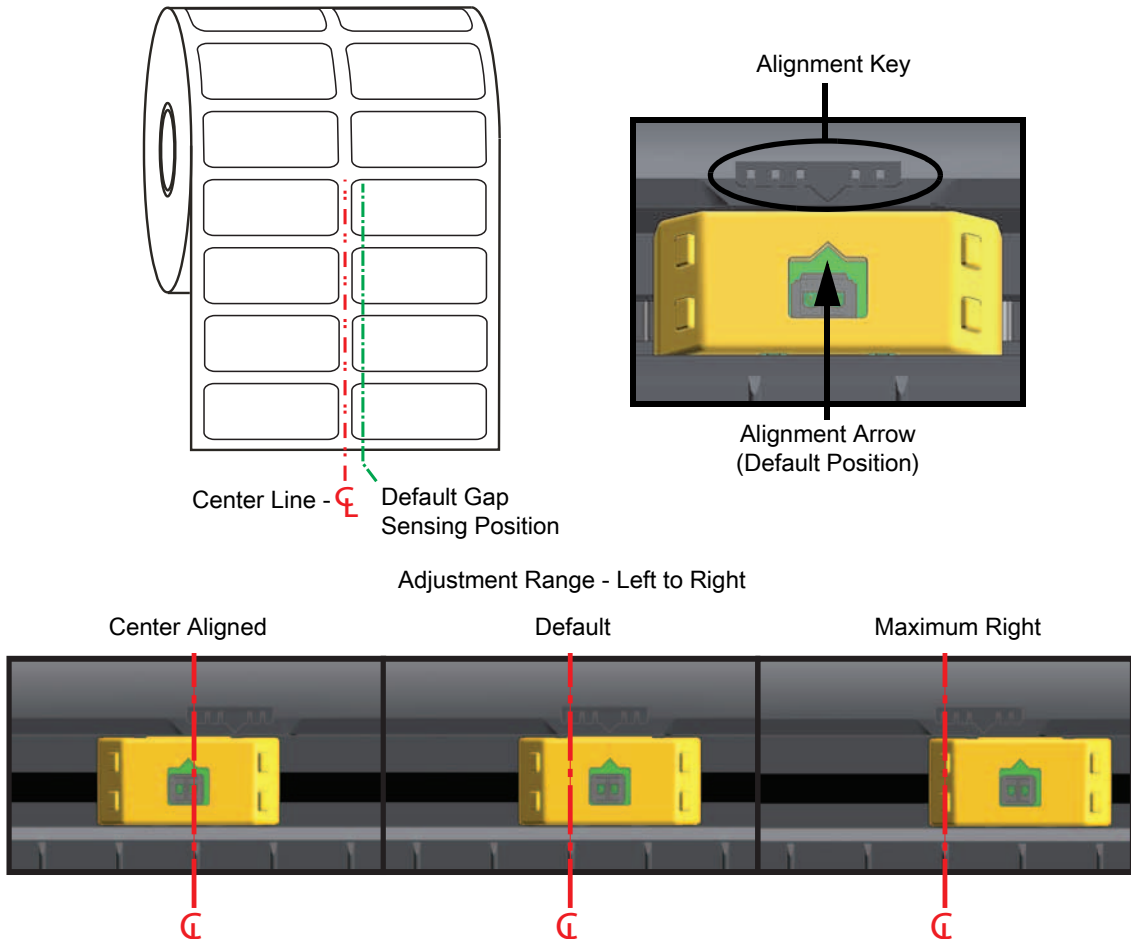
Position the movable sensor's alignment arrow to the middle of the black mark or notch in the underside of the media. Sensor alignment should be set as far as possible from the edge of media but where 100% of the sensor window is covered by the mark. When printing, the media can move from side to side $\pm 1\text{mm}$ (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 most label types.
- The adjustment range is 'from center' to 'off-center' positions which are ideal for printing two (2) 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.

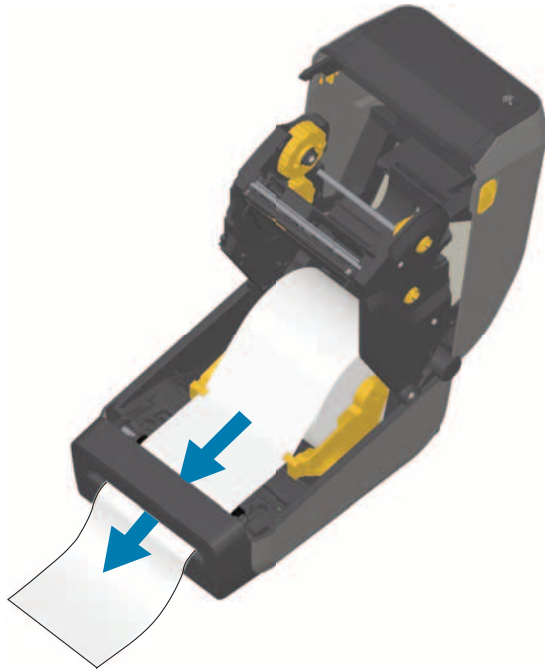


Zebra Printer Models Fixed Sensor Position Relative to a ZD-Series Printer

- **Default** — Zebra Models: G-Series™ fixed position sensors, LP/TLP 2842™, LP/TLP 2844™, LP/TLP 2042™
- **Center Aligned** — Zebra Model: LP/TLP 2742™

Loading Roll Media (continued)

1. **Cutter Models** - For printers with the optional cutter module installed, thread the media through cutter's media slot and pull it out the front of the printer.



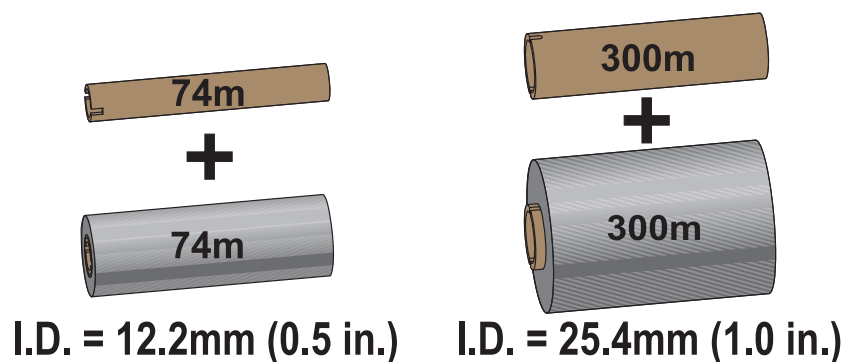
2. Close the printer. Press down until the cover snaps closed.



You may need to calibrate your printer for the media. The printer's sensors need to 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 just press the FEED (Advance) button once to prepare the media for printing.

Loading Thermal Transfer Roll Ribbon

The ZD620 and ZD420 thermal transfer printers have a flexible ribbon system. It supports 300 meter and 74 meter genuine Zebra® ribbons. The printer includes 300 meter ribbon adapters for non-Zebra ribbon rolls. 74 meter ribbon from non-Zebra printers does not need the Non-Zebra ribbon adapters to operate properly.



Transfer ribbons come in several varieties and in some cases colors to match your application needs. Genuine Zebra® transfer ribbons are specifically designed for your printer and Zebra brand media. Using non-Zebra media or ribbons not approved for use in your Zebra® printer may damage your printer or printhead.

- The media and ribbon types should be matched to provide you with optimal print results.
- Always use ribbon that is wider than the media to protect the printhead from wear.
- For direct thermal printing, do not load ribbon in the printer.
- Always use an empty ribbon core that matches your transfer ribbon roll's inner diameter (I.D.). Ribbon wrinkling and other print problems can occur.

Your printer needs to use genuine Zebra® ribbons that have a ribbon out trailer (reflector) to stop printing when roll of transfer ribbon has been used up. Genuine Zebra® ribbons and ribbon cores also include notches used to maintain positive ribbon roll engagement and drive without slipping while printing.

Genuine Zebra® ribbons for this printer include:

- Performance Wax
- Premium Wax/Resin
- Performance Resin for synthetics (6 ips max. speed) and coated paper (4 ips max. speed)
- Premium Resin for synthetics (4 ips max. speed)

For transfer ribbon rolls and other printing supplies, see



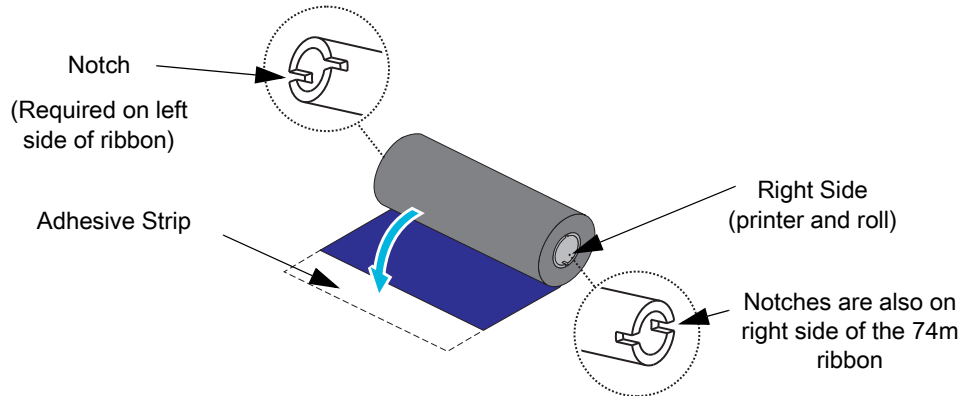
Important • 74 Meter Ribbons - DO NOT USE early model desktop printer ribbon cores! The older style ribbon cores (and some Non-Zebra ribbons) can be identified by notches on only one side of the ribbon core. These older cores are too large.



Important • DO NOT USE ribbon cores with damaged notches - rounded, frayed, smashed, etc. The core notches should be square to lock the core on the spindle or the core may slip causing ribbon wrinkle, poor end of ribbon sensing or other intermittent failures.

Loading Zebra Transfer Roll Ribbon

Before following these steps, 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 above. If they do not, see [Loading Non-Zebra 300 Meter Transfer Ribbon](#).

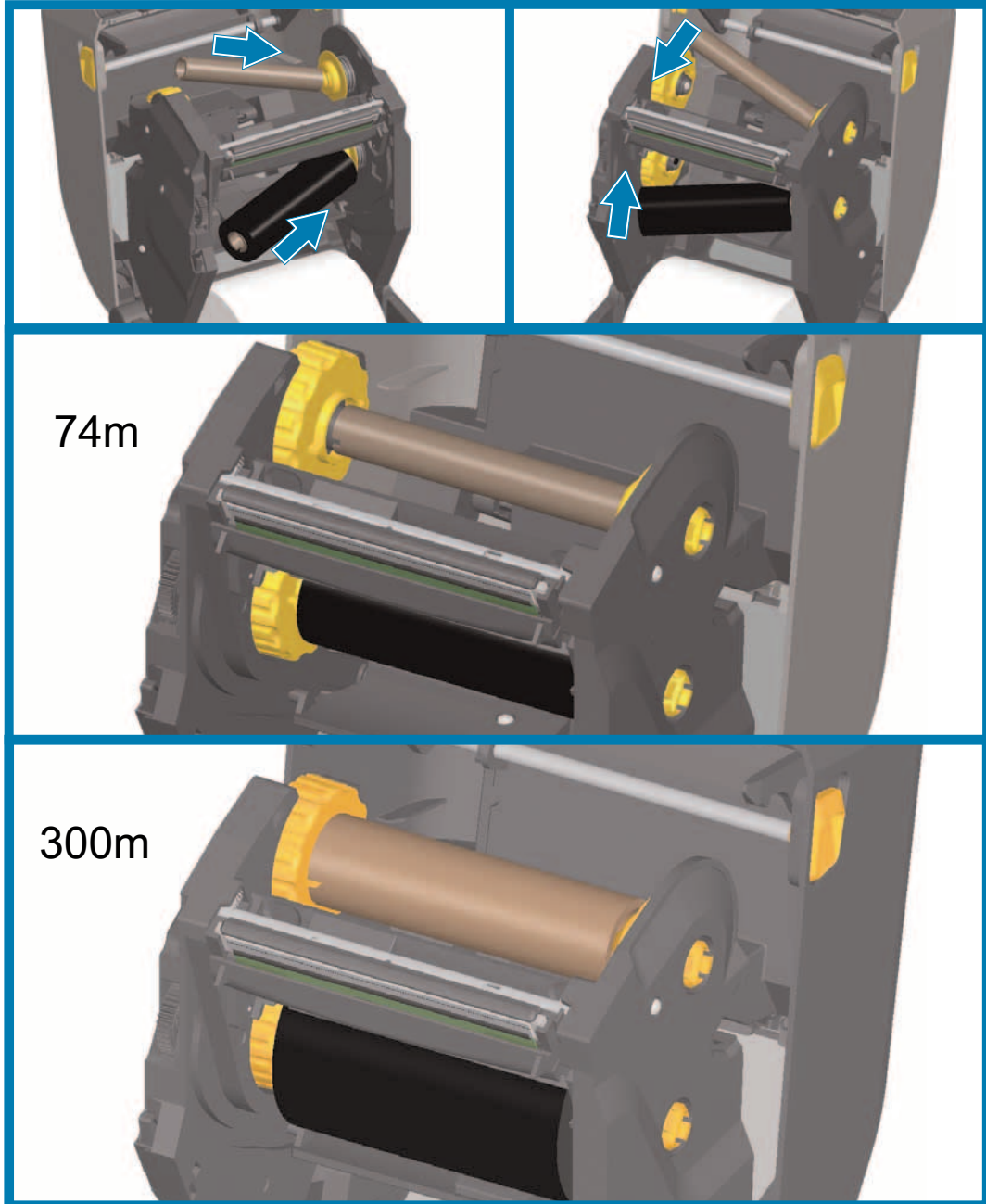
1. With the printer open, place an empty ribbon core on printer's take-up spindles. Push the right side of the empty core onto the spring loaded spindle (right side). Align the core with the center of the left side spindle's hub and rotate the core until the notches align and lock.



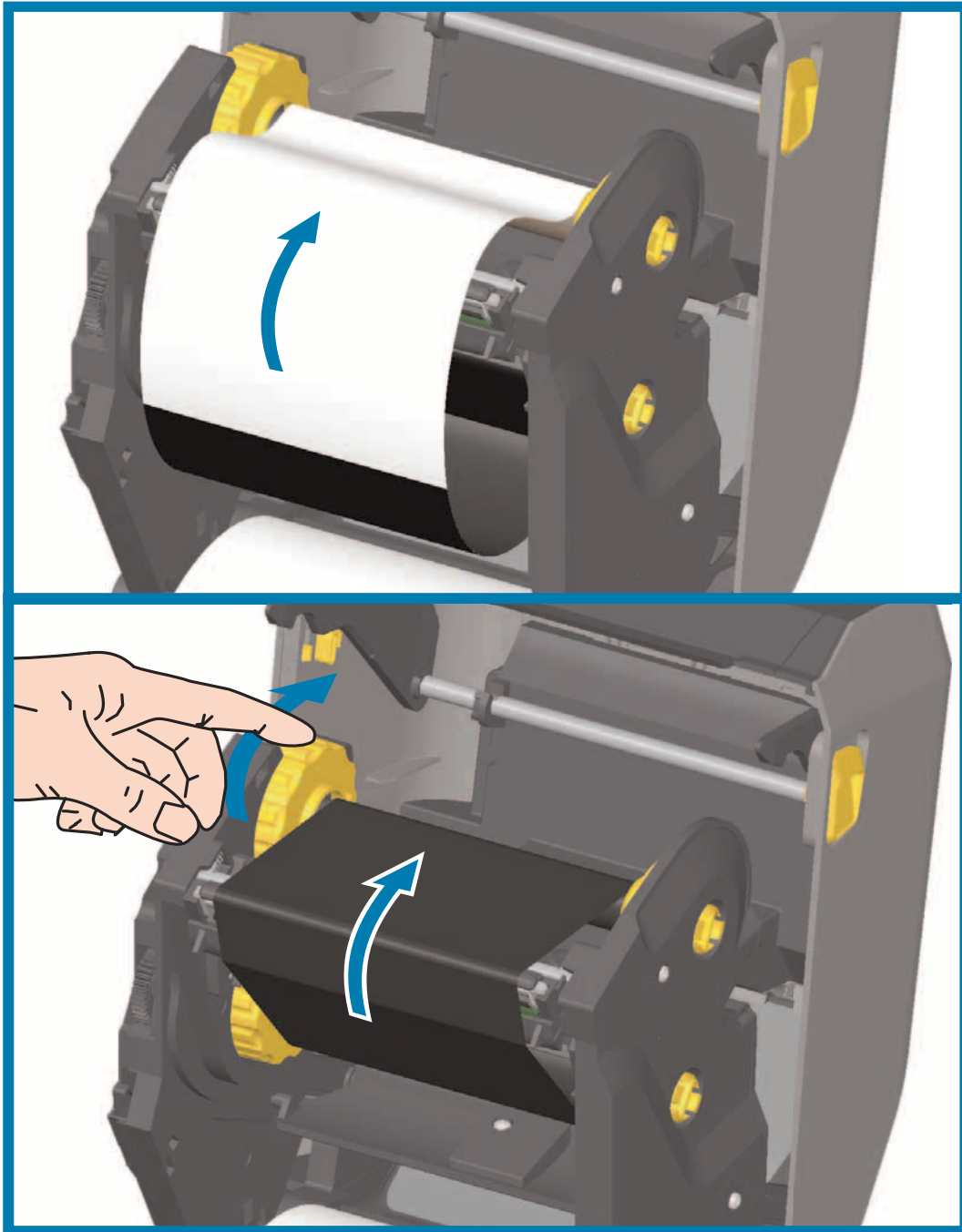
Note • You can find your first ribbon take-up core in the packing box. Subsequently, use the empty supply core from the supply spindle for the next roll of ribbon.

Setup

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 the **FEED** button to have the printer advance a minimum of 20 cm (8 inches) of media to remove slack and ribbon wrinkle (straightens the ribbon), and to align the ribbon on the spindles. Otherwise, wait to turn on the printer and complete the printer instructions in this chapter.

7. Change the print mode setting from direct thermal printing to thermal transfer to set the printer's temperature profiles for thermal transfer media. This can be done with the printer driver, application software, or printer programming commands.
 - When controlling printer operations with ZPL programming, refer to the Media Type (^MT) ZPL II command (follow the instructions in the ZPL Programming Guide).
 - When controlling printer operations with EPL Page Mode, refer to the Options (0) EPL command (follow the instructions in the EPL Page Mode Programmer's Guide).

To verify the mode change from direct thermal printing to thermal transfer printing, use the [Test Printing with the Configuration Report](#) to print a configuration label. The 'PRINT METHOD' should read 'THERMAL-TRANS' on the printer configuration status label.

Loading Non-Zebra 300 Meter Transfer Ribbon

Loading non-Zebra 300 meter transfer ribbon in your printer requires the use of Zebra ribbon core adapters.

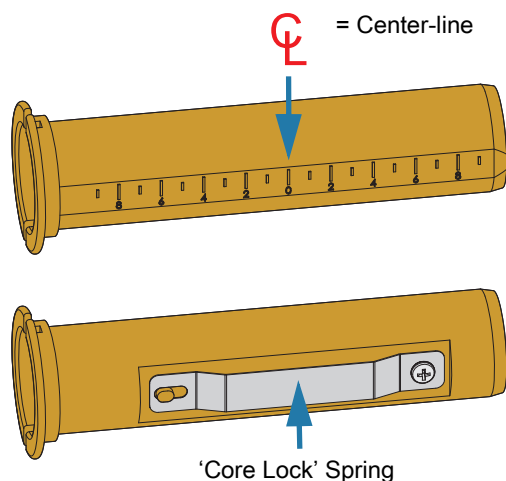
Minimum requirements to use non-Zebra 300 meter ribbons with your printer:

- Inside core diameter (I.D.) of 25.4mm (1.0 inch, range 1.004 to 1.016 inches).
Material: Fiberboard; hard materials such as plastic cores may not function correctly.
- Ribbon width range of 110 to 33mm (4.3 to 1.3 inches).
- The maximum outer diameter of the ribbon is 66mm (2.6 inches).



Caution • 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 (too soft or hard), and fit (loose or tight ribbon core or exceeds maximum outer diameter - 66mm).

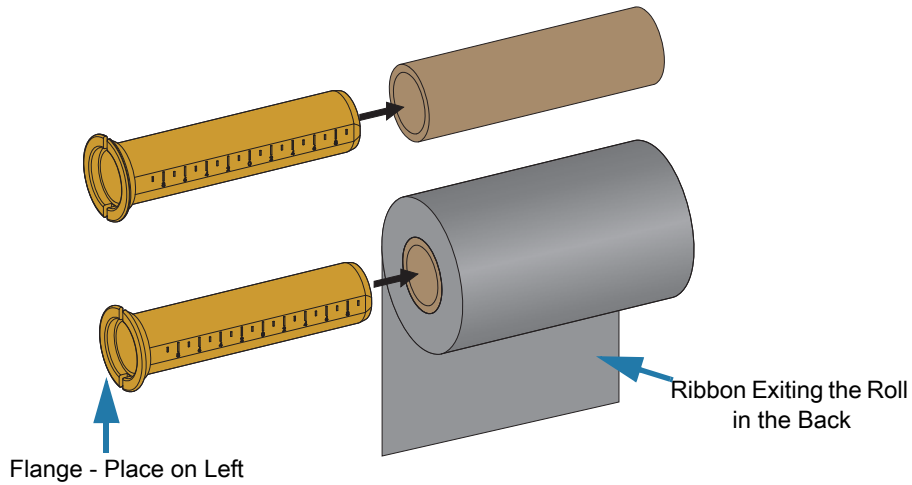
The adapters help you align the ribbon and core to the media (and printer's) center. The adapters include a 'core lock' spring to engage the soft fiberboard inside of the ribbon core and scale measured from the printer's center-line when mounted in the printer.



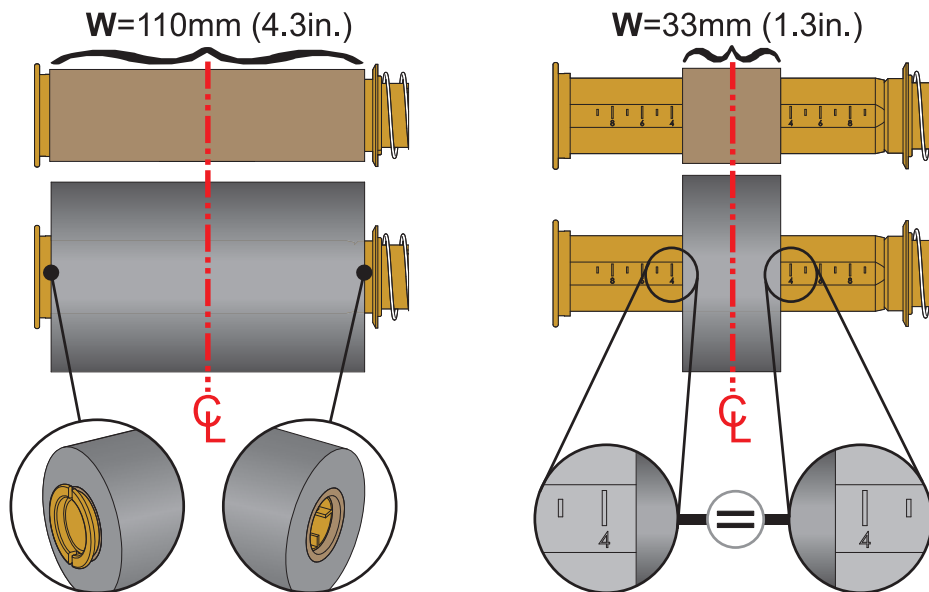
1. Load an empty ribbon core onto a ribbon core adapter. The empty ribbon core should be the same width (or larger) than the ribbon roll. Roughly center the core over the adapters center line. An empty Zebra ribbon core may be used instead of the adapter and empty non-Zebra ribbon core. One 300m empty ribbon core is supplied with the printer.

Setup

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 in the illustration. Roughly center the core over the adapters center line.

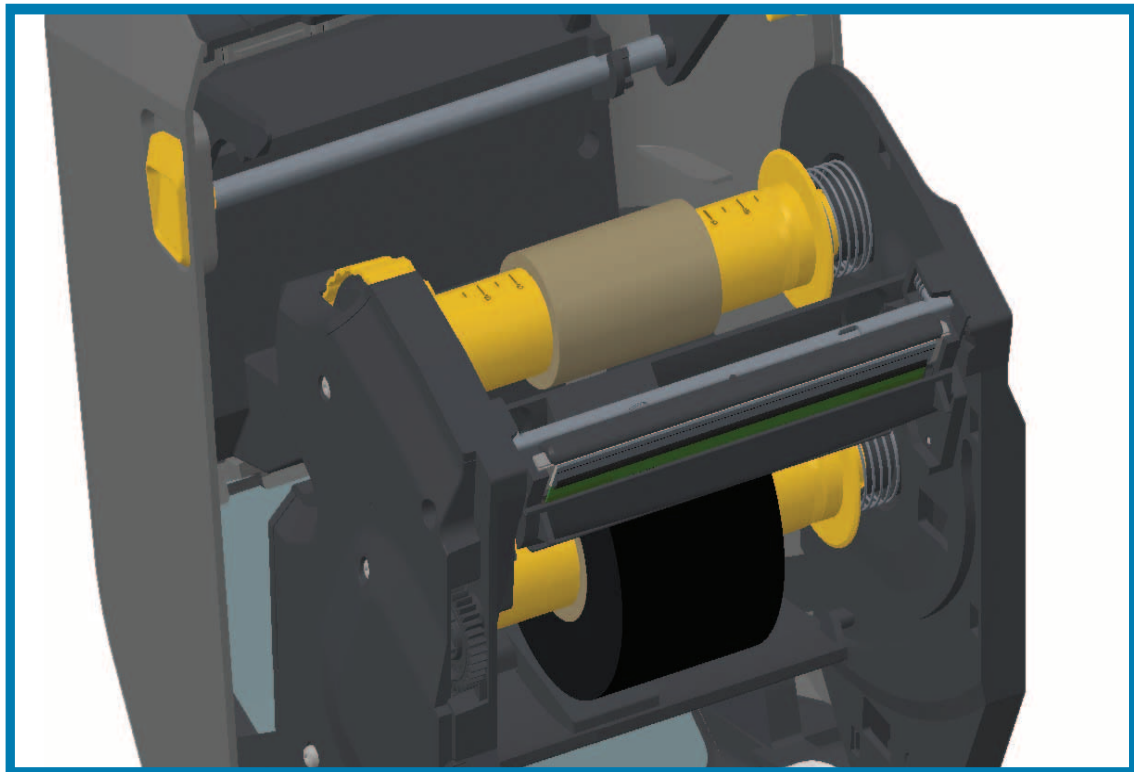
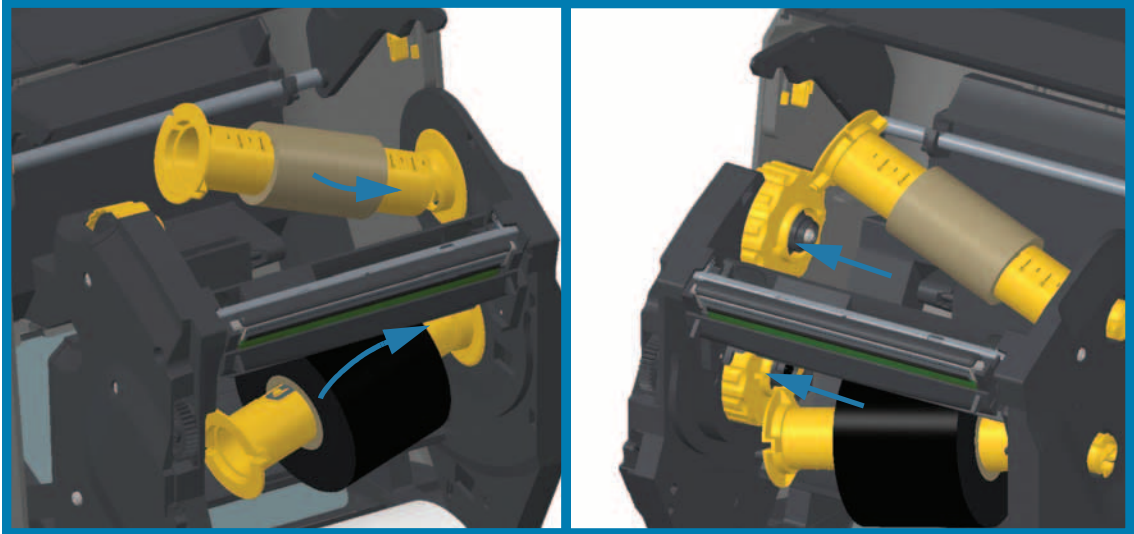


Note • The maximum roll width of 110 mm (4.3 inches) does not require centering. For media less than maximum width down to the minimum width of 33mm (1.3 inches), use the graduated scale on the adapter core to align the ribbon rolls to the media and printer.



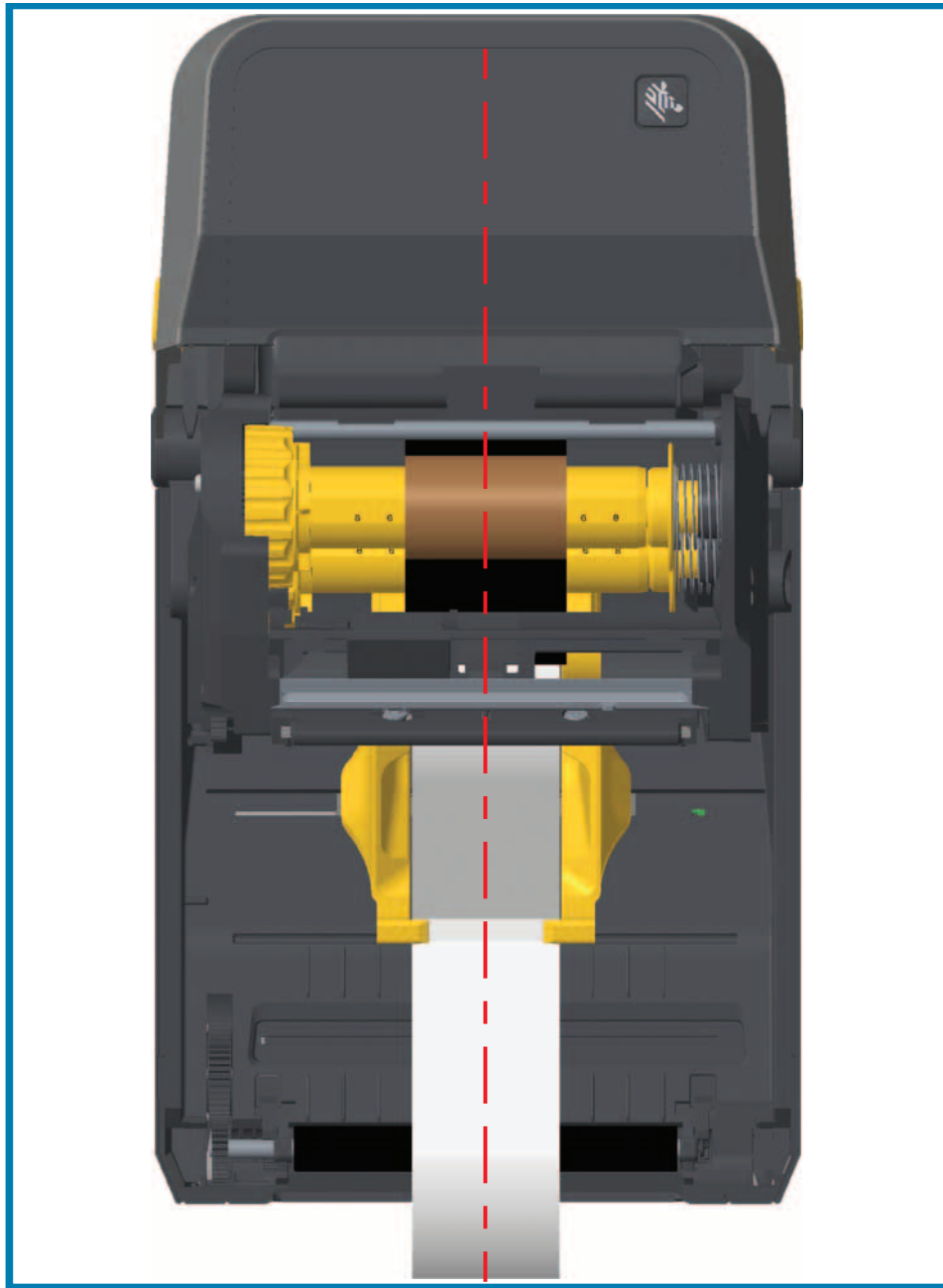
Setup

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



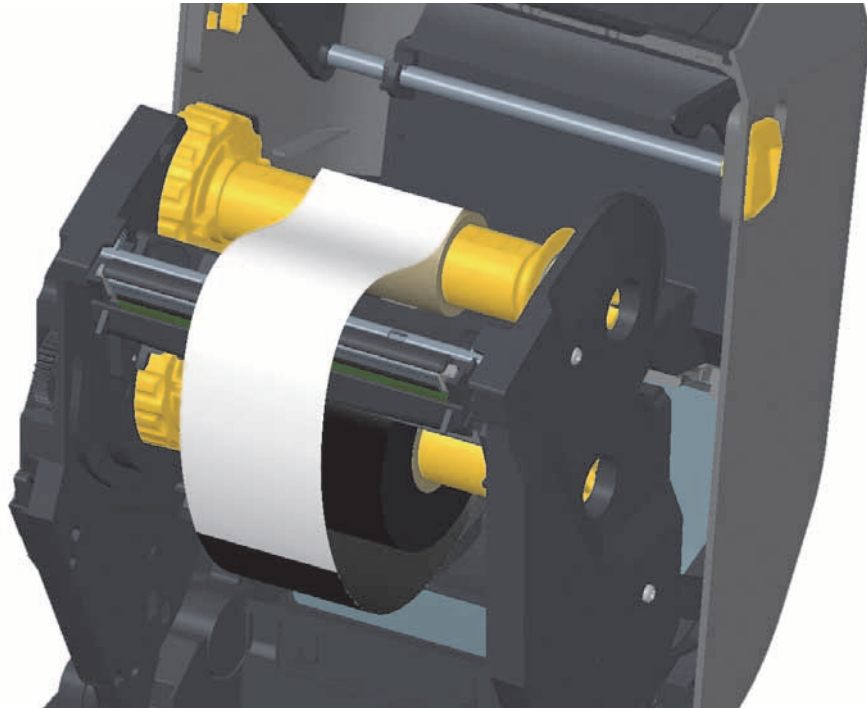
Setup

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.). Remember that you can use the center line scales on the ribbon core adapter to place their positions.
 - If you have forgotten to check if the ribbon is wide enough for the media in use, now is the time to check. The ribbon must be wider than the media (including the label liner or backing) to protect the printhead.

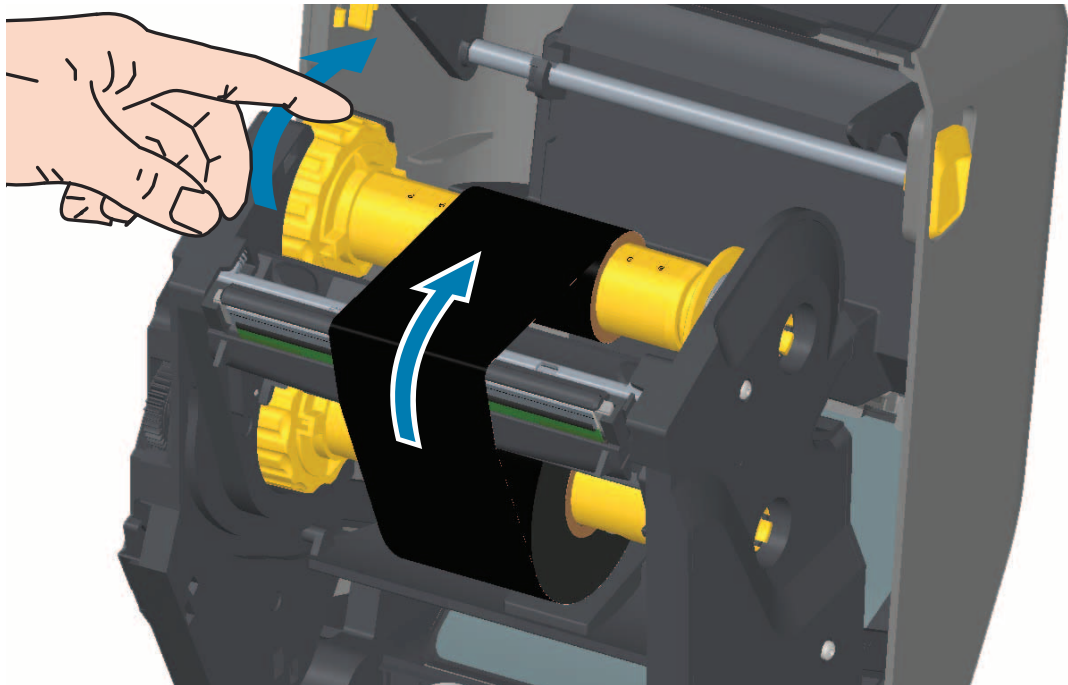


Setup

5. Attach the ribbon to the take up core. Use thin strip of tape to secure the ribbon to the take-up core, if your media does not have an adhesive strip on the ribbon leader like genuine Zebra® ribbon. Align the ribbon so that it will be taken straight onto the core.



6. 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 with the supply ribbon roll. The ribbon should be wound, at minimum, one and a half times around the take-up ribbon core.

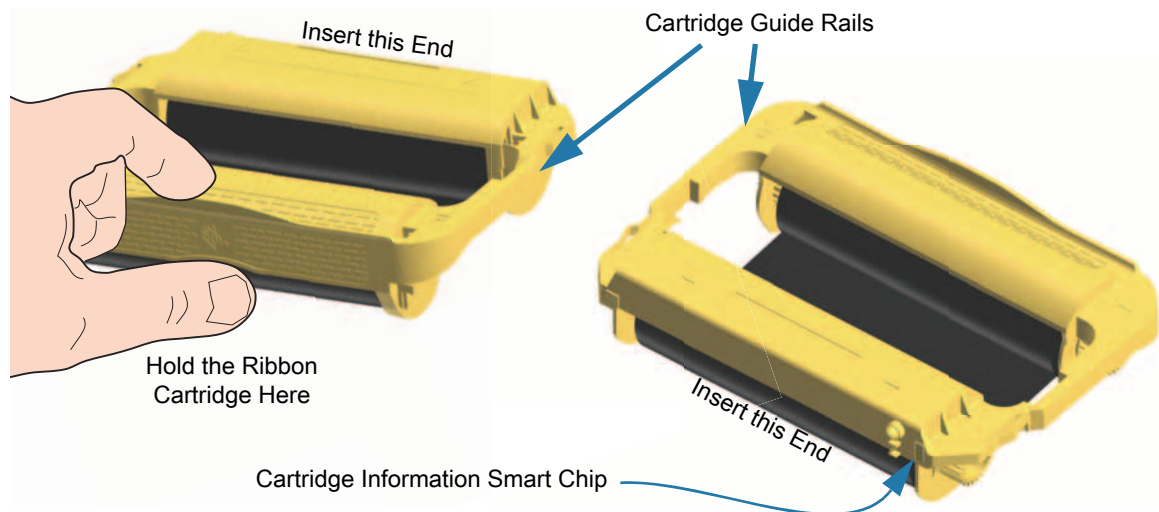


7. Verify that the media is loaded and ready to print and then close the printer cover.
8. If printer power is on, press the FEED button to have the printer advance a minimum of 20 cm (8 inches) of media to remove slack and ribbon wrinkle (straightens the ribbon), and to align the ribbon on the spindles. Otherwise, wait to turn on the printer and complete the printer 'Getting Started' instructions in this chapter.
9. Change the print mode setting from direct thermal printing to thermal transfer to set the printer's temperature profiles for thermal transfer media. This can be done with the printer driver, application software, or printer programming commands.
 - When controlling printer operations with ZPL programming, refer to the **Media Type (^MT)** ZPL II command (follow the instructions in the ZPL Programming Guide).
 - When controlling printer operations with EPL Page Mode, refer to the **Options (0)** EPL command (follow the instructions in the EPL Page Mode Programmer's Guide).
10. To verify the mode change from direct thermal printing to thermal transfer printing, use the [Test Printing with the Configuration Report](#) to print a configuration label. The 'PRINT METHOD' should read 'THERMAL-TRANS' on the printer configuration status label.

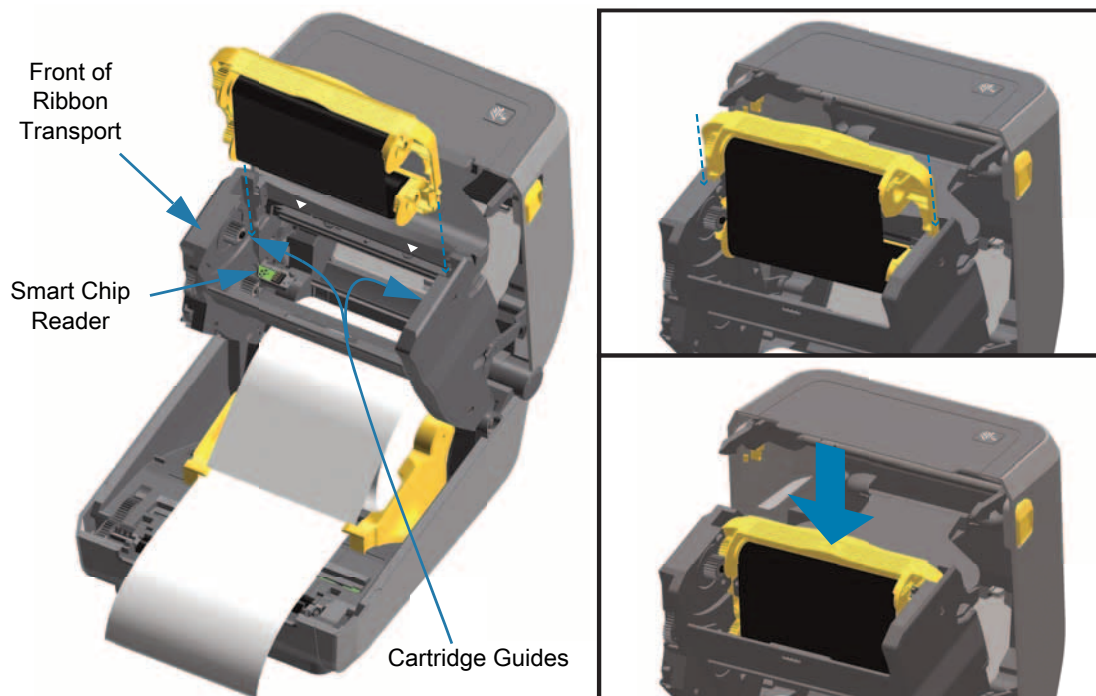
Your printer is now ready to print.

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.



1. Insert the ribbon cartridge into the ribbon cartridge slot on the ribbon transport in your open printer. Push until the cartridge is nearly flush to the front of the ribbon transport. You will hear and feel the cartridge lock into place. Only Genuine Zebra Ribbon Cartridges are supported.



Run a SmartCal Media Calibration

The printer needs to set the media parameters for prior to printing optimal operation. The printer will automatically determine media type (web/gap, black mark/notch, or continuous) and measure media characteristics.

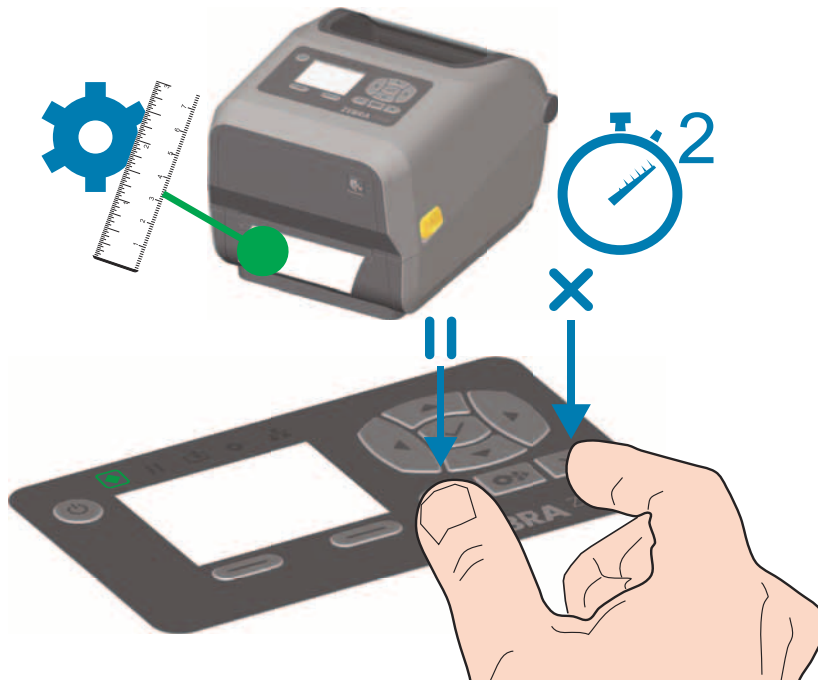


Important • After the initial calibration to a specific media is completed, it is not required to perform additional calibrations each time the media is replaced. The printer automatically measures the media to adjust for small changes in the media characteristics while printing.

Pressing the FEED (Advance) once or twice after a new roll of media (same batch) has been installed will synchronize the labels. It is then ready to continue printing.

SmartCal Procedure

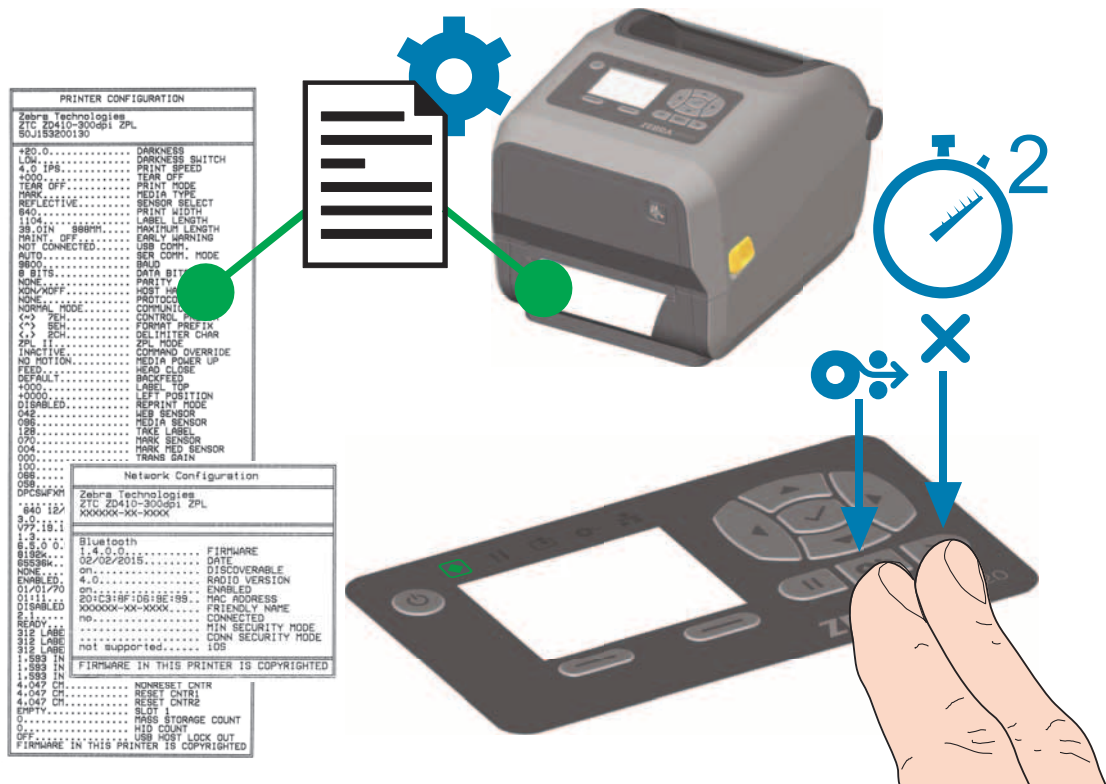
1. Make sure the media and ribbon cartridge (if you are thermal transfer printing) are loaded properly in the printer and the top cover of the printer is closed.
2. Press the POWER button to turn the printer on.
3. Once the printer is in the ready state (Status indicator is solid green), press and hold the PAUSE and CANCEL button for two (2) seconds and release.
4. The printer will measure a few labels and adjust media sensing levels.
5. When the printer stops, the Status indicator will turn solid green.



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 on the Configuration reports printout that may be helpful with printer installation and with troubleshooting your printer.

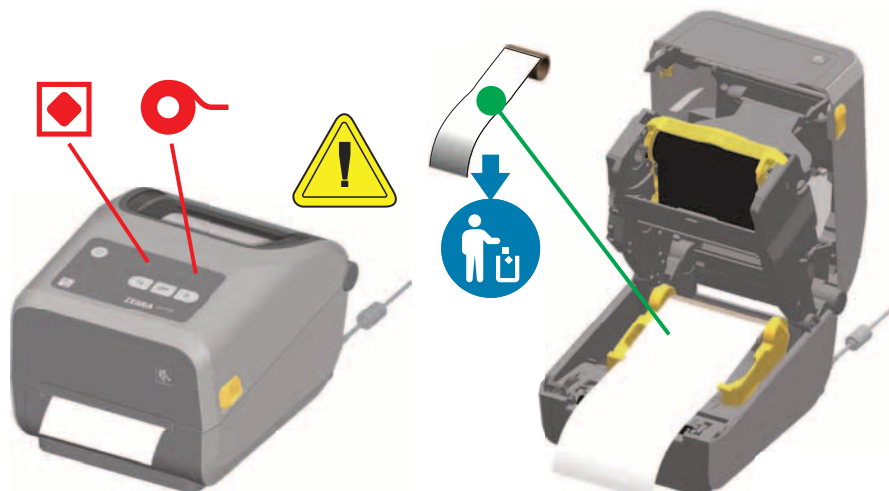
1. Make sure the media and ribbon cartridge (if you are thermal transfer printing) are loaded properly in the printer and the top cover of the printer is closed.
2. Turn the printer ON.
3. Once the printer is in the ready state (Status indicator is solid green), press and hold the **FEED** and **CANCEL** buttons for two (2) seconds and release.
4. The Printer and Network Configuration Reports (shown below) will be printed.
5. When the printer stops, the Status indicator will turn solid green.



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

Detecting a Media Out Condition

When you run out of media, your printer will report a 'Media Out' condition with the Status and Media indicators both light solid red. This is part of the normal media usage cycle.



Recovering from a Media Out condition

1. Open the printer.
2. Observe that the media is at the end or nearly at the end of the roll with a label missing from the liner.
3. Remove the remaining media and roll core.
4. Insert a new roll of media. See [Loading Roll Media](#).
 - If you are installing more of the same media, just load the new media and press the FEED (Advance) button once to resume printing.
 - If you are loading different media (size, vendor, or even batch is different), then reloading media followed by a SmartCal is needed to ensure optimal operation.
 - 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.

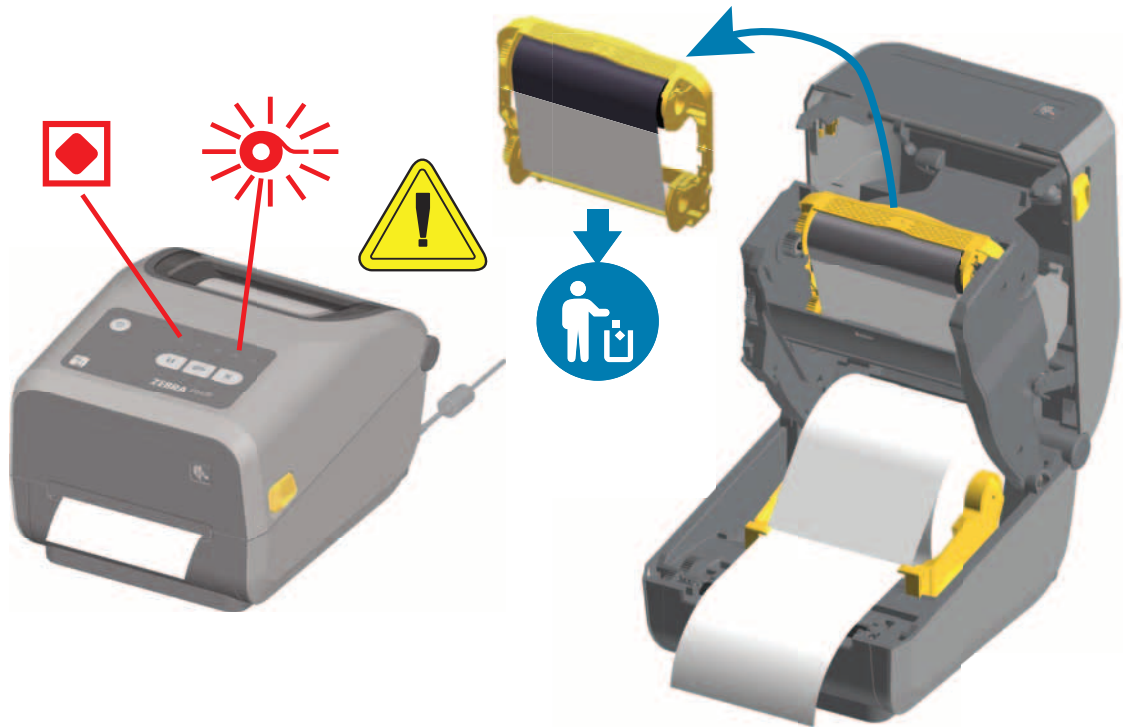


Important • Sometimes a label may be missing some where in the middle of your roll of labels (not at the end of media). This will also cause a 'Media Out' condition. To recover, just pull the media past the missing label until the next label is over the platen roller. Close the printer. Press the FEED (Advance) button once. The printer will resynchronize the label position and will be ready to resume printing.

Detecting a Ribbon Out Condition

When you run out of printable ribbon, your printer will report a 'Ribbon Out' condition with the Status and Media indicators. This is part of the normal media usage cycle.

When the printer detects that the ribbon is out, the Status indicator will turn solid red and the Media indicator will be flashing red.



Recovering from a Ribbon Out condition

1. Open the printer.
2. Observe a reflective ribbon (used to detect end of ribbon) is exposed on the underside of the ribbon cartridge or ribbon roll. The front ribbon roll is also full.
3. Remove the used ribbon cartridge and dispose of it properly.
4. Load new ribbon rolls or Insert a new ribbon cartridge. See [Loading Thermal Transfer Roll Ribbon](#) or [Loading the ZD420 Ribbon Cartridge](#).
5. Press the FEED (Advance) button once to resume printing.

Connecting your Printer to a Computer

The printer supports a variety of interface options and configurations. These include:

- Universal Serial Bus (USB 2.0) interface - Standard.
- RS232 Serial - ZD620 standard. Field Upgrade Option for ZD420 printers.
- Ethernet (LAN) - ZD620 standard. Field Upgrade Option for ZD420 printers.
- Internal Wi-Fi (802.11ac) and Bluetooth Classic 4.1 (3.0 Compatible) - Factory Installed Option.
 - WiFi models include Bluetooth Low Energy (low speed connection) for printer configuration using software running on an Android or iOS device.

Pre-install Windows® Printer Drivers

Install the Zebra Setup Utilities (ZSU) before applying power to the printer connected to the PC. The utility installs the Zebra Windows drivers first. The ZSU installation wizard will then prompt you turn on the printer. Follow the instructions to complete your printer installation.

The Zebra Setup Utility is designed to assist you with installing your printer. The cabling and unique parameters for each of these physical printer communication interfaces is discussed in the following pages to assist you with making configuration setup choices prior to and immediately following applying power. The Zebra Setup Utilities configuration wizards will instruct you to turn the printer's power on at the appropriate time to complete the installation of your printer.

For more details on configuring network (Ethernet or Wi-Fi) and Bluetooth communication, see the following guides:

- Wired and Wireless Print Server User Guide
- Bluetooth Wireless Guide

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 foot] recommended).
- Do not tightly bundle the data cables with power cords.
- Do not tie the data cables to power wire conduits.

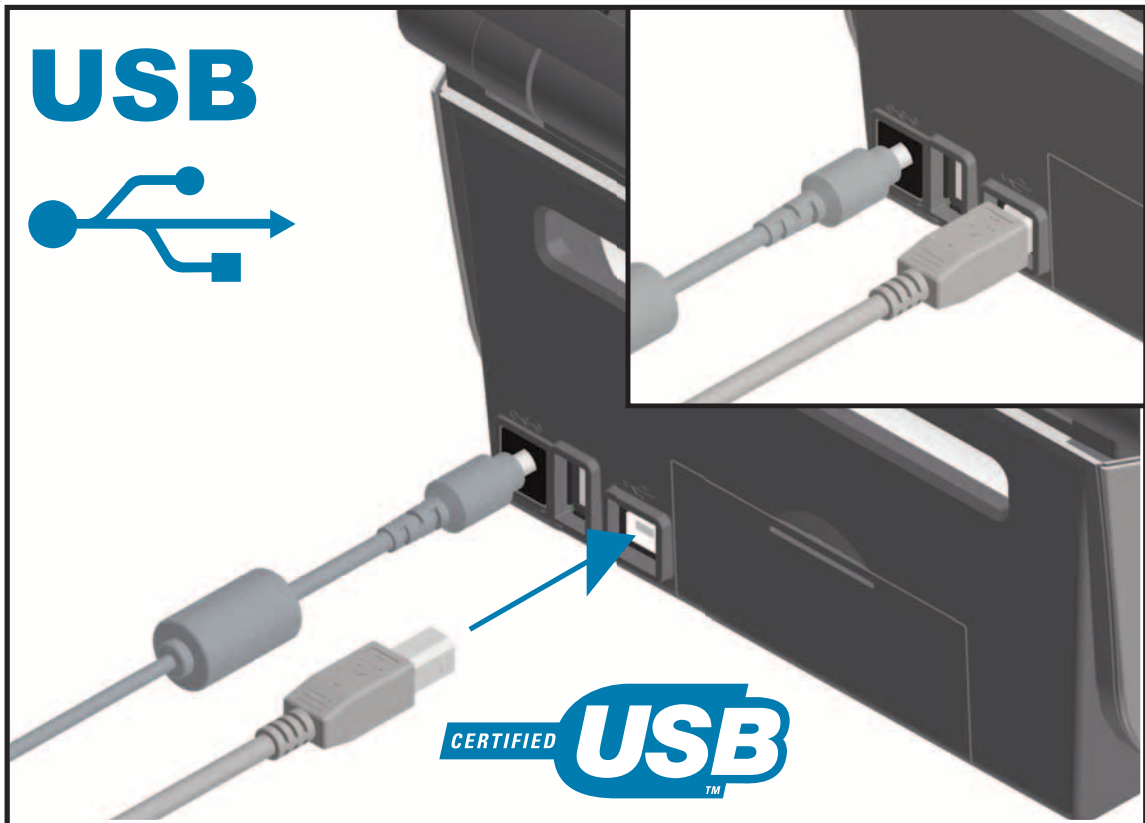


Important • This printer complies with FCC “Rules and Regulations,” Part 15, for Class B Equipment, using fully shielded data cables. Use of un-shielded cables may increase radiated emissions above the Class B limits.

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 makes installation easy. 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

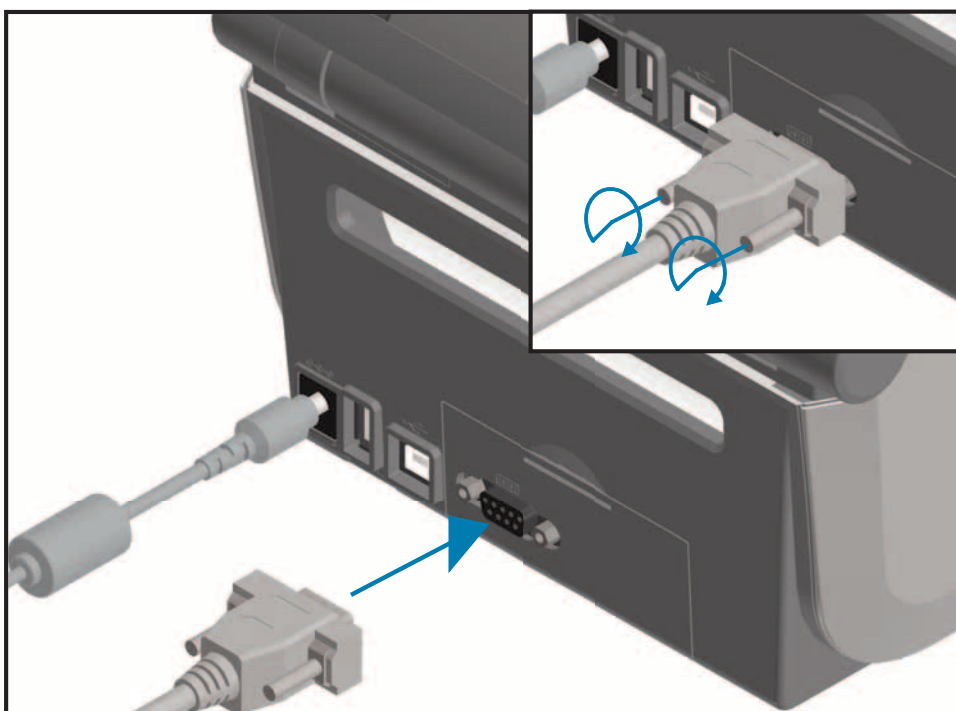
The printer uses a Null Modem (cross-over) cable for DTE communications. The required cable must have a nine-pin "D" type (DB-9P) male connector on one end which plugs into the mating (DB-9S) serial port located on the back of the printer. The other end of this signal interface cable connects to a serial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

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 programming ^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, and XON/XOFF ('Software' data flow control in the Windows based host system).

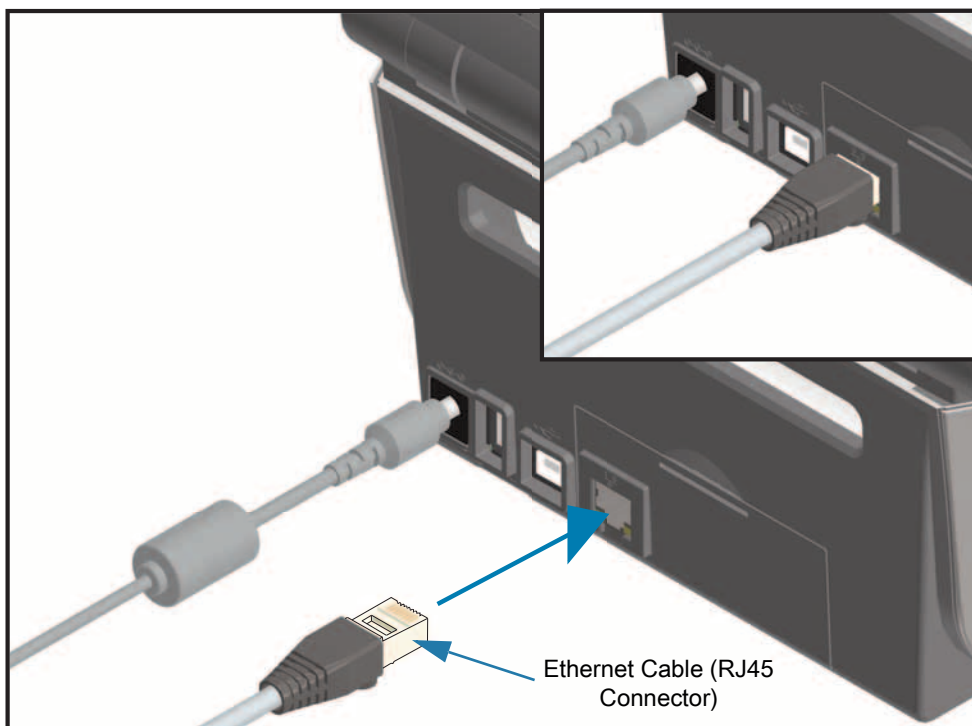


Important • Do not use RS-232 cable adapter dongles (DTE<=>DCE) with this printer. Some dongles can interfere with the operation of USB Host port devices at printer power up.

Ethernet (LAN, RJ-45)

The printer requires UTP RJ45 Ethernet cable rated CAT-5 or better.

The printer has a built-in network print server. For more information on configuring your printer to run on a compatible Ethernet based network, see the [Wired and Wireless Print Server users guide](#). The printer must be configured to run on your network. The print server on board your printer can be accessed through the printer's print server Web pages.



Ethernet Status/Activity Indicators

The Ethernet connector on the printer has two (2) status/activity indicators that are partially visible to provide interface status at the connector. The printer also has the user interface indicator lights for printer network operation status, see the [Meaning of the Indicator Light Patterns](#) for more 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) require a network IP (Internet Protocol) address. The printer's IP address is needed to access the printer for printing and printer configuration. The five different ways to assign an IP address are:

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

DHCP for Personal Networks

The printer by default is set to operate on an Ethernet LAN or Wi-Fi network with DHCP. This setting is intended primarily for personal networks. The network automatically provides a new network IP address each time the printer is turned on. The Windows printer driver uses a Static IP address to connect to the printer. The IP address set in the printer driver will need to be changed to access the printer if its assigned IP address has changed after the printer's initial installation.

Managed Networks

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

Print Server - Default User ID and Password

There are some features that require the default User ID and/or default password to access the printer's print server or if you have the Wi-Fi option in the printer. The Factory Default Values are shown below:

- **User ID:** [admin](#)
- **Password:** [1234](#)

Wi-Fi and Bluetooth Classic Wireless Connectivity Option

This guide covers basic configuration of your Internal Wi-Fi Print Server and Bluetooth Classic 4.X wireless connectivity option. This manual only covers installing the Wi-Fi as part of the Wi-Fi and Bluetooth Classic wireless connectivity option in the [Setting Up the Wi-Fi Print Server Option](#). See the Zebra Web site for **Wired and Wireless Print Server User Guide** for more information on the printer's Ethernet operation.

This manual only covers installing the Bluetooth as part of the Wi-Fi and Bluetooth Classic wireless connectivity option in the [Bluetooth Option Configuration](#). See the Zebra Web site for **Bluetooth Wireless Guide** for more information on the printer's Bluetooth operation.

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](#). See the [About](#) section of this guide to find direct links to printer support pages for your specific Link-OS printer model and Firmware updates.

Setup for Windows[®] OS

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

Windows to Printer Communication Setup (Overview)

For supported Windows Operating systems (most common) with a Local (wired) connection:

1. **Download the Zebra Setup Utilities** from the Zebra web site.
 - 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
2. **'Run' the Zebra Setup Utilities** from your Download directory.
3. **Click on 'Install New Printer'** and run the install wizard.
4. Select 'Install Printer'.and select your printer's model number from the list of ZDesigner printers.
5. Select the port (USB or Serial) that you connected to the PC. Use these interfaces to assist Wizard guided installation of networked or Bluetooth Classic (4.0).
6. Turn the printer ON and configure printer communications for your interface type.
7. Use the Windows driver to print a 'Test Print' to verify operation with Windows.

Pre-install Windows® Printer Drivers

Install the **Zebra Setup Utilities (ZSU)** before applying power to the printer connected to the PC (running a Zebra driver supported Windows operating system). The utility installs the Zebra Windows drivers first. The ZSU installation wizard will then prompt you to apply the printer power. Continue to follow the instructions to complete your printer installation.

The Zebra Setup Utility is designed to assist you setting up printer communication on a PC running the Windows operating system. The cabling and unique parameters for each of these physical printer communication interfaces is discussed in the following pages to assist you with making configuration setup choices prior to and immediately following applying power. The Zebra Setup Utilities configuration wizards will instruct you to turn the printer's power on at the appropriate time to complete the installation of your printer.

For more details on installing Ethernet (network) and Bluetooth interfaces:

- Wired and Wireless Print Servers User Guide
- Bluetooth Wireless Guide

Setting Up the Wi-Fi Print Server Option

This section covers basic configuration of your internal Wi-Fi Print Server option. For more detailed information, refer to the **Wired and Wireless Print Servers User Guide**.



Note • The wireless radio option, which includes Wi-Fi, Bluetooth classic and Bluetooth low energy, is only available as a factory installed configuration.

You may configure your printer for wireless operation in the following ways. This basic guide covers only the first option, the **Connectivity Wizard**.

- **Through the Connectivity Wizard**, which writes a ZPL script for you. On the last screen of the utility, you may choose to send the command directly to your printer, or you may choose to save the ZPL script to a file. The saved ZPL file has several purposes:
 - The file can be sent to the printer through any available connection (serial, parallel, USB, or wired print server).
 - The file can be resent to the printer after the network settings have been restored to factory defaults.
 - The file can be sent to multiple printers that will use the same network settings.
- **Through ZPL script that you write yourself.** Use the ^wX command to set the basic parameters for security type. You can send the command through any available connection (serial, parallel, USB, or wired print server). Refer to the ZPL Programming Guide for more information on this option.
- **Through Set/Get/Do (SGD) commands** that you send to the printer. Begin with wlan.security to set the wireless security type. Depending on which security type that you select, other SGD commands will be necessary to specify other parameters. You can send the commands through any available connection (serial, parallel, USB, or wired print server). Refer to the ZPL Programming Guide for more information on this option.

Configure Using the ZebraNet Bridge's Connectivity Wizard



Note • The preferred tool for connecting and configuring Link-OS printers to cloud, WLAN, and LAN; is now Link-OS Profile Manager. You can get Profile Manager and ZebraNet Bridge Enterprise (local and LAN configurations) utility is available through <http://www.zebra.com/software>. ZebraNet Bridge Enterprise version 1.2.5 or later is required to configure the printer correctly for use.

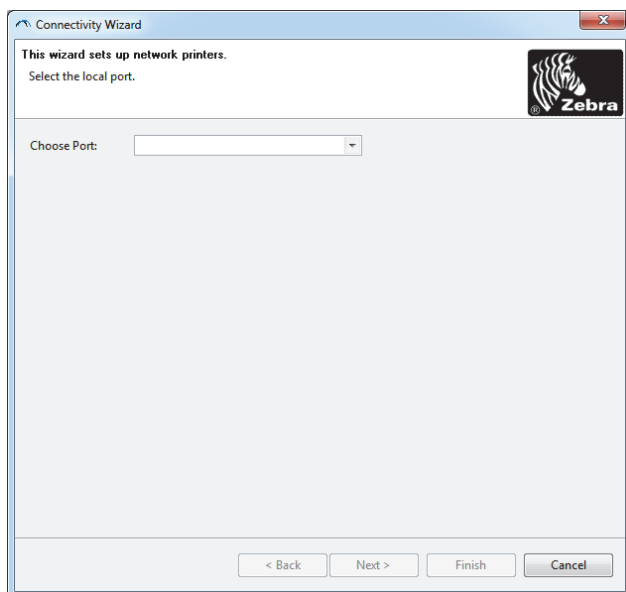
The Connectivity Wizard, which is part of this software, allows you to configure your printer easily for wireless operation by writing the appropriate ZPL script for you. Use this utility when you are first installing the wireless print server or after you set the network options back to factory defaults.



Note • You can only set up one print server at a time with the Connectivity Wizard. To configure multiple print servers (wired and wireless), run the program once for each print server.

To use the Connectivity Wizard, complete these steps:

1. If it is not already installed, install ZebraNet Bridge Enterprise on your computer.
You can get the program from the Zebra Web site at <http://www.zebra.com/software>.
2. Launch the ZebraNet Bridge Enterprise program.
If you are prompted for a serial number, you may click Cancel. You will still be able to use the Connectivity Wizard.
3. From the Menu bar, select Tools > Connectivity Wizard. The Connectivity Wizard opens.



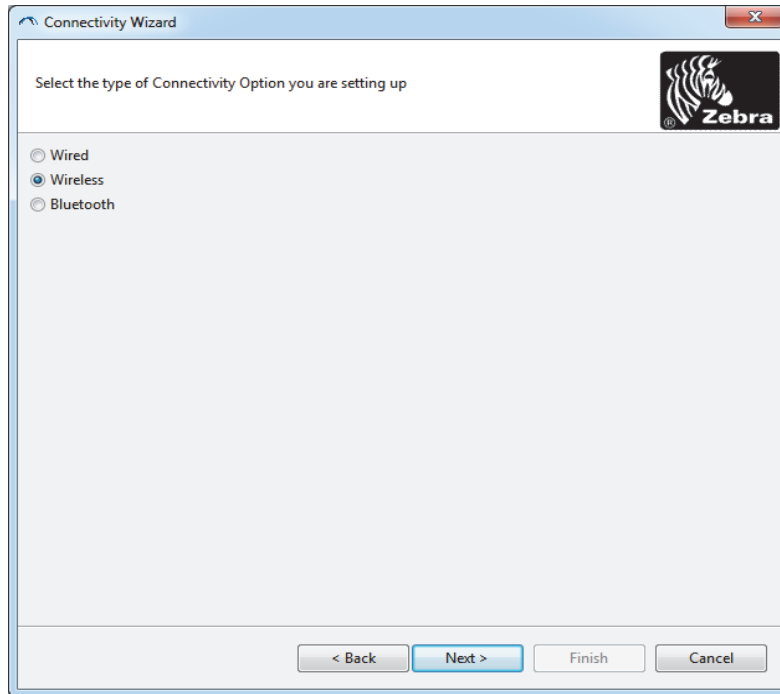
4. From the Choose Port list, select the port to which your printer is connected.
 - If you will save the file without sending it to the printer, you may select any available port.
 - If you select File, you will be asked to browse to the location of the file you want to save.
 - If you select a serial port, the serial 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 be included in the drop-down list.

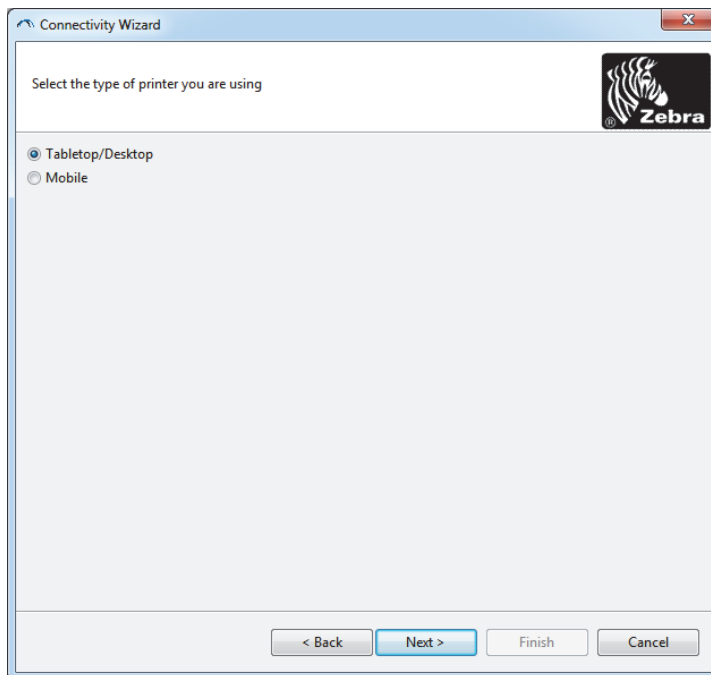
5. Click Next.

The wizard prompts for the print server device to configure.



6. Select Wireless and then click Next.

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



7. Select the type of printer you are using and then click Next.
The wizard prompts for the wireless IP information.

Connectivity Wizard

Select how you want the print server to obtain an IP address.

IP Settings
How do you want the print server to obtain an IP address?
 DHCP
 Static
IP Address:
Subnet Mask:
Default Gateway:

Client ID Settings
Enabled: OFF
Type: MAC ADDRESS
Prefix:
Suffix:

< Back Next > Finish Cancel

8. Enable the DHCP (dynamic) or Static IP option.
 - **DHCP**
 1. Select DHCP and click Next.
 2. Continue with [step 9](#).
 - **Static (IP)**
 3. Select Static.
 4. The IP settings fields are activated.
 5. Enter the IP Address, Default Gateway, and Subnet Mask for the wireless print server. Contact your network administrator for the correct values.
 6. Continue with [step 9](#).

9. Click Next.

The Wireless Settings window opens.

The screenshot shows the 'Connectivity Wizard' window for a Zebra printer. The window title is 'Connectivity Wizard' and it features the Zebra logo in the top right corner. The main text reads: 'Please enter your wireless settings below. All security options may not be available in your printer. Please refer to the Wireless Print Server and Wireless Plus Print Server User Guide for supported security protocols.'

The settings are organized into several sections:

- General Security:** ESSID: 125; Security Mode: None (dropdown); Security Username: (empty); Security Password: (empty).
- WEP Options:** Authentication Type: Open (dropdown); WEP Index: 1 (dropdown); Encr. Key Storage: Hex String; WEP Key 1, 2, 3, and 4: (empty).
- Kerberos Settings:** Kerberos User: (empty); Kerberos Password: (empty); Kerberos Realm: (empty); Kerberos KDC: (empty).
- WPA:** PSK Type: Hex String; PSK Name: (empty).
- EAP:** Optional Private Key: (empty).

At the bottom of the window, there are four buttons: '< Back', 'Next >', 'Finish', and 'Cancel'. The 'Next >' button is highlighted in blue, indicating it is the active step.

10. Enter the ESSID.



Note • The ESSID and pass phrase, if used, must be set at your access point before completing these steps.

11. From the drop-down, select your Security Mode.

- **None** (no security protocol selected)
- **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**

Click Next and continue with [step 12](#).

- **EAP-TLS, EAP-TTLS, EAP-FAST, or WPA-EAP-TLS**

In the EAP section of the window, if necessary, enter the Optional **Private Key**.

Click Next and continue with [step 12](#).

- **PEAP, LEAP, WPA-EAP-TTLS, WPA-PEAP, or WPA-LEAP**

In the General Security section of the window, enter the **Security Username** and **Password**.

Click Next and continue with [step 12](#).

- **WPA-PSK**

In the WPA section of the window:

1. Select the **PSK Type**.
2. Enter the **PSK Name**.

Click Next and continue with [step 12](#)

- **WPA-EAP-FAST**

3. In the General Security section of the window, enter the **Security Username** and **Password**.

4. In the EAP section of the window, if necessary, enter the Optional **Private Key**.

Click Next and continue with [step 12](#).

- **KERBEROS**

In the Kerberos Settings section of the window, enter the following values:

- Kerberos User
- Kerberos Password
- Kerberos Realm
- Kerberos KDC



Note • KERBEROS is not supported on Internal Wireless Plus print servers or radio cards.

Click Next and continue with [step 12](#).

- Click Advanced Options in the Wireless Settings window.
The Advanced Wireless Settings window opens.

Advanced Wireless Settings
Here you can choose your advanced wireless options.

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

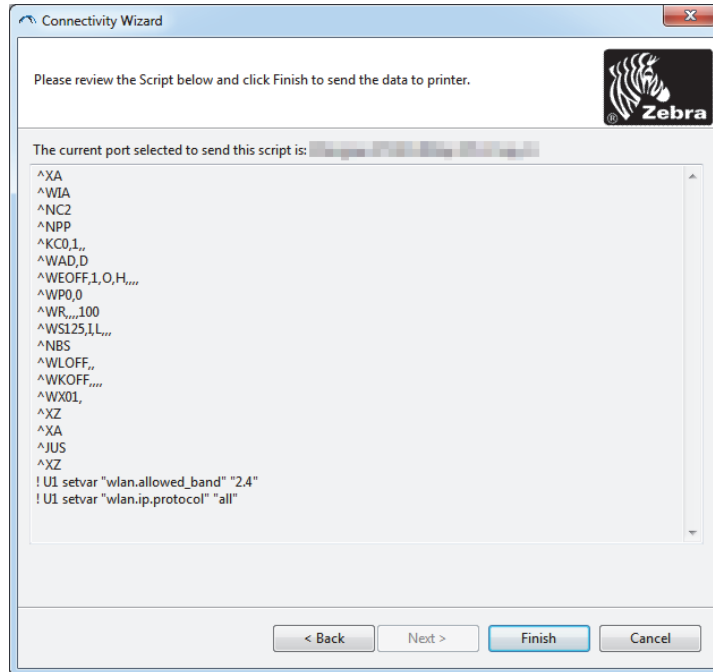
Skip the detection of a wired printserver on boot up?
 Note: If running a wireless printer only this will greatly reduce the time needed to associate on the network.

OK Cancel

- Review the settings in the Advanced Wireless Settings window. Change the settings as necessary, and then click OK. The Wireless Settings window returns.

14. Click Next.

Based on your selections in the Wireless Setup Wizard, the program writes the appropriate ZPL commands and displays them for your review. If you selected Tabletop/Desktop then the a dialog box similar to this displays.



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

Using a Configuration Script

Complete setup by sending the ZPL script to the printer through the port selected at the beginning of this procedure.

1. Verify that the printer is connected to the computer through the wired cable connection to port you selected, USB or Serial.
2. If you have not already done so, turn ON the printer.
3. On the Review and Send ZPL for Wireless window, click Finish.
4. The printer sends the ZPL script to the printer through the selected port. The Wireless Setup Wizard screen closes.
5. Turn the printer OFF and then back ON.

Saving a Configuration Script

Save the ZPL script to a file for use later or for use with other printers.



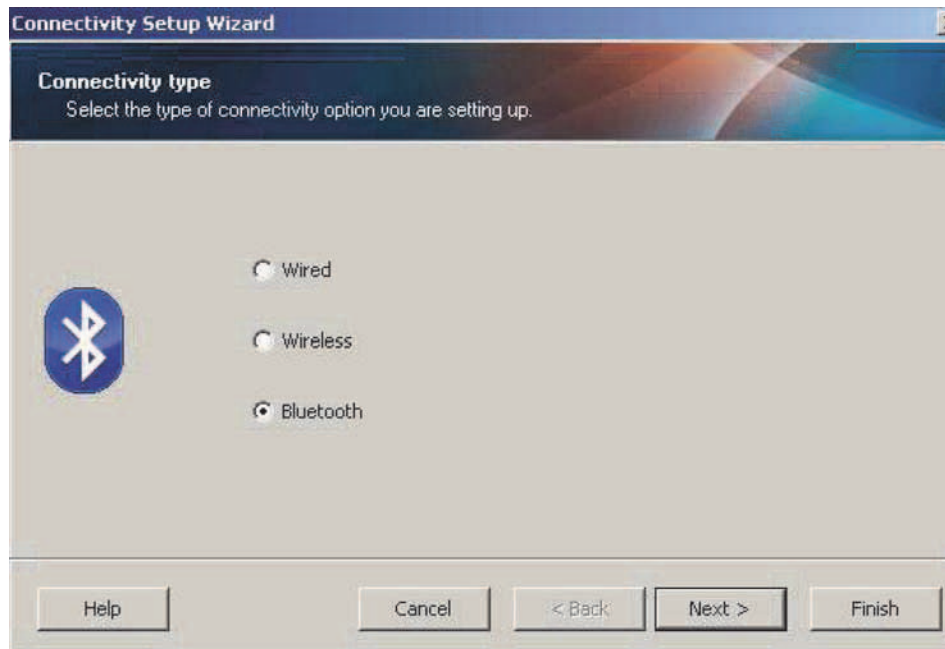
Note • You can send the ZPL script file to multiple printers that use the same configuration, or you can send the file to a printer that had the network settings restored to the factory defaults. This saves you from having to go through the Wireless Setup Wizard more than once.

1. On the 'Review and Send ZPL for Wireless' window, highlight the script, right-click, and select Copy.
2. Open a text editor, such as Notepad, and paste the script into the application.
3. Save the script.
4. In the Connectivity Wizard, click Cancel to exit without sending the script at this time.
5. If you have not already done so, turn ON the printer.
6. Send the ZPL file to the printer through the connection of your choice.
7. Observe the wireless status on the printer's indicator lights, and confirm that you have set up your printer for wireless connectivity.

Bluetooth Option Configuration

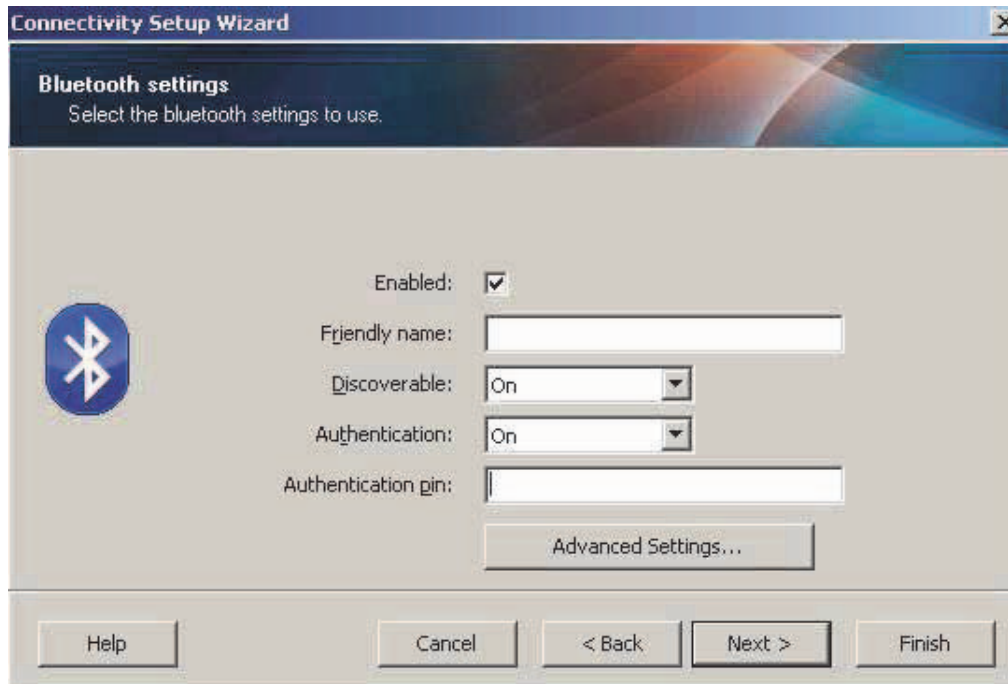
The Zebra Setup Utilities provides a quick and easy way to configure a Bluetooth wireless connection with your printer.

1. Double-click the Zebra Setup Utilities icon on your desktop.
2. Connect a USB cable from your printer to your computer.
3. On the first ZSU screen, highlight the printer displayed in the window and click on the Configure Printer Connectivity where shown.
4. Select 'Bluetooth' on the Connectivity Type screen and click on the Next button.



5. On the Bluetooth Settings screen, check "Enabled" to enable Bluetooth functionality.
6. In the Friendly Name text field, set the Bluetooth name of the device. This name appears during device discovery and the master device will label the printer with this name.
7. Set Discoverable to "On" or "Off" to set whether the device will appear when master devices are looking for new devices to pair with.
8. Set Authentication to "On." (Note: This setting does not exist in Link-OS, but you need to turn on if you want to enter a PIN in ZSU. Actual authentication setting on the printer is set in the Security Mode on the Advanced Settings menu.)

- The values set in the Authentication PIN field will vary depending on the Bluetooth (BT) version of the master device. If the master uses BT v2.0 or older, enter a numeric value in this field. You will be prompted to enter this same value on the master device to verify pairing. Security Mode 2 or 3 in Advanced Settings should also be selected for PIN pairing.



- If the master device uses BT v2.1 or newer, this setting has no effect. BT v2.1 and newer uses Secure Simple Pairing (SSP) which does not require the use of a PIN.
- Clicking on the Advanced Settings button will display the Advanced Bluetooth Settings window. For more information on Advanced Settings, refer to the **Wired and Wireless Print Server Guide**.
- Click Next to continue configuring your printer.
- The SGD commands to properly configure your printer will be displayed. Click Next to continue to the Send Data screen.
- On the Send Data screen, click on the Printer that you want to send the commands to or click on the File button to save the commands to a file for reuse later.
- To send the commands to the printer, click on the Finish button. The printer will update and then reboot. You may disconnect the USB interface from your printer now.
- To complete the Bluetooth pairing process, enable Bluetooth device discovery on your master device and follow the directions provided with the master device.

Connecting to a Windows XP® SP2 Master Device

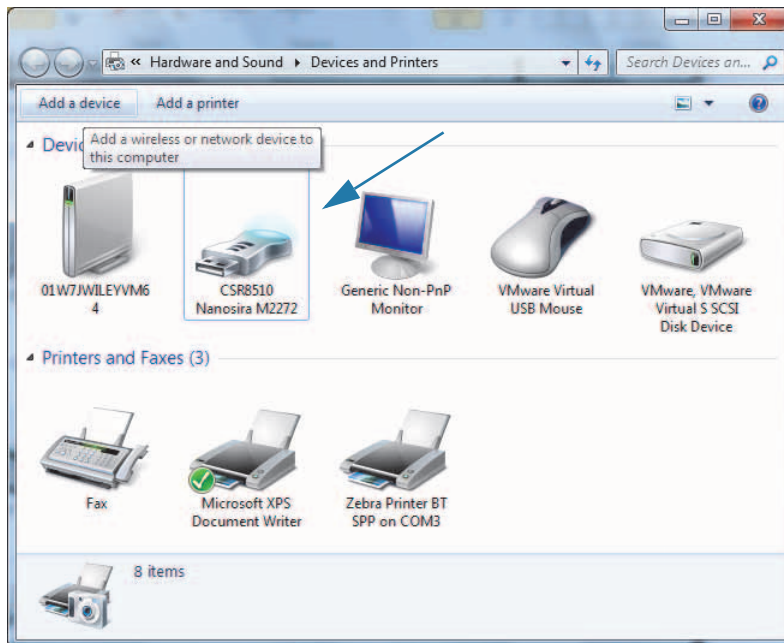
This process covers the printer installation for Windows XP SP2 (or above)

1. From the Windows 'Start' menu, open the 'Printers and Faxes' window. Click on 'Add Printer' and a wizard will start. Click 'Next' when the "Welcome" window displays to continue.
2. Leave the 'Local' radio button with the 'Automatic detect ...' checkbox (checked) selected and click 'Next'.
3. No printer should be found. If there is one or more new printers detected, then do not select any of those printers and click 'Next'.
4. Select the 'Create a new port' radio button and select 'Bluetooth Printer Port' from the associated pull down menu.
5. From the new 'Bluetooth Printer Port' window, select your printer from the Bluetooth devices in the list. This may take several minutes. Click on the 'Connect' button.
6. The 'Install Printer Software' window will open. Select 'ZDesigner' as 'Manufacture' to select supported Zebra printer models, and then select your printer model in the 'Printers' selection. Click 'Next' to continue.
7. Select 'Keep the existing drivers' and click 'Next'.
8. Name your printer and choose your default printer setting as desired. Click 'Next'.
9. Answer 'Yes', you want to print a test page. Click 'Next' to continue.
10. Click 'Finish' on the 'Completing the Add Printer Wizard' window and the Bluetooth printer will complete installation and print a Windows test print page (a Windows logo at minimum).

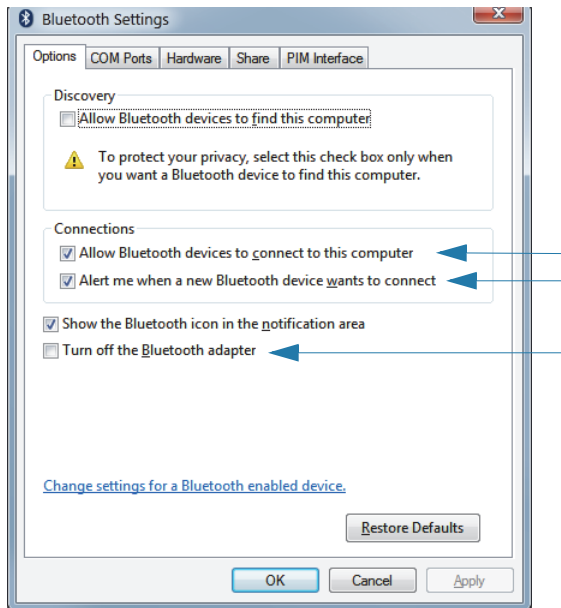
Connecting to a Windows Vista® SP2 or Windows 7® Master Device

The Windows Vista (SP2 or higher) and Windows 7 Bluetooth install differs from the XP install.

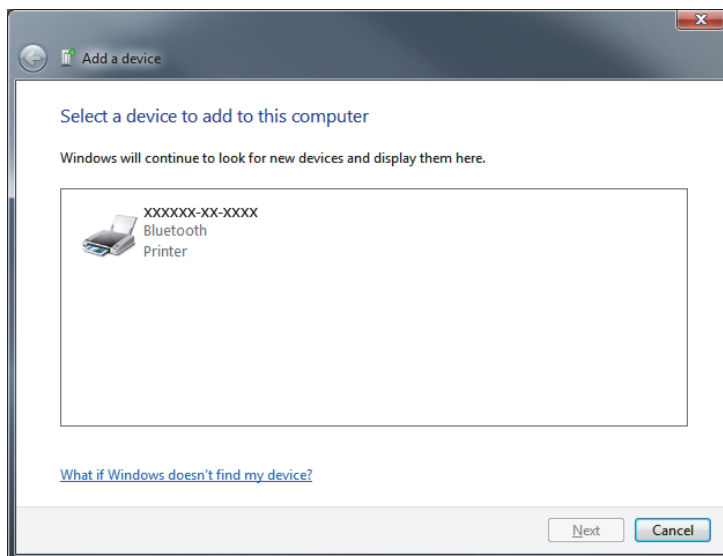
- **Windows Vista:** Open the 'Add Printer' wizard by clicking the 'Start' button, clicking 'Control Panel', clicking 'Hardware and Sound', clicking 'Printers', and then clicking 'Add a printer'.
 - **Windows 7:** Open Devices and Printers by clicking the 'Start' button, and then, on the 'Start' menu, clicking 'Devices and Printers'
 - Some non-Microsoft Bluetooth dongles and built-in Bluetooth devices in the host PC's have marginal driver support for Secure Simple Pairing (SSP) printing and may not complete the 'Add printer' wizard normally. You may need to go to the 'Bluetooth Devices' in the 'Control Panel' or from the system tray on the Windows 'Start' bar and activate SPP for the 'device', your Bluetooth printer you are installing. Install the printer to a local printer (USB or Serial Port for your Link-OS 4 inch Desktop printer) and then change the 'Port' after the install has completed to the SPP (virtual serial port) COM port.
1. Access the 'Devices and Printers' from the Windows Start menu.
 2. Check for Bluetooth devices in the 'Devices and Printers' window. Note the generic Windows Bluetooth icon below.



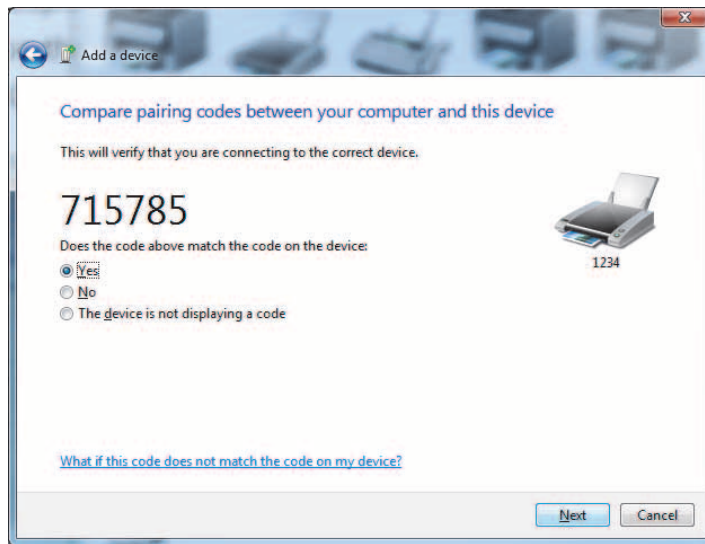
3. Hover over the Bluetooth icon with the mouse pointer and the icon will highlight. Right-Click on the high-lighted Bluetooth icon. Select 'Bluetooth Settings' from the pop-up menu. Verify that both of the Connections check boxes are checked. Verify that the 'Turn off the Bluetooth adapter' is not checked. Click the 'Apply' button. Click the 'OK' button to close the window.



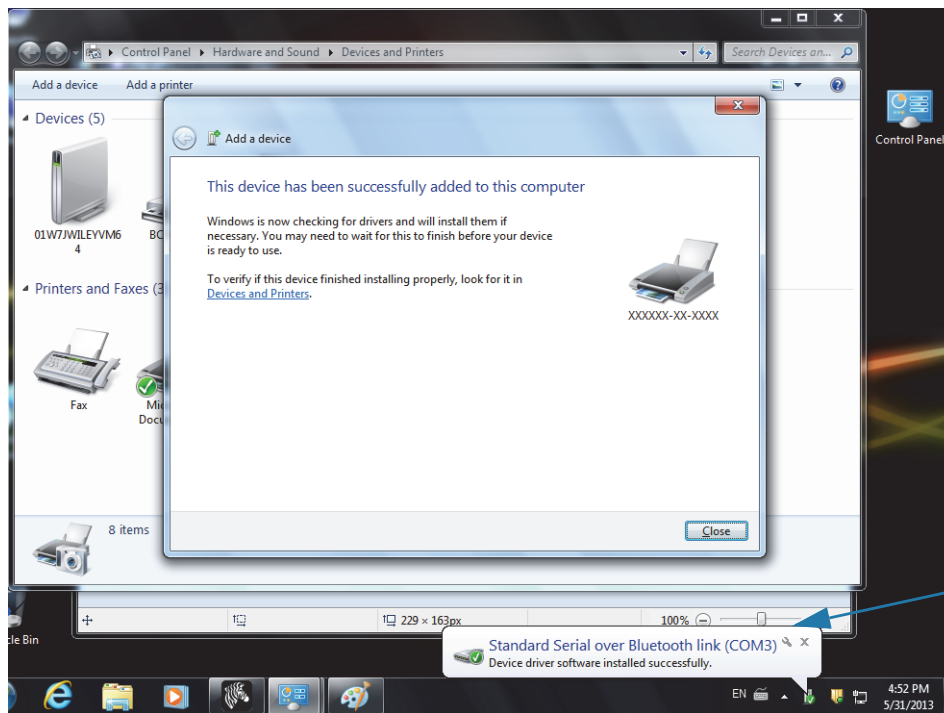
4. Click on the 'Add a device' in the top bar of the "Devices and Printers" window. The "Add a device" windows will populate with Bluetooth devices near you.
5. Turn the Bluetooth 4.0 (3.0 compatible) enabled Zebra printer on. After a few moments the "Add a device" windows will add your new printer. Click on the printer icon. Right-Click and select 'Add device'.



- The printer will print a pairing code. Verify that the pairing numbers match with those on your display screen. If the numbers match, then press the 'Next button' in the 'Add a device' window.



- When the pairing process successfully completes, the following message will be displayed.

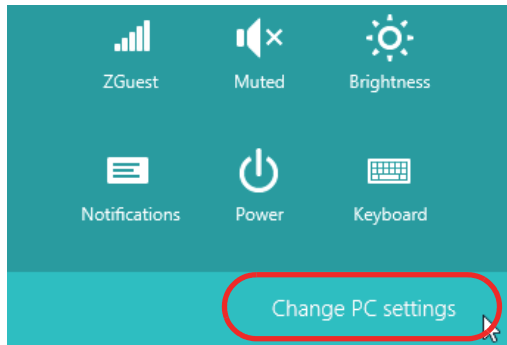


Note • The COM port number displayed in the task bar pop-up. It will only remain for a few seconds.

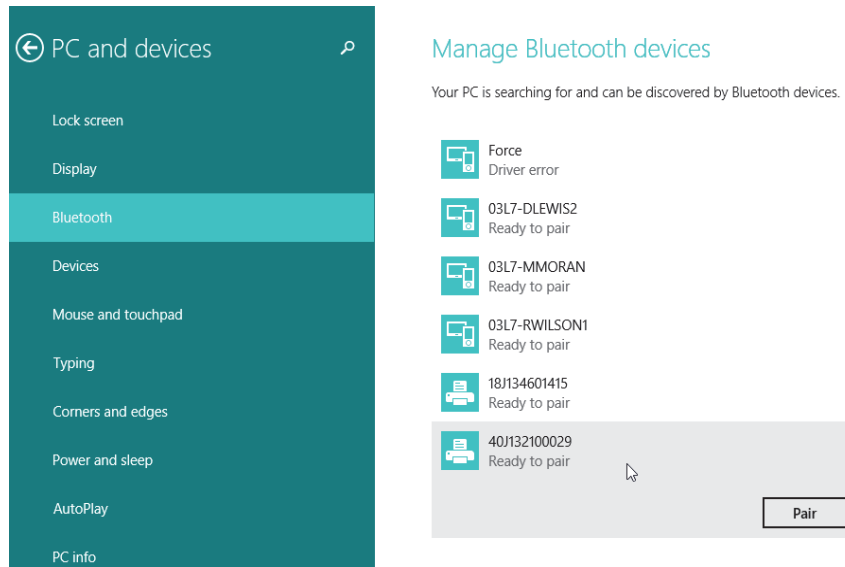
Connecting the Printer to a Windows 8

Before adding (also called pairing) a Bluetooth enabled device, make sure it is turned on and discoverable. As stated in the previous section under [Connecting to a Windows Vista® SP2 or Windows 7® Master Device](#), your Windows device may need a Bluetooth adapter to connect to Bluetooth device. Check with your device manufacturer's User Manual for further information.

1. Swipe in from the right edge of the screen or move your mouse towards the right edge of the screen, select **Settings**, and then select **Change PC Settings**.



2. Select **PC and devices**, and then select **Bluetooth**. Once Windows displays the Bluetooth-enabled devices, select the device and click **Pair**.



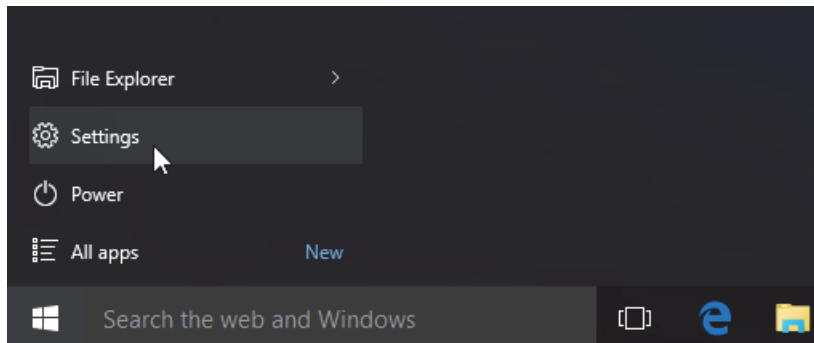
Note • Windows will display the pairing code for only 10 seconds, so complete this step quickly!

3. Follow the instructions on your screen to finish pairing your device.

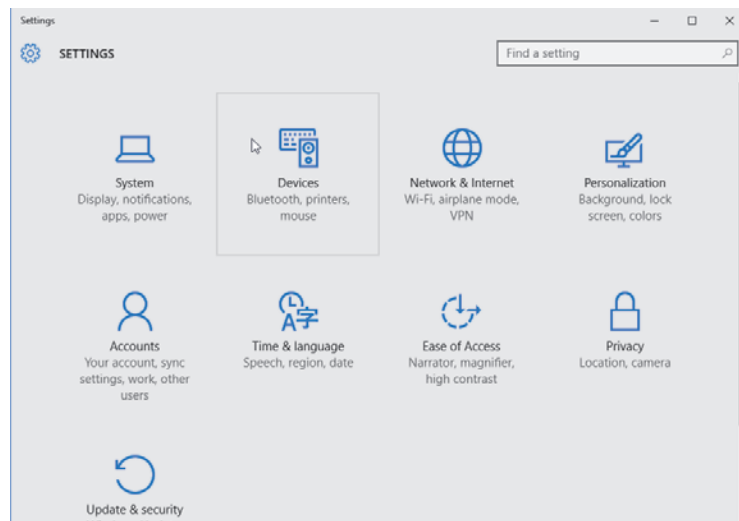
Connecting the Printer to a Windows 10 PC

Before adding (also called pairing) a Bluetooth enabled device, make sure it is turned on and discoverable. As stated in the previous section under “Installing the Printer on a Windows 7 PC,” your Windows device may need a Bluetooth adapter to connect to Bluetooth device. Check with your device manufacturer’s User Manual for further information.

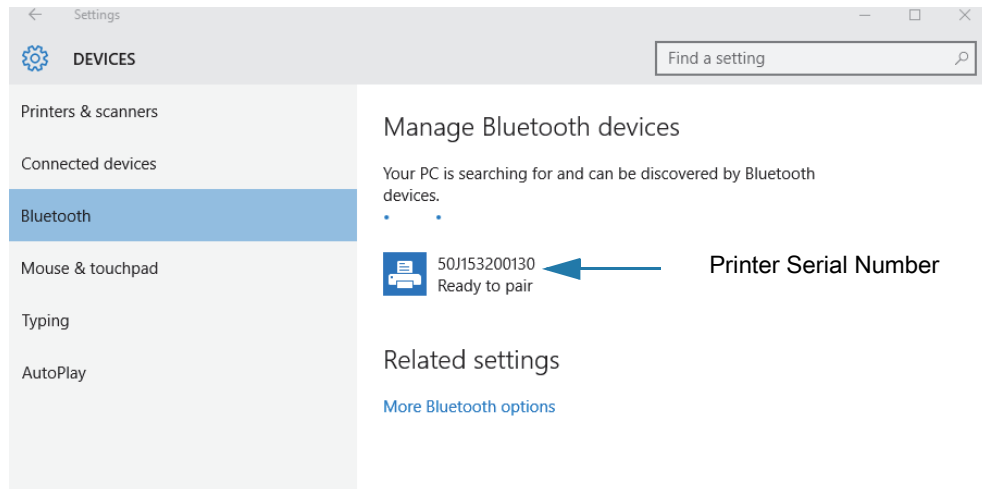
1. Open the Windows Start Menu by clicking on the Windows Start () button and select **Settings**.



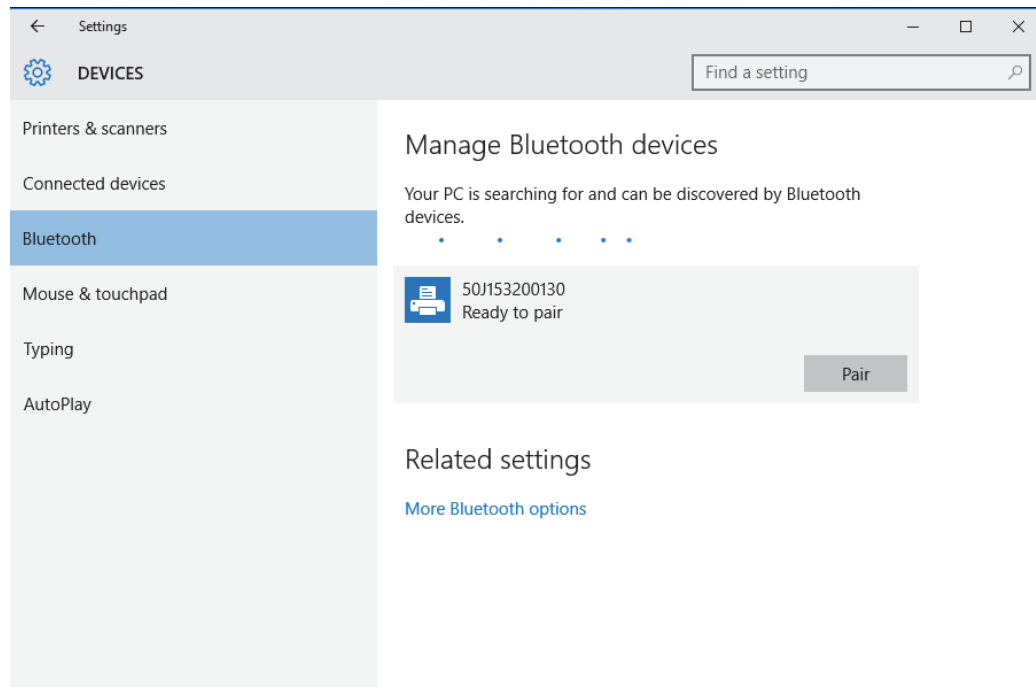
2. Click on the **Devices** category in the Settings window.



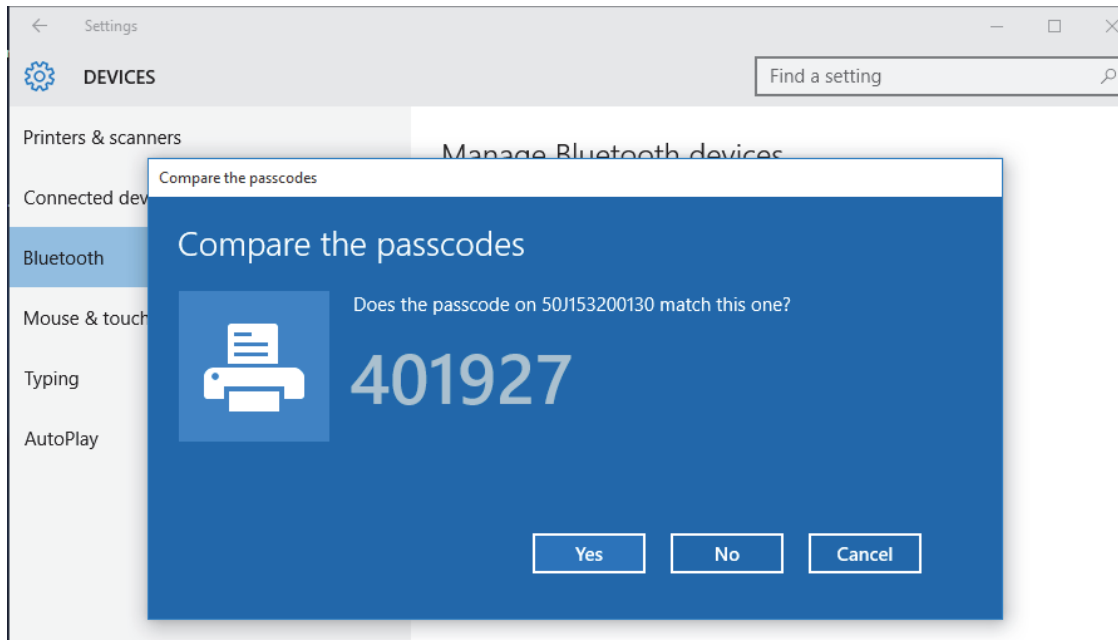
3. Click on Bluetooth. If your PC doesn't have Bluetooth installed, the Bluetooth category will not be displayed in the list of device categories. The printer is identified by the serial number.



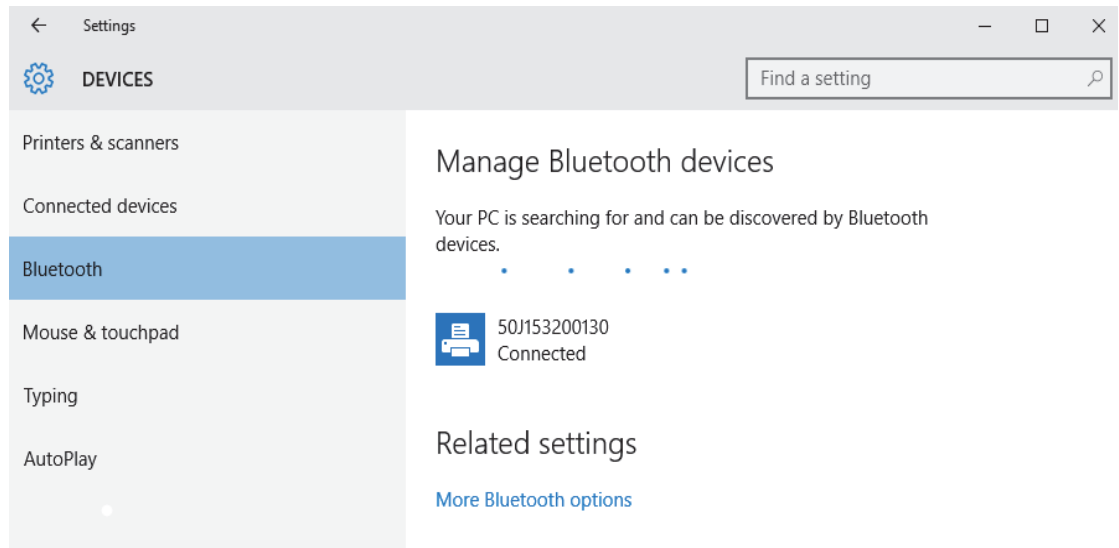
4. Click on the printer and then click on the 'pairing' button for the printer.



- The printer will print a passcode. Compare that with the passcode showing on screen. Click 'Yes' if they match.



- The printer status changes to connected when pairing has completed.



After Your Printer is Connected

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

Testing Communications by Printing

Verifying the print system's operation is a relatively simple process. For Windows operating systems, use the Zebra Setup Utility or the Windows 'Printers and Faxes' Control Panel to access and print a test label. For non-Windows operation systems, copy a basic ASCII text file with a single command (**~WC**) to print a configuration status label.

Test Printing with Zebra Setup Utility:

1. Open the Zebra Setup Utility.
2. Click on the newly installed printer's icon to select the printer and activate the printer configuration buttons below it in the window.
3. Click the 'Open Printer Tools' button.
4. In the 'Print' tab window, click on the 'Print configuration label' line and click on the 'Send' button. The printer should print a configuration report.

Test Printing with Windows 'Printer and Faxes' menu:

1. Click on the Windows 'Start' menu button, to access the 'Printers and Faxes' menu or 'Control Panel' to access the 'Printers and Faxes' menu. Open the menu.
2. Select the newly installed printer's icon to select the printer and right-click the mouse to access the printer 'Properties' menu.
3. From the printer's 'General' tab window, click on the 'Print Test Page' button. The printer should print a Windows test print page.

Test Print with an Ethernet printer connected to a network

Test Print on an Ethernet printer connected to a network (LAN or WLAN) with a (MS-DOS) 'Command Prompt' (or 'Run' from the Windows XP Start menu):

1. Create a text file with the following ASCII three characters: **~WC**
2. Save the file as: **TEST.ZPL** (an arbitrary file name and extension name).
3. Read the IP address off the printer's Configuration Report's Network Status printout. On a system that is connected to the same LAN or WAN as the printer, type the following in the Web browser window's address bar and enter: **ftp (IP address)**.

For IP address 123.45.67.01 it would be: **ftp 123.45.67.01**

4. Type the word 'put' followed by the file name and enter. For this 'test print' file, it would be:
put TEST.ZPL
The printer should print a new Print Configuration Report.

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

1. Create a text file with the following ASCII three characters: ~WC
2. Save the file as: **TEST.ZPL** (an arbitrary file name and extension name).
3. Copy the file to the printer. For DOS, a file sent to a printer connected to the system's serial port would be as simple as:

COPY TEST.ZPL COM1

Other interface connection types and operating systems will have different command strings. See your operating system documentation for detailed instructions 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

The ZD-Series printers use heat to expose direct thermal media or 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 discharges.



Hot Surface 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.



ESD 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.

Determining Your Printer's Configuration Settings

ZD-series printer provide a configuration report of the printer's settings and hardware. Operational status (darkness, speed, media type, etc.), installed printer options (network, interface settings, cutter, etc.) and printer description information (serial number, model name, firmware version, etc.) are all included on the configuration report.

- See [Test Printing with the Configuration Report](#) to print this label.
- See [Managing the ZPL Printer Configuration](#) to help interpret the configuration report and the associated programming command and command states it is identifying in the report.

Select 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 an available print mode:

- See [PRINT MODE](#).
- See the ZPL Programmer's manual, `^MM` command. See [About](#) section for information and support links for your specific printer model.

Print Modes

- **TEAR OFF** — This mode (default) can be used with any printer options and most media types. The printer prints label formats as it receives them. The printer operator can tear off the printed labels any time after they print.
- **PEEL** — Label Dispenser Option only. The printer peels the label from the liner during printing and then pauses until the label is removed.
- **CUTTER** — Cutter Option only. The printer cuts between labels after each one is printed.

Adjusting the Print Quality

Print quality is affected by the heat (density) setting of the printhead, the print speed, and the media in use. Experiment with these settings to find the optimal mix for your application. Print quality can be configured with the Zebra Setup Utility's 'Configure Print Quality' routine.



Note • Media manufacturers may have specific recommendations for speed settings for your printer and the media. The recommended speed may be lower than your printer's maximum speed setting!

The darkness (or density) setting can be controlled by:

- The Set Darkness (`~SD`) ZPL command (consult your ZPL Programming Guide).
- See the [Manual Print Darkness Adjustment](#).
- See the [Darkness Control](#).

If you find that the print speed needs to be adjusted, use:

- The Windows printer driver or application software such as ZebraDesigner™.
- The Print Rate (`^PR`) command (consult your ZPL Programming Guide).

Use the printer's 'Print Quality Report' (also known as the 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. See the [Print Quality Report \(FEED self test\)](#) for details.

The printer's media settings can be verified by printing a Printer Configuration label. See the [Test Printing with the Configuration Report](#) for more details.

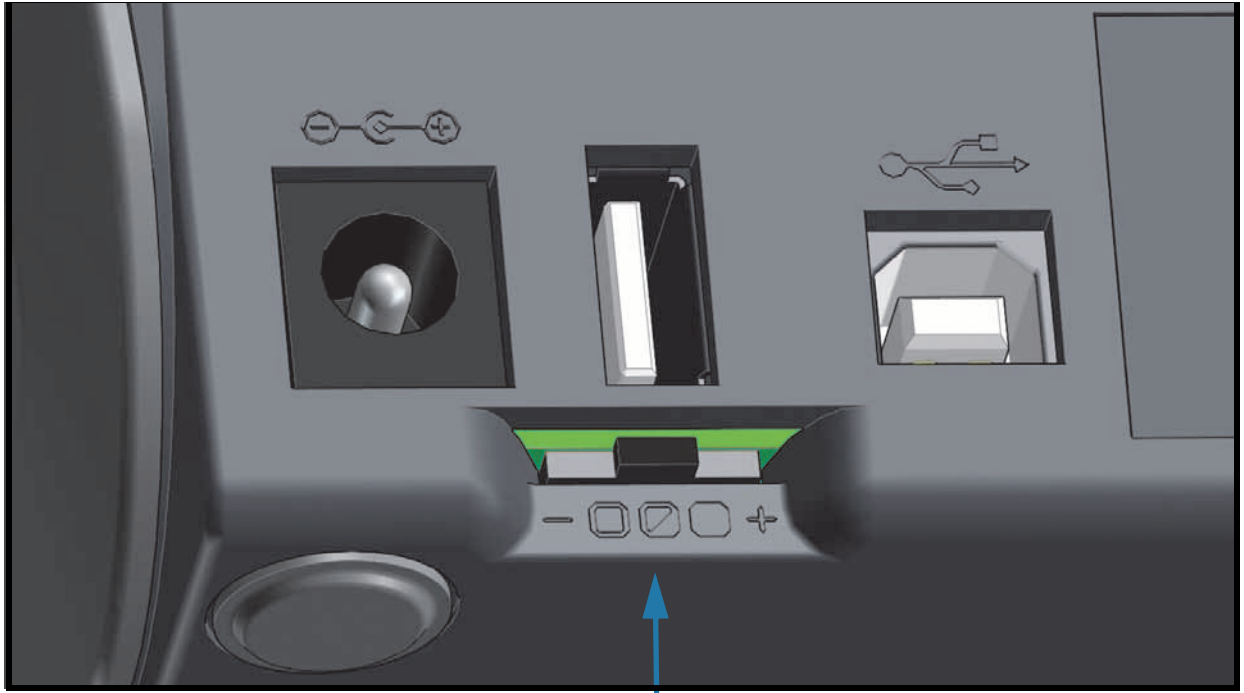
The maximum distance the automatic media type detection and sensing checks can be reduced using the ZPL Maximum Label Length command (`^ML`). The minimum distance should be no less than two times the longest label being printed. If the largest label being printed was a 2 by 6 inch label, then the maximum label (media) length detection distance can be reduced from the default distance of 39 inches down to 12 inches.



Note • See [About](#) section for information and support links for your specific printer model.

Darkness Control

The Darkness Control switch allows the operator to modify the darkness setting for minor variations in media and printers avoiding the need to change the program or driver settings sent to the printer.



Darkness Control

The control switch has three (3) settings:

- **Left** (Low - Default): no effect .
- **Middle** (Medium): increases ZPL darkness 3 levels.
- **Right** (High): increases ZPL darkness 6 levels.

The Low (default) setting makes no change to the actual Darkness setting as set by programming or driver setting. The Medium setting increases the Darkness level by 3, i.e. if the printer is set to the default darkness level of 20, then the actual darkness applied while printing will be 23. The High setting will add six (6) darkness levels to the set darkness level.



Important • Setting the Darkness too high or too low may reduce barcode readability.

Adjusting the Print Width

Print width must be set:

- Before you use the printer for the first time.
- Any time you change the width of the media in use.

Print width may be set by:

- The Windows printer driver or application software such as ZebraDesigner™.
- Controlling printer operations with ZPL programming; refer to the Print Width (^PW) command (consult your ZPL Programming Guide).
- See [Manual Print Width Adjustment](#).



Note • See [About](#) section for information and support links for your specific printer model.

Replacing Supplies while Using the Printer

If media (ribbon, labels, receipts, tags, tickets, etc.) run out while printing, leave the printer power on while reloading (data loss results if you turn off the printer). After you load a new roll of media, press the FEED button to restart.

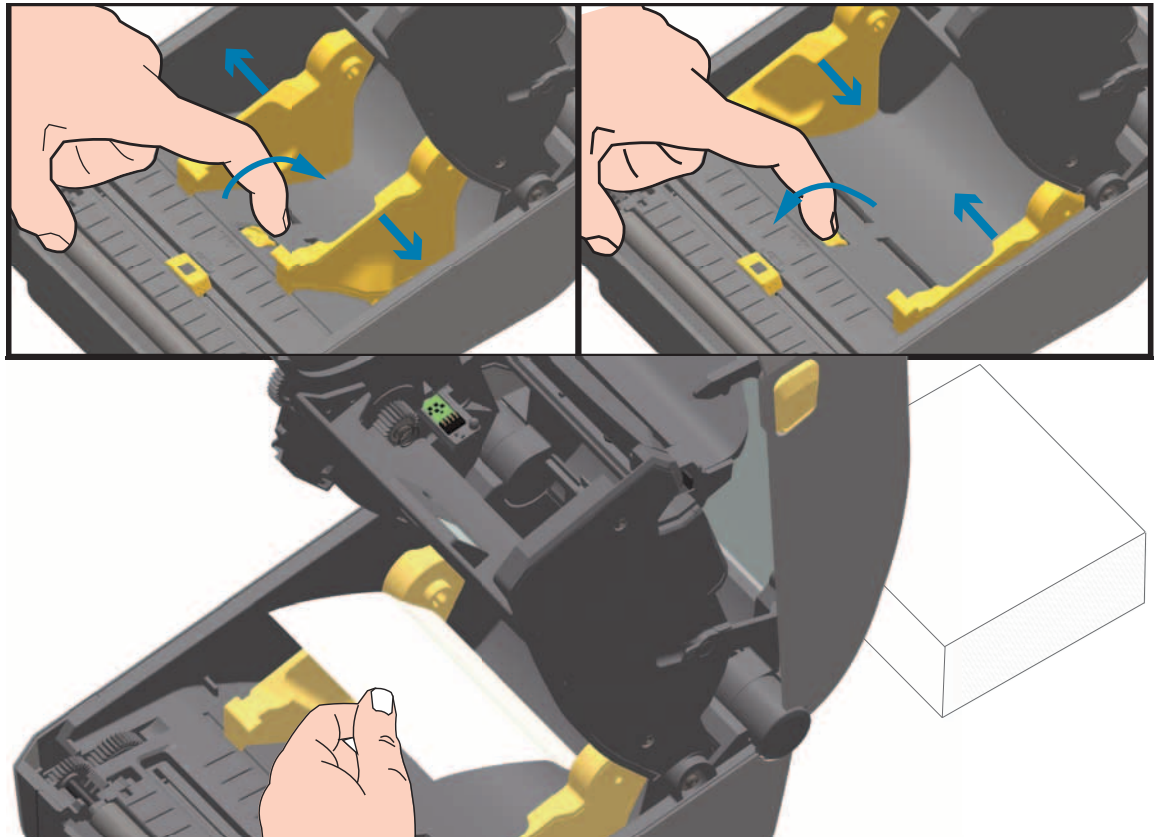
Printing on Fan-Fold Media

Printing on fan-fold media requires you to adjust the media guides stop position.

1. Open the top cover.



2. Adjust the media guide stop position with the gold thumb wheel. Use a piece of the fan-fold media to set the stop position. Rotate the wheel away from you to make the guides wider. Rotate the wheel toward you to make the media guides narrower.



Print Operations

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.

After printing or using the FEED button to advance several labels: If 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, then the media guide stop position may need further adjustment.

If this does not correct the problem, then the media can be routed over the two roll holding pins on the media guide. An empty roll core of the same width as the stack of the fan-fold media can be placed between the roll holders to provide additional support for thin media.

Printing with Externally Mounted Roll Media

The printer accommodates externally mounted roll media similar to the printer's support of fan-fold media. The printer requires the media roll and stand combination to have a low initial inertia to pull the media off the roll.

Externally Mounted Roll Media Considerations:

- The media ideally should enter the printer directly behind the printer through the fan-fold media slot in the rear of the printer. See [Printing on Fan-Fold Media](#) for media loading.
- Lower the print speed to decrease the chance of motor stalls. The roll typically has the highest inertia when trying to start the roll moving. Larger media roll diameters require the printer to have more torque applied to get the roll moving.
- The media should move smoothly and freely. The media should not slip, skip, jerk, bind and then move, etc. when mounted on your media stand.
- The printer should not touch the media roll.
- The printer should not slip or lift up off the operating surface.

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 dispense-mode, set 'Media Handling' to 'Peel-Off' in the printer driver or with the Zebra Setup Utility using the 'Configure Printer Settings' wizard. Otherwise, you must 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 the **FEED** button until a minimum of 100 millimeters or 4 inches of exposed labels exit the printer. You can leave the labels on the liner.



Print Operations

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.



Print Operations

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 the FEED (Advance) button 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.



Note • 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 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 Utility using the 'Configure Printer Settings' wizard. Otherwise, you must 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
```

Linerless Printing

- Linerless media loads the same as models with the standard 'tear-off' bezel or the general cutter factory options. See [Loading Roll Media](#).
- **Media Reloading** - Clean the printhead and inspect the media path and platen roller for build up of adhesive and debris. 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 [Linerless Platen \(Drive\) Roller](#) cleaning procedure.
- **Don't remove new media from it's protective wrapping** until you are ready to place it in the printer. Setting the roll on its side will pick up contaminants and may 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 can get dislodged when using printer. These particle clumps can then get transferred to other areas.

Sending Files to the Printer

Graphics, fonts and programming files can be sent to the printer from the Microsoft Windows operating systems by using the Link-OS Profile Manager, Zebra Setup Utilities (and driver), ZebraNet™ Bridge or Zebra® ZDownloader found on the Zebra Web site:

www.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 SGD "ribbon" commands in particular. 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"
```

The Zebra Setup Utilities may be used to send commands and receive status back from the printer using the 'Open Communication With Printer' feature.

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 2 hours to charge a fully discharged battery.

UPS Mode

The printer is receiving the external power passed through by the battery circuitry into the printer.

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".
2. The battery is in Sleep Mode awaiting the loss of external power to the battery (and attached printer).

The printer can be turned OFF and ON normally and does not require the battery be turned on to operate.

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.
2. Turn the printer ON.
3. Use the printer normally.
4. Check the battery charge status at any time by pressing the Battery Control Button.
5. Change or charge your battery when the last battery charge level indicator is flashing. 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 your language and font requirements. The ZPL™ programming language provides advanced font mapping and scaling technology to support outline fonts (TrueType™ or OpenType™) and Unicode character mapping as well as basic bitmapped fonts and character code pages.

The printer's font capabilities are programming language dependent. The ZPL and the legacy EPL programming guides describe and document the fonts, code pages, character access, listing fonts, and limitations for their respective printer programming languages. See the printer programming guides for information on Text, Fonts and Character support.

Zebra has variety of utilities and application software that support font download to the printer for ZPL and EPL printer programming languages.



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 via a font activation and installation utility. EPL fonts do not have this restriction.

Identifying Fonts in Your Printer

Fonts and memory are shared by the programming languages in the printer. Fonts can be loaded into various storage locations in the printer. ZPL programming can recognize EPL and ZPL fonts. EPL programming can only recognize EPL fonts. See the respective programmer guides for more information on fonts and printer memory.

ZPL Fonts

- To manage and download fonts for ZPL print operation, use the Zebra Setup Utility or ZebraNet™ Bridge.
- To display all of the fonts loaded in your printer, send the printer the ZPL command `^WD`. See the ZPL Programmers Guide for details.
 - Bitmap fonts in the various printer memory areas are identified by the `.FNT` file extension in ZPL.
 - Scalable fonts are identified with the `.TTF`, `.TTE` or `.OTF` file extensions in ZPL. EPL does not support these fonts.

Localizing the Printer with Code Pages

The Link-OS 4 inch Desktop printer supports two sets of language, region and character sets for permanent fonts loaded into the printer for each printer programming language, ZPL and EPL. The printer supports localization with common international character map code pages.

- For ZPL code page support, including Unicode, see the `^CI` command in the ZPL programmer's guide.

Asian fonts and Other Large Font Sets

Asian language ideographic and pictographic fonts have large character sets with thousands of characters that support single language code page. In order to support the large Asian character sets, the industry adopted a double-byte (67840 maximum) character system instead of the single-byte characters (256 maximum) used by Latin based language characters to address large font sets. In order to address multiple languages with a single font set, Unicode was invented. A Unicode font supports one or more code points (relate these to code page character maps) and is accessed in a standard method that resolves character mapping conflicts. The ZPL programming language supports Unicode. Both of the printer's programming languages support the large pictographic double-byte character Asian font sets.

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

Some Unicode fonts are large such as MS (Microsoft) Arial Unicode font (23 MB) available from Microsoft or the Andale font (22 MB) offered by Zebra. These large font sets typically support a large number of languages as well.

Getting Asian Fonts

Asian bitmap font sets are downloaded into the printer by the user or integrator. The ZPL fonts are purchased separately from the printer. EPL Asian Fonts are available for free to download from the Zebra Web site.

- Simplified and Traditional Chinese
(The SimSun scalable 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 (point of sale - POS), shipping, inventory, work flow control, and general labeling. EPL printers with Line Mode, are versatile and are capable of printing a wide range media and bar codes.

Line Mode printing only prints single lines the height of the largest element present in the line of text and data - bar code, 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) bar codes.

- Line Mode printer operation is entered by sending the printer the EPL **OEPL1** command. See the EPL Programmers Guide (Page Mode) or the EPL Line Mode Programmers Guide.
- Line Mode printer operation is exited by sending the printer the **escOEPL2** Line Mode command. See the EPL Line Mode Programmers Guide.
- With Line Mode active, ZPL and EPL (EPL2) Page Mode programming will be processed as Line Mode programming and data.
- With the default ZPL and EPL (EPL2) Page Mode 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 as a Healthcare printer only. The Locking Printer's features are:

- 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's features, see [ZD620 Locking Printer Features](#).

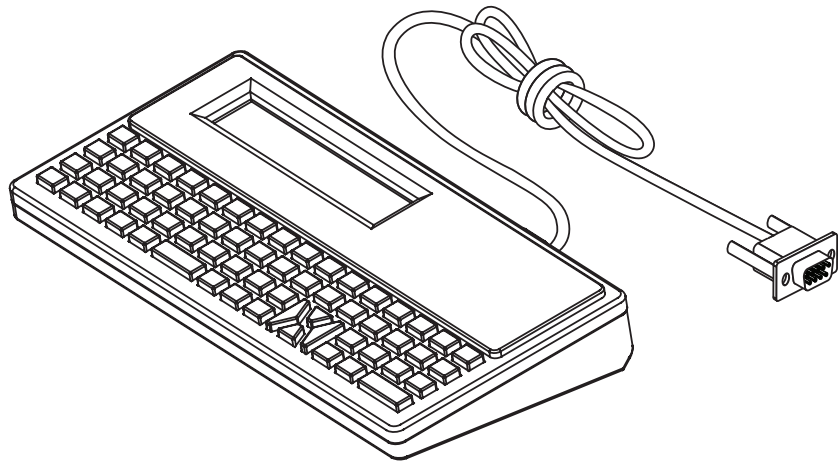
Zebra® ZKDU — Printer Accessory

The Zebra® ZKDU (keyboard display unit) is a small terminal unit that interfaces with the printer for accessing EPL or ZPL label forms stored in the printer.

The ZKDU is strictly a terminal and does not have the capability to store data or set up parameters.

The ZKDU is used for the following functions:

- List label forms stored in printer
- Retrieve label forms stored in printer
- Input variable data
- Printing labels
- Switching between EPL and ZPL to dual support both printer language format/form types that can be stored and printed in many later model Zebra label printers.



ZBI 2.0™ — Zebra Basic Interpreter

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.
- Use the ZBI Key Manager (also know 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 at the Zebra Web site:

Go to the Zebra Web site and search for Zebra Basic Interpreter 2.0.

www.zebra.com/software

Setting the Power Failure Recovery Mode Jumper

The printer can be configured to re-start itself after a power failure, unattended, with Power Failure Recovery Mode.



Note • The 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 set to OFF. With the jumper set to ON, the printer will automatically Power ON when plugged into an active (ON) AC power source (and not power off).



ESD 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.

Setting the Jumper

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 Printer Connectivity Modules](#) for instructions for ZD420 printer models. The connectivity module on a ZD620 printer model is removed like a ZD420 printer's module.
3. Move the AUTO (Power Failure Recovery Mode) jumper from the OFF position to the ON.
4. Reinstall the connectivity module and module access door. See [Installing the Internal Ethernet \(LAN\) Module](#) or [Installing the Serial Port Module](#) for ZD420 printer models. The connectivity module on a ZD620 printer model is installed like a ZD420 printer's module.
5. Reconnect the printer DC power plug and interface cables to the printer.

USB Host Port and Link-OS Usage Examples

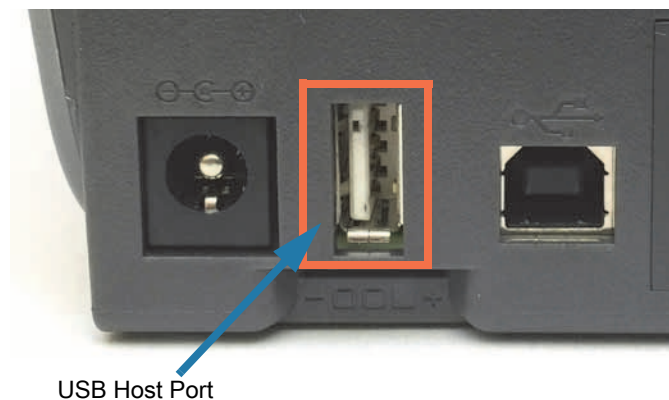
This section has information on using the printer's USB Host port along with Link-OS features and Apps (applications).

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.

USB Host Port Uses

- Firmware updates
- File transfers and management
- A port for low power USB data entry devices (keyboards, scales, scanners, and other wedge devices).



Important • The USB Flash drive must be formatted with the FAT file system. Filenames may be 1 to 16 alphanumeric characters (A, a, B, b, C, c, ..., 0, 1, 2, 3, ...) only. Only use ASCII characters. Do not use Asian characters, Cyrillic characters, or accented characters in file names. Some functions may not work properly if there are underscores in a file name. Use periods instead.

Using USB Host for Firmware Updates

The USB host port allows you to connect an USB Flash drive to the printer to perform firmware updates.

This is an example of using the powerful printer management, Zebra Mirror functions. See the printer ZPL programming manual — **Mirror** and **Set-Get-Do** (SGD) `usb.mirror` commands operation.



Note • See [About](#) section for information and support links for your specific printer model.

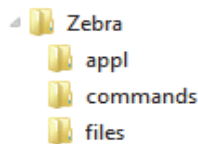


Important • Supports USB Flash drives (or “thumb drive” or “memory stick”) up to 1 Terabyte (TB). The printer will not recognize drives larger than 1 TB.

Flash Drive Preparation and Firmware Update

1. On your USB Flash Drive, create the following:

- a folder called Zebra
- in that folder, create three sub-directories:
 - appl
 - commands
 - files



2. In the `/appl` folder, place a copy of the latest firmware for your printer.

3. Load the printer with media. See [Loading Roll Media](#).

4. Insert the USB Flash drive into the USB host port on your printer.

5. Observe the user interface and wait.

If the firmware version on the USB Flash drive is different than the version installed on the printer, the firmware will download to the printer. The data indicator will flash green while the firmware is downloading. The printer will restart with all indicators flashing. When the firmware update has completed, the STATUS indicator will display solid Green as the firmware is validated and installed. The ZD620 printer will display firmware download status messages on the LCD (and with the default [IDLE DISPLAY](#) mode set, the LCD shows the firmware version). A printer Configuration Report is automatically printed and the firmware update has been completed.

6. Remove the USB Flash drive from the printer.

USB Host and Printer Usage Examples

The exercises in this section will teach you how to perform USB mirror (using an alternate firmware update procedure), how to transfer files to and from the printer, and how to provide information for which you are prompted and then print a label using that information.

Items Required for the USB Host Exercises

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

- USB Flash drive up to 1 Terabyte (TB). The printer will not recognize drives larger than 1 TB.
- USB keyboard.
- Various files referenced below (from files attached inside this PDF file)
- Free Zebra Utilities app for your smart phone (search for Zebra Tech in the Google Play store).

Files for Completing the Exercises

Most of the actual files that you need to complete the exercises in these section are attached here in the PDF file. Copy these files to your computer before you begin the exercises. Where possible, the contents of the files are shown. The contents of files that contain coded content, which cannot be viewed as text or as an image, are not included.

File 1: ZEBRA.BMP



File 2: SAMPLELABEL.TXT

```
^XA  
^FO100,75^XGE:zebra.bmp^FS  
^FO100,475^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
^FO385,75^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 operator

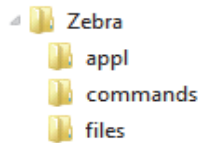
File 8: SMARTDEVINPUT.ZPL

```
^XA
^CI28
^BY2,3,91^FT38,184^BCN,,Y,N^FC%,{,#^FD%d/%m/%Y^FS
^FO385,75^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: Copy Files to a USB Flash Drive and Perform 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.

2. In the **/files** folder, place the following file:

- **File 1: ZEBRA.BMP**

3. In the **/commands** folder, place the following files:

- **File 2: SAMPLELABEL.TXT**
- **File 3: LOGO.ZPL**

4. Insert the USB Flash drive into a USB host port on the front of your printer.

5. 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.**

6. Remove the USB Flash drive from the printer.

Table 1

Exercise 1: Advanced User Information
<p>See the ZPL Programming Guide for more information about these commands.</p> <p>Enable/disable mirroring:</p> <p>! U1 setvar "usb.mirror.enable" "value" — Values: "on" or "off"</p> <p>Enable/disable automatic mirroring that occurs when a USB Flash drive is inserted into the USB host port:</p> <p>! U1 setvar "usb.mirror.auto" "value" — Values: "on" or "off"</p> <p>Mirror Operation Retry Number — Specify the number of times that the mirror operation will be repeated if it fails:</p> <p>! U1 setvar "usb.mirror.error_retry" "value" — Values: 0 to 65535</p> <p>Change File Path FROM USB — Reprogram the file location the printer searches to retrieve files from the USB memory during Mirror operations.</p> <p>! U1 setvar "usb.mirror.appl_path" "new_path" — Default: "zebra/appl"</p> <p>Change File Path TO USB — Reprogram the file location the printer places files into USB memory during Mirror operations.</p> <p>! U1 setvar "usb.mirror.path" "path" — Default: "zebra"</p> <p>Enable/disable the USB Host port</p> <p>! U1 setvar "usb.host.lock_out" "value" — Values: "on" or "off"</p>

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. Only printable files (.ZPL and .XML) may be printed from the USB mass storage device, and the files must be located at the root level, not in 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 the LEFT SELECT button (below the home icon) to access the printer's Home Menu.
4. Use the ARROW buttons to scroll to the Tools menu and 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. **SELECT ALL** 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 the RIGHT SELECT button 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 following files 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 the LEFT SELECT button to access the printer's Home Menu.
4. Use the ARROW buttons to scroll to the Tools menu and press SELECT (check mark icon).
5. Use the ARROW buttons to scroll to **COPY USB FILE TO E:**.

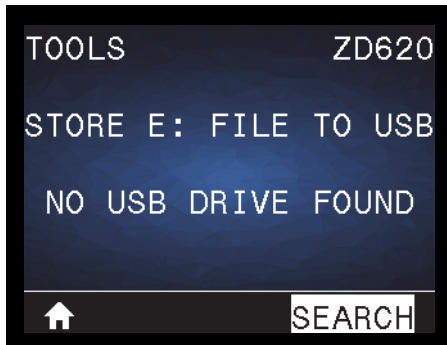


The printer loads any executable files and processes them. The available files are listed. **SELECT ALL** is available to copy all of the available files from the USB Flash drive.

6. If necessary, use the UP or DOWN ARROW to select the file **STOREFMT.ZPL**.
7. Press the RIGHT SELECT button to select **STORE**.
8. The printer stores the file in **E:** memory. All file names are converted to uppercase.
9. Repeat this process to select the file **STOREFMTM1.ZPL**.
10. Press the RIGHT SELECT button to select **STORE**. The printer stores the file in **E:** memory.
11. Remove the USB Flash drive from the USB host port.



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

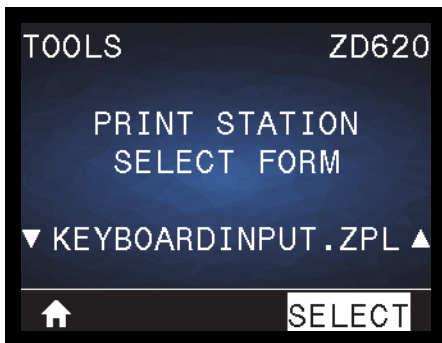


The option **SELECT ALL** is available to store all of the available files from the printer to the USB Flash drive. Any **.ZPL** file that is copied will be post-processed such that the contents of the file will be suitable to be sent to a printer for normal execution.

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.
2. Use the ARROW buttons to scroll to the Tools menu (YT).
3. Press OK.
4. Use the ARROW buttons to scroll to **PRINT STATION**.



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

5. If necessary, use the UP or DOWN ARROW to select the file **KEYBOARDINPUT.ZPL**.
6. Press the RIGHT SELECT button to choose **SELECT**.
7. 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.
8. Type your name, and then press <ENTER>. The printer prompts for the number of labels to print.
9. Specify the desired quantity of labels, and then press <ENTER> again.

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

Using the USB Hosts Port and the NFC Capabilities

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. This capability allows you to use your device to provide information for which you are prompted and then print a label using that information.



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.



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: <http://www.zebra.com/manuals>.

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 the printer.
 1. If necessary, access the Bluetooth information about your printer using your smart device. For instructions, refer to the manufacturer's documentation for your device.
 2. If necessary, select the Zebra printer's serial number to pair it with the device.
 3. After your smart device has been detected by the printer, the printer may prompt you to accept or reject the pairing. If necessary, press the LEFT SELECT button on the printer to select ACCEPT. Some smart devices will pair with the printer without this prompt.



The printer and your device are paired.

3. Start the Zebra Utilities app on your device. The Zebra Utilities main menu displays.



4. Perform these steps if you have an Apple device:
 5. Tap the Settings icon (⚙️) in the lower-right corner.
 6. Change the setting for **Get Labels From Printer** to **ON**.
 7. Tap Done.
 8. Tap Files.

The smart device gets data from the printer and displays it.



Note • 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. Change the quantity of labels to print, if desired.
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 your printer functional and printing high quality labels, receipts, tags, etc.

Cleaning Supplies

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

- **Printhead Cleaning Pens** for simple operator printhead cleaning
- **99% pure Isopropyl Alcohol** (Use a labeled dispenser. Never re-moisten cleaning materials used to clean the printer).
- **Fiber-free Cleaning Swabs** for media path, guides, and sensors **and Cleaning Wipes** for media path and interior (for example Kimberly-Clark Kimwipes).
- **Can of Compressed Air.**



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.



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



Important • Do Not Use an air compressor in place of the can of compressed air. Air compressors have micro contaminants and particles that get into the air system and damage your printer.



Eye Injury Caution • Use eye protection to protect your eyes from flying particles and objects when using compressed air.

Get Zebra Supplies and Accessories for Cleaning Your Printer

Go to the Zebra Web site: www.zebra.com/accessories

Recommended Cleaning Schedule

Printhead

Interval: Clean the printhead after every 5 rolls printed.

Procedure: [Cleaning the Printhead](#)

Standard Platen (Drive) Roller

Interval: 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.).

Procedure: See [Platen Cleaning and Replacement](#).



Note • Standard platen rollers come in two colors, black (203 dpi) and gray (300 dpi).

Linerless Platen (Drive) Roller

Interval: If there is observed build-up of particles on the platen roller, use this procedure. The linerless platen normally does not require cleaning. The adhesive side of the media picks up particles as you print.

If the linerless media is sticking and binding in the printer, the linerless platen normally needs to be replaced. The silicon non-stick coating has been used up.



Important • Linerless platen rollers come in two colors, reddish-brown (203 dpi) and brown (300 dpi).



Important • 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.



Important • 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.

Procedure: 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 [Platen Cleaning and Replacement](#) procedure to get better access for particle removal.

Media Path

Interval: Clean as needed.

Method: Clean it thoroughly with fiber-free cleaning swabs and cloths moistened with 99% isopropyl alcohol. Let alcohol evaporate completely.

Procedure: See [Media Path Cleaning](#).

Interior

Interval: Clean the printer as needed.

Method: Use 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.

Exterior

Interval: Clean as needed.

Method: Use 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.

Healthcare Printer Models — The latest models now include Ultra-Violet (UV) and disinfectant-ready plastics for hospital and other similar environments. The user control's 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 Web site for the latest information on tested and approved cleaning materials, and cleaning methods.

Label Dispenser Option

Interval: As needed to improve label dispensing operations.

Procedure: See [Label Dispenser Option](#) cleaning.

Cutter Option

Interval: Not an operator serviceable component. **Do Not Clean** inside the cutter opening or blade mechanism. You may use the Exterior cleaning to clean the cutter bezel (housing).

Method: Call a service technician.

Procedure: Not applicable.



Cut Warning • 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 • 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 bind.

Cleaning the Printhead

Always use a new cleaning pen on the printhead (an old pen carries contaminants from its previous use that may damage the printhead).

When you load new media, you should clean the printhead for optimal print operations.



Hot Surface 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.

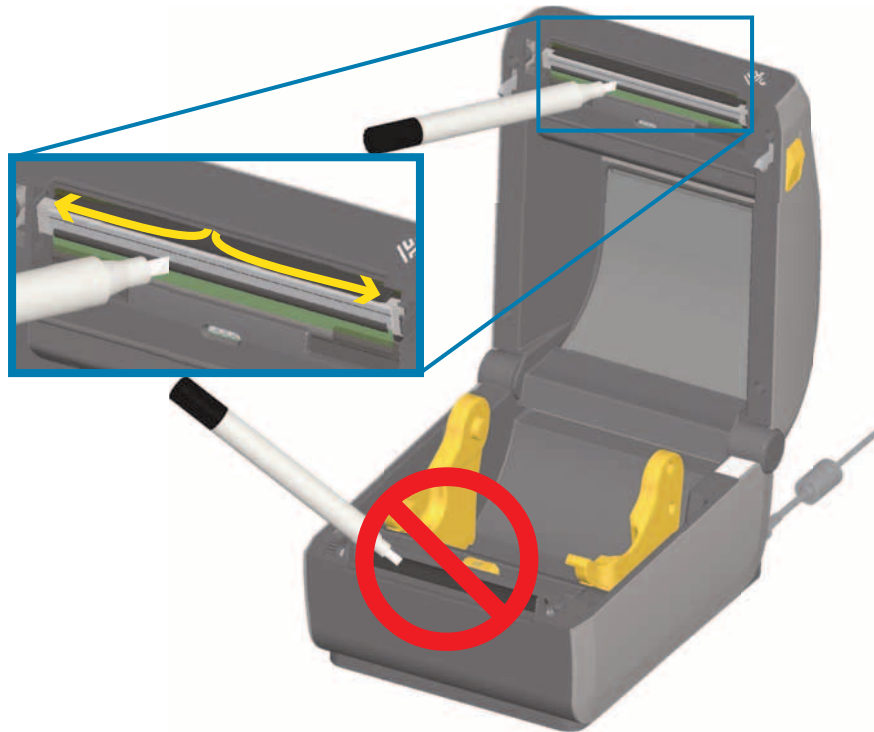


ESD Caution • The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead and other electronic components used in this device. You must observe static-safe procedures when working with the printhead or the electronic components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

ZD620 / ZD420 Direct Thermal Printers

When you load new media, you can also clean the printhead.

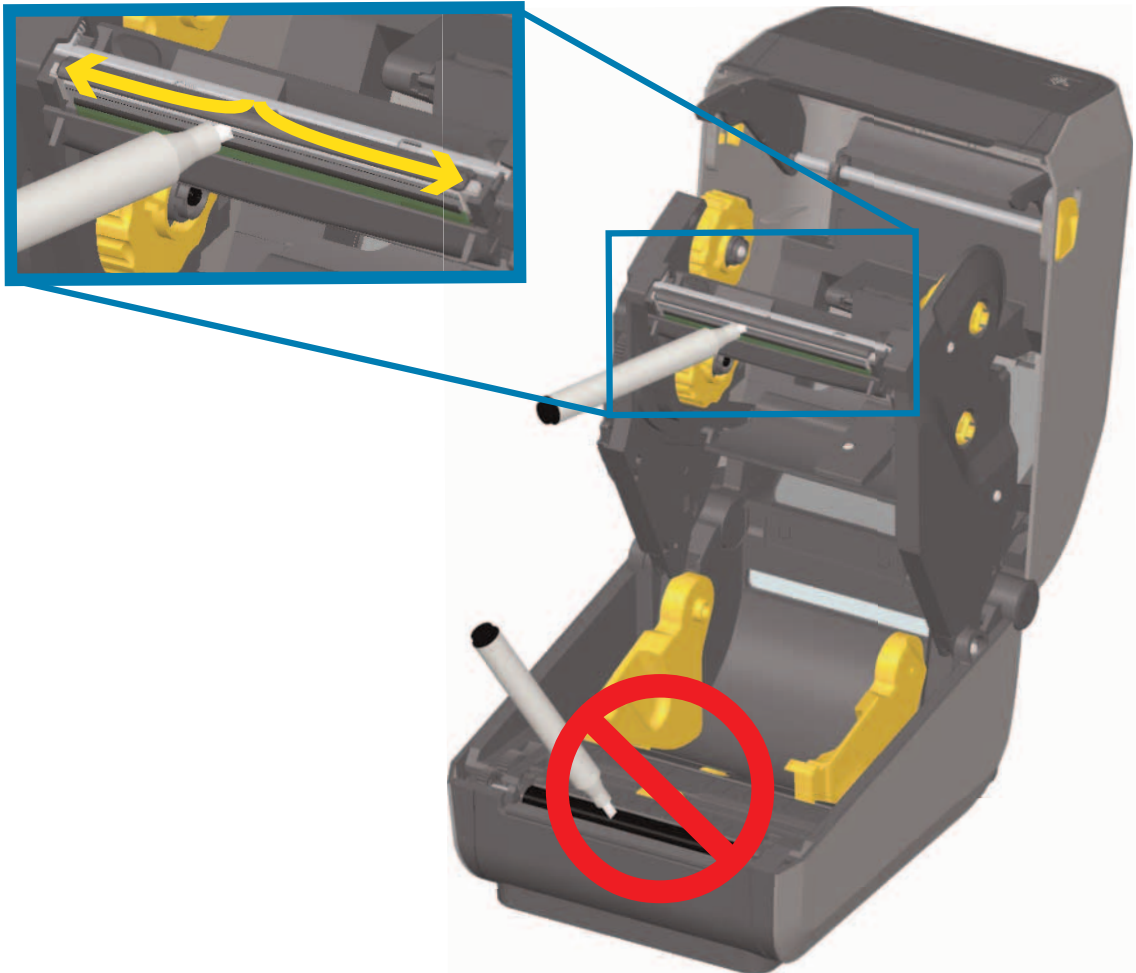
1. Rub the cleaning pen across the dark area of the printhead. Clean from the middle to the outside. This will move adhesive transferred from the edges of media to the outside of media path.
2. Wait one minute before closing the printer to allow the components to dry.



ZD620 / ZD420 Thermal Transfer Printers

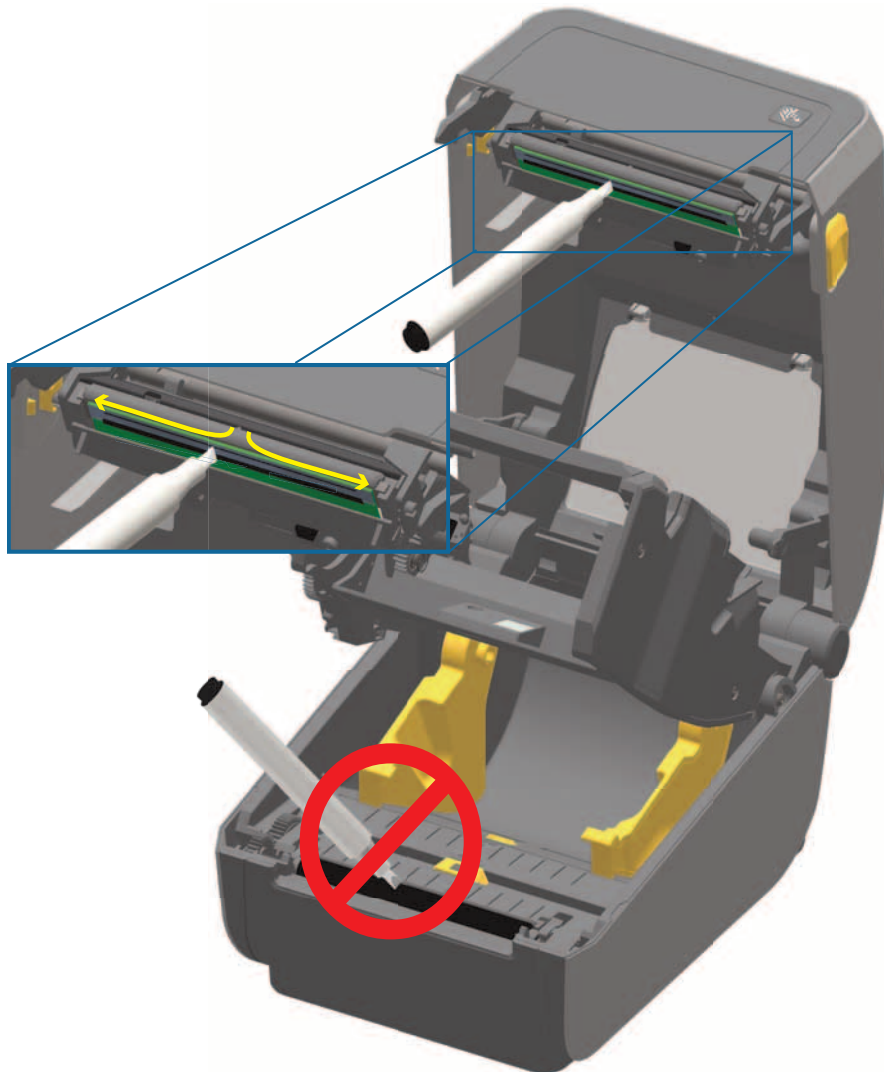
When you load new media or ribbon, you can also clean the printhead.

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.



ZD420 Ribbon Cartridge Printers

1. Pull the two (2) Release Arms out to release the Ribbon Drive Transport. See [Accessing the Printhead of the Ribbon Cartridge Printer](#) for more details.
2. Lift the Printhead Actuator Arm up to gain access to the printhead. 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 outer edges of media to the area outside of media path.
3. Wait one minute before closing the printer.



4. Release the Printhead Actuator Arm and then push the Ribbon Drive Transport into the Printhead Actuator Arm. The Release Arms will snap into place relinking the Ribbon Drive Transport to the top cover and the Printhead Actuator Arm.

Media Path Cleaning

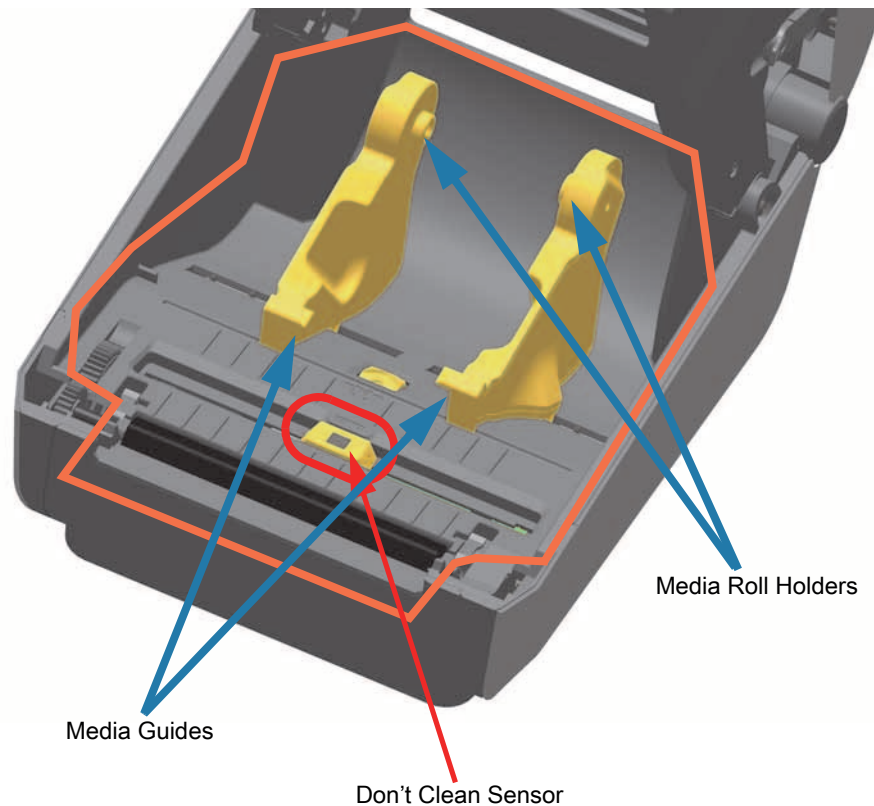
Use a cleaning swab and/or a lint free cloth to remove debris, dust or crust that has built-up on the holders, guides and media path surfaces. Lightly moisten the swab or cloth with 99% solution isopropyl alcohol. For hard to clean areas, use extra alcohol on a cleaning swab to soak the debris to break up any adhesive that may have accumulated on surfaces in the media compartment.

Do not clean the printhead, sensors, or platen as part of this process.

Lower Half of ZD60/ZD420 Printers

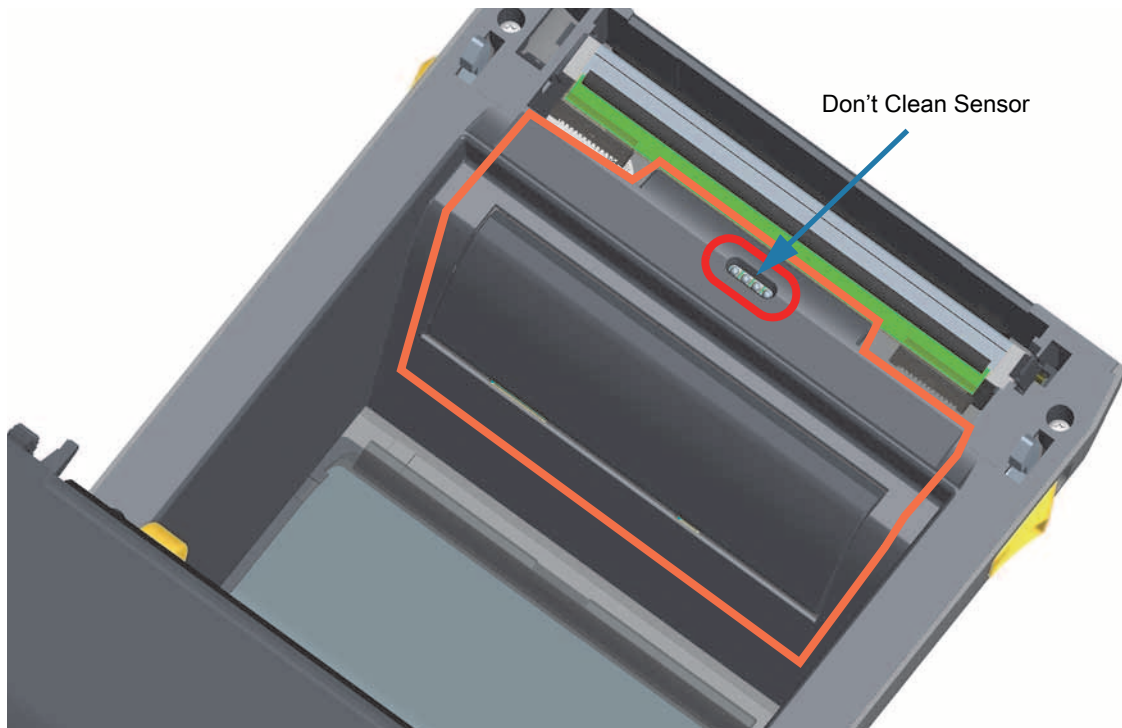
The lower half of these printers these printers get cleaned the same.

1. Wipe the inside surfaces of the roll holders and the underside of the media guides with a cleaning swabs and wipes.
2. Wipe the movable sensor slide channel (but not sensor). Move the sensor to get to all areas.
3. Wait one minute before closing the printer. Discard used cleaning supplies.



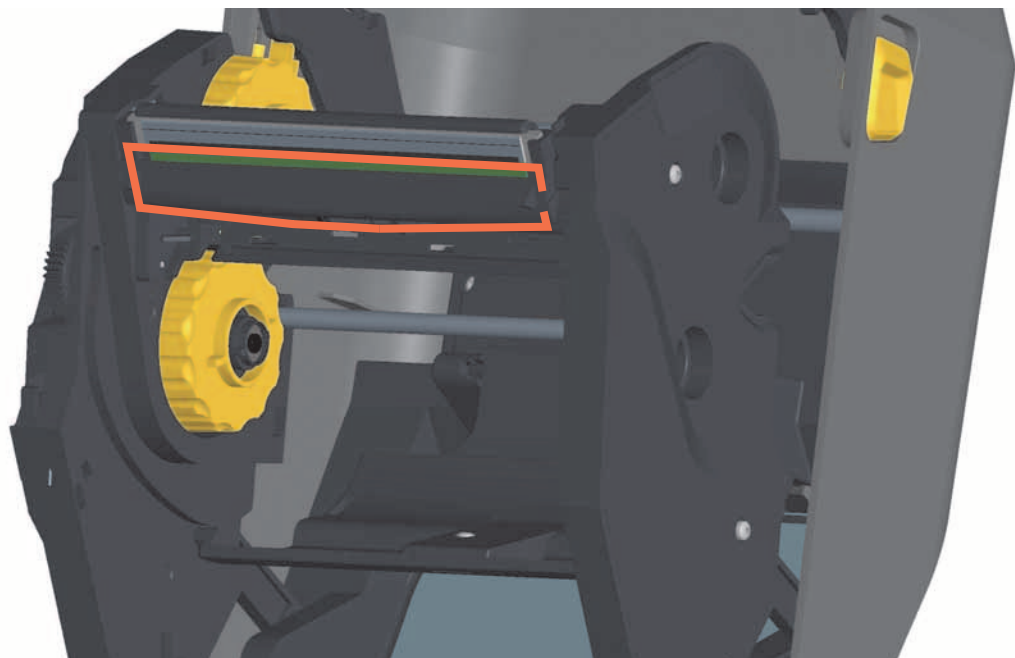
Upper Half of ZD620/ZD420 Direct Thermal Printers

1. Wipe the areas (outlined in orange) to remove adhesive and other contaminants. Do not clean the sensor array.



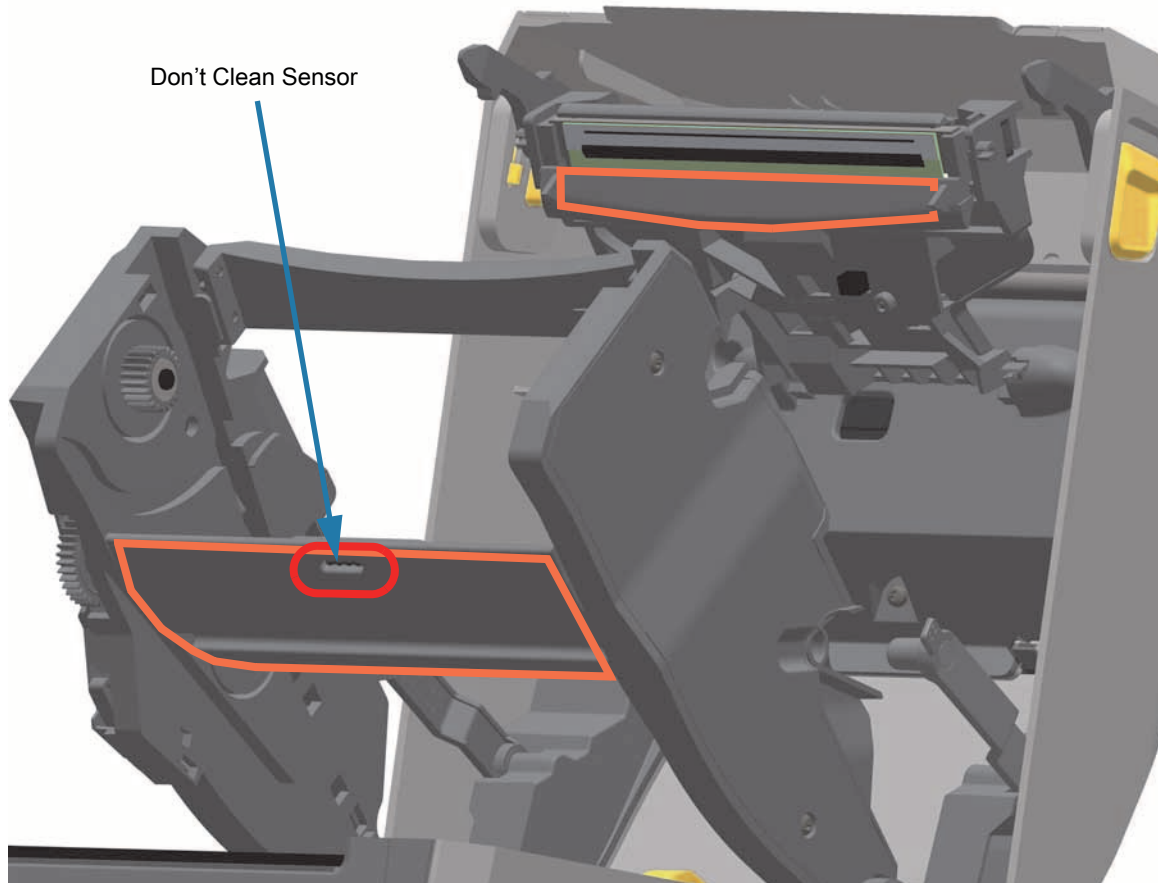
Upper Half of ZD620/420 Thermal Transfer Printers

1. Wipe the area (outlined in orange) near the printhead on the front of the ribbon carriage.



Upper Half of ZD420 Thermal Transfer Ribbon Cartridge Printers

1. Pull the two (2) Release Arms out to release the Ribbon Drive Transport. See [Accessing the Printhead of the Ribbon Cartridge Printer](#) for more details.
2. Wipe the areas (outlined in orange) below the Printhead Actuator Arm and the Ribbon Drive Transport.



3. Release the Printhead Actuator Arm and then push the Ribbon Drive Transport into the Printhead Actuator Arm. The Release Arms will snap into place relinking the Ribbon Drive Transport to the top cover and the Printhead Actuator Arm.

Cleaning the Cutter and Label Dispenser Options

This is a continuation of cleaning the media path for either option, if installed.

Cutter Option Cleaning

The plastic media path surfaces can be cleaned but not the internal cutter blades or mechanism.



Important • 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.

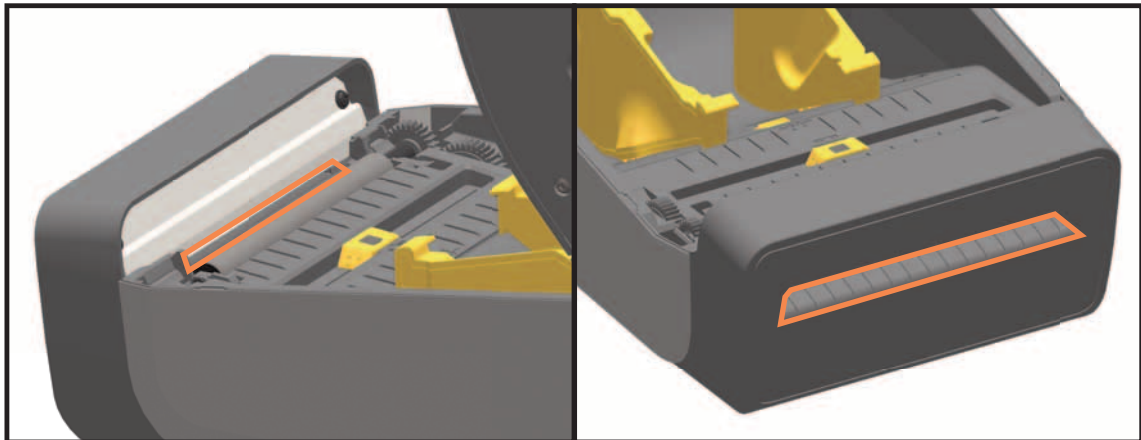


Cut Warning • There are no operator serviceable parts in the cutter unit. Never remove the cutter cover (bezel). Never attempt to insert objects or fingers in to the cutter mechanism.



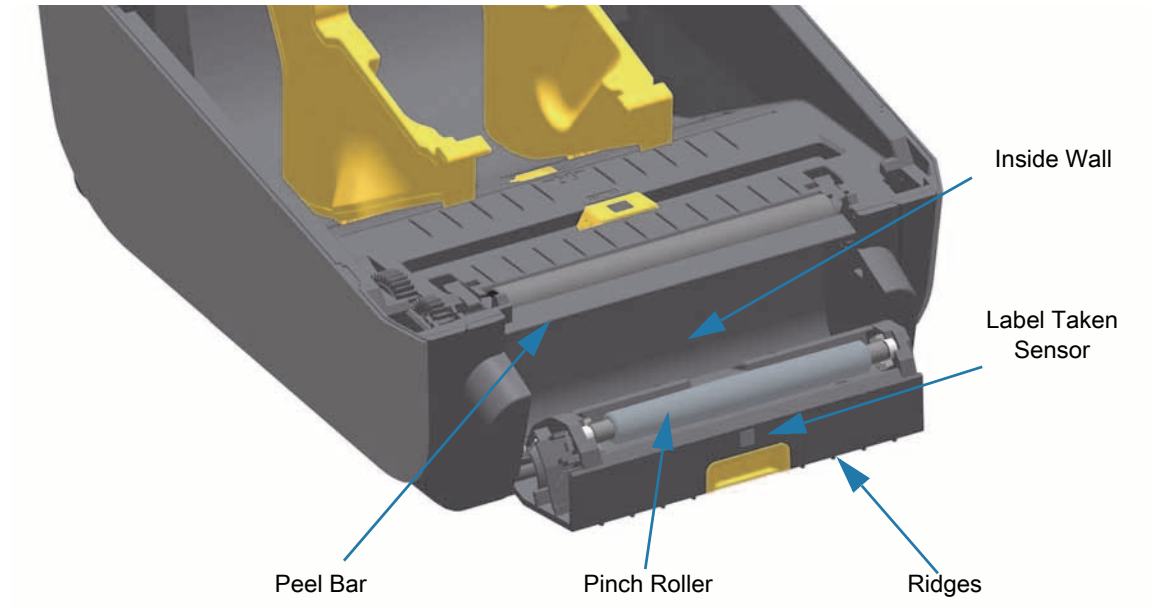
Note • Using un-approved tools, cotton swabs, solvents (including alcohol), etc. all may damage or shorten the cutter's usable life or cause the cutter to jam.

1. Wipe the ridges and the plastic surfaces of the media entry (inside) and exit slot (outside) of the cutter. Clean inside the areas outlined in blue.
2. Repeat as necessary to remove any adhesive or contaminate residue after it dries.



Label Dispenser Option Cleaning

1. Open the door and clean the peel bar, inner surfaces and ridges on the door.
2. Wipe the roller while rotating it. Discard the swab or cloth. Clean again to remove diluted residue.
3. Clean the sensor window. The window should be clear of streaks and residue.

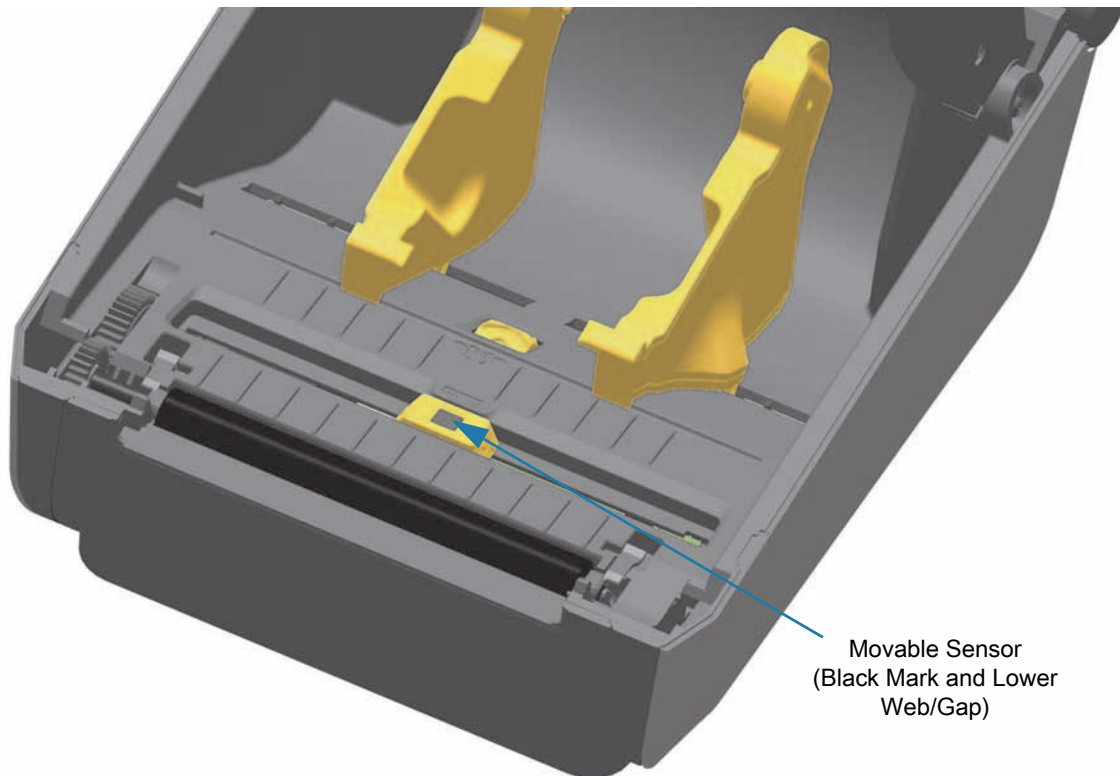


Sensor Cleaning

Dust can accumulate on the media sensors. Do not use an air compressor to remove dust. Compressors add moisture, fine grit, and lubricant which can contaminate your printer.

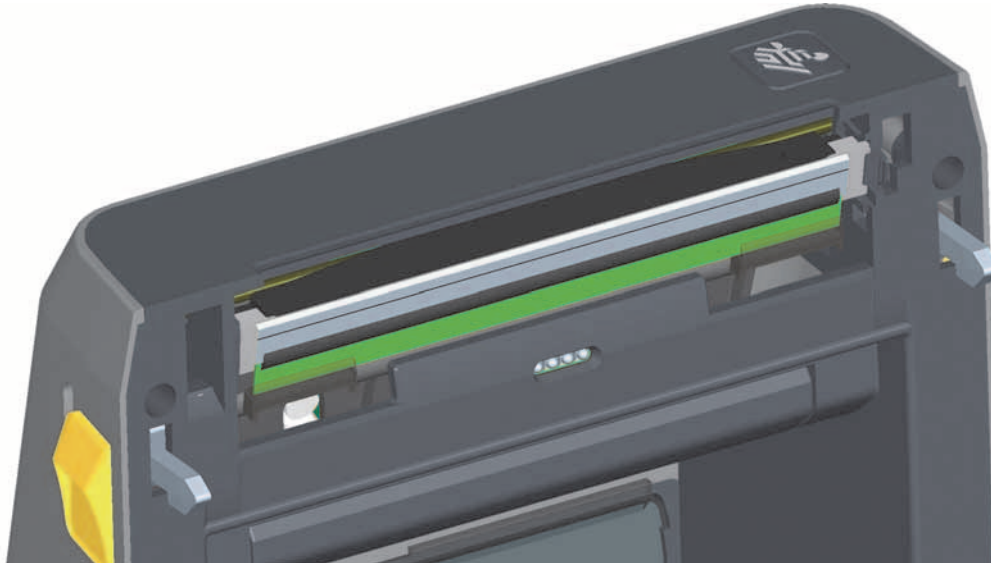
Lower Half of ZD60/ZD420 Printers

1. Clean the Movable Sensor's window. Gently brush away dust or use a can of compressed air; if necessary, use a dry swab to brush away dust. If adhesives or other contaminants remain, use an alcohol moistened swab to break it up.
2. Use a dry swab to remove any residue that may be left from the first cleaning.
3. Repeat steps 1 and 2 as required until all residue and streaks are removed from the sensor.



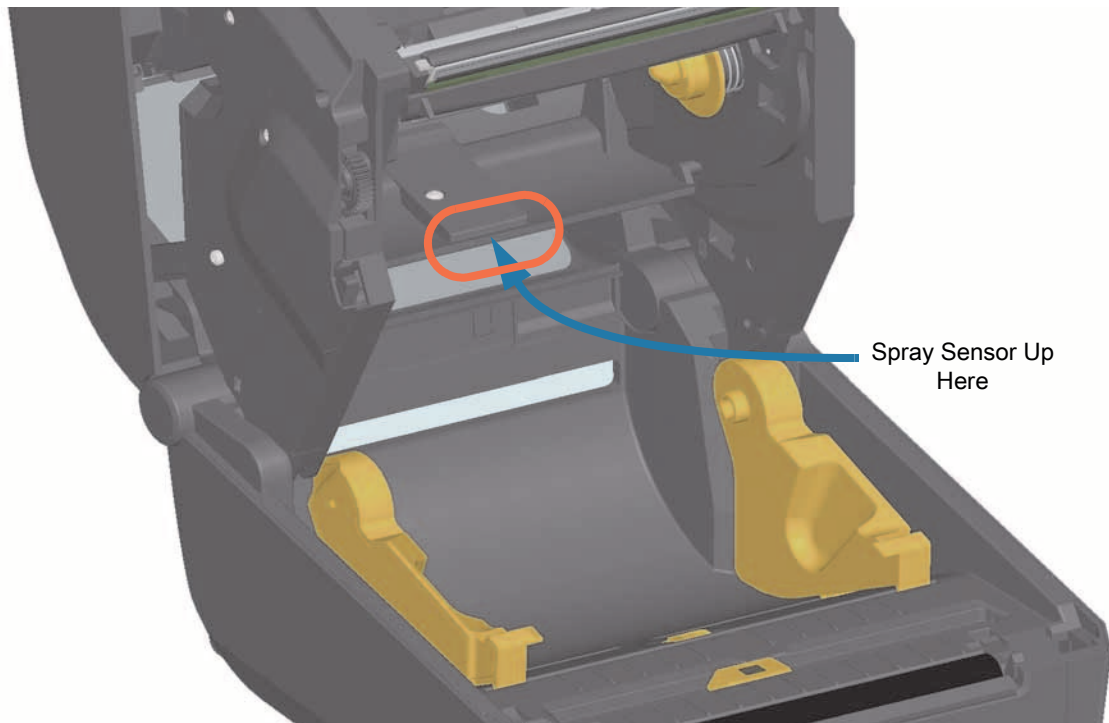
Upper Half of ZD620/ZD420 Direct Thermal Printers

1. Spray the Upper Web (Gap) Array Sensor below the printhead with a can of compressed air. If necessary, use an alcohol moistened swab to break up adhesive or other non-dust contaminants. Use a dry swab to remove any residue that may be left from the first cleaning.



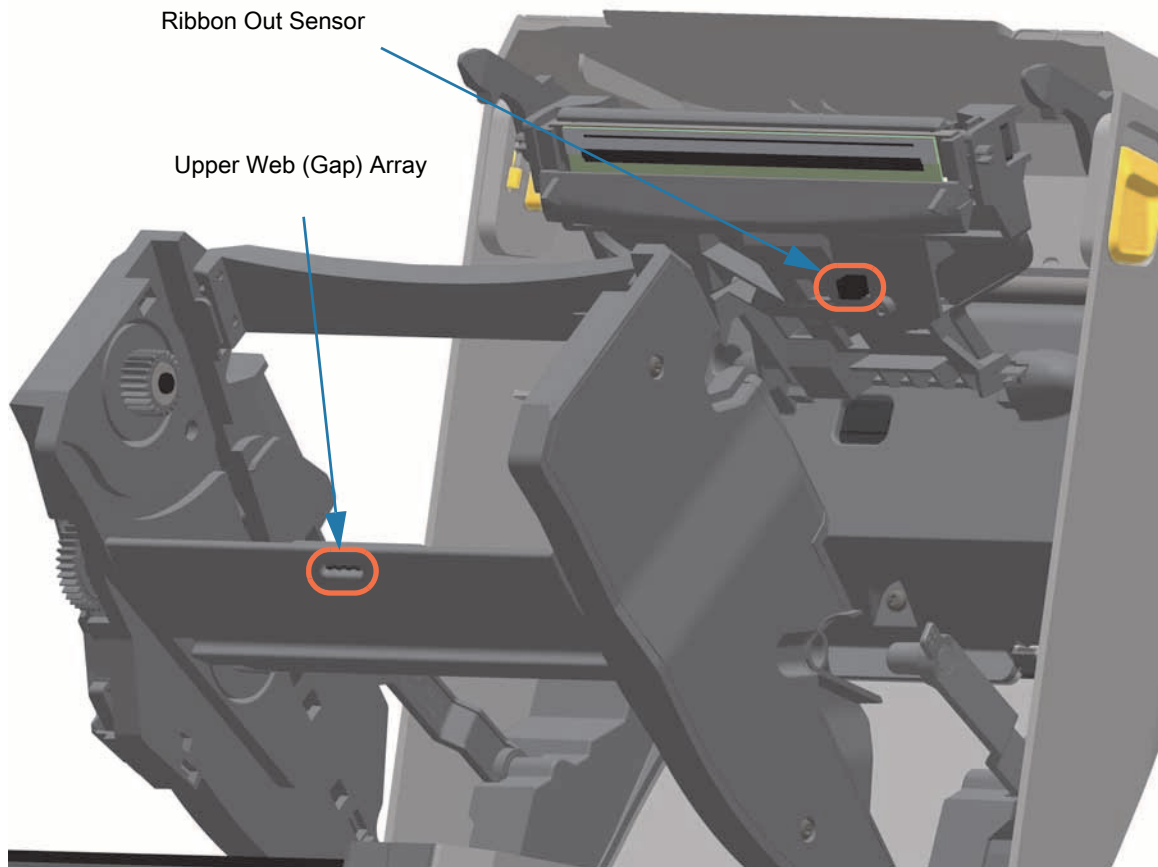
Upper Half of ZD620/ZD420 Thermal Transfer Printers

1. Spray the Upper Web (Gap) Array Sensor below the printhead with a can of compressed air. Complete sensor cleaning (very rare) requires a service technician



Upper Half of ZD420 Ribbon Cartridge Printers

1. Pull the two (2) Release Arms out to release the Ribbon Drive Transport. See [Accessing the Printhead of the Ribbon Cartridge Printer](#) for more details.
2. 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 area below the printhead, see the next graphic.
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 it up. Use a dry swab to remove any residue that may be left from the first cleaning.



Cleaning Ribbon Cartridge Sensor

1. **Ribbon Cartridge Sensor Pins - Only clean when the cartridges are failing detection.** Clean the Ribbon Cartridge interface pins with a gentle wiping from right to left. Up and down motions may damage the pins.



Platen Cleaning and Replacement

The platen (drive roller) normally does not require cleaning. Normally, paper and liner dust can accumulate without affecting print operations.

Clean the platen (and media path) whenever the printer has significantly poorer performance, print quality or media handling. The platen is the print surface and drive roller for your media. If sticking or jamming continues even after cleaning, you must replace the platen.



Important • Contaminants on the platen roller can damage the printhead or cause the media to slip or stick when printing. Adhesive, dirt, general dust, oils and other contaminants should be cleaned immediately off the platen.

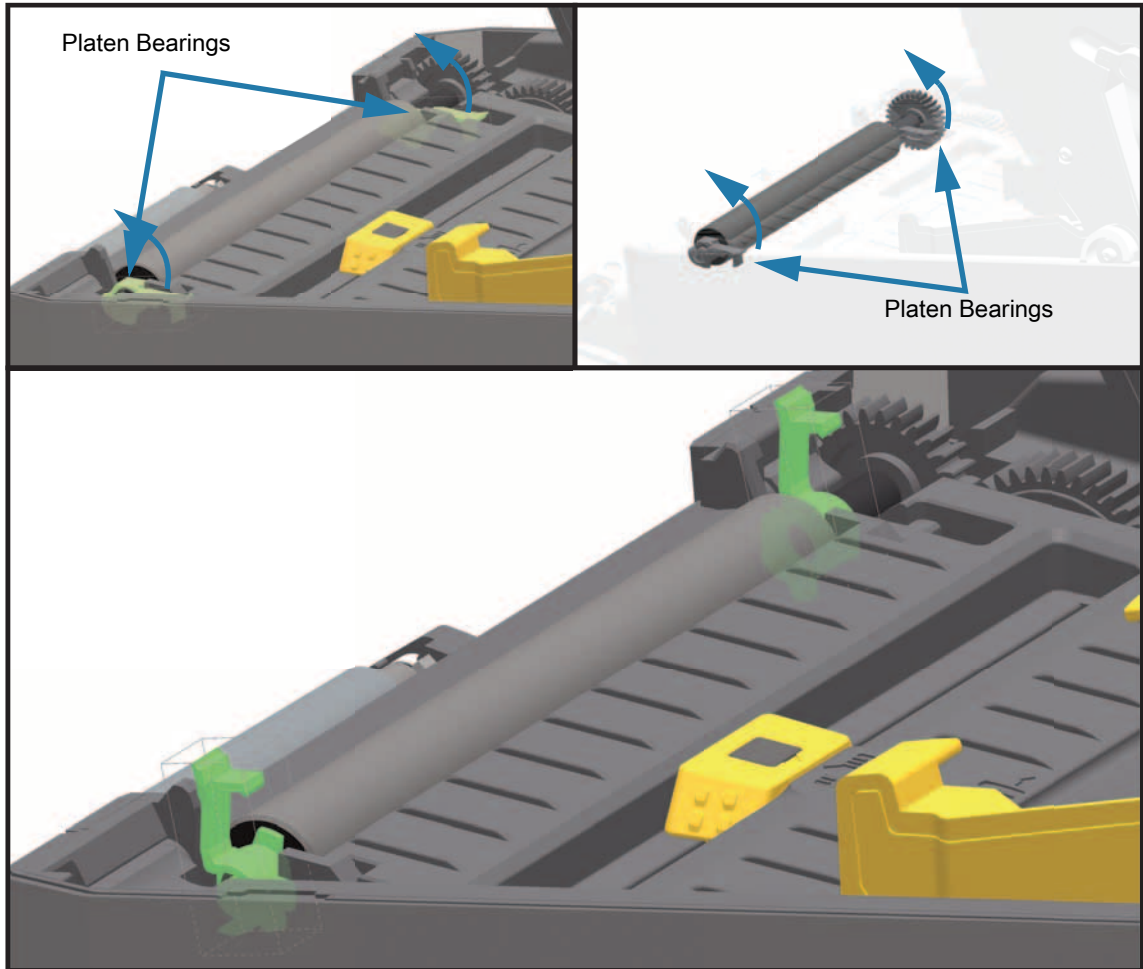


Important • LINERLESS PLATENS — Do not wash or scrub. Only remove adhesive particles by using the adhesive side of linerless media. Lightly touch the platen roller with a linerless label to lift particles off the exposed area of the platen roller and the media path areas.

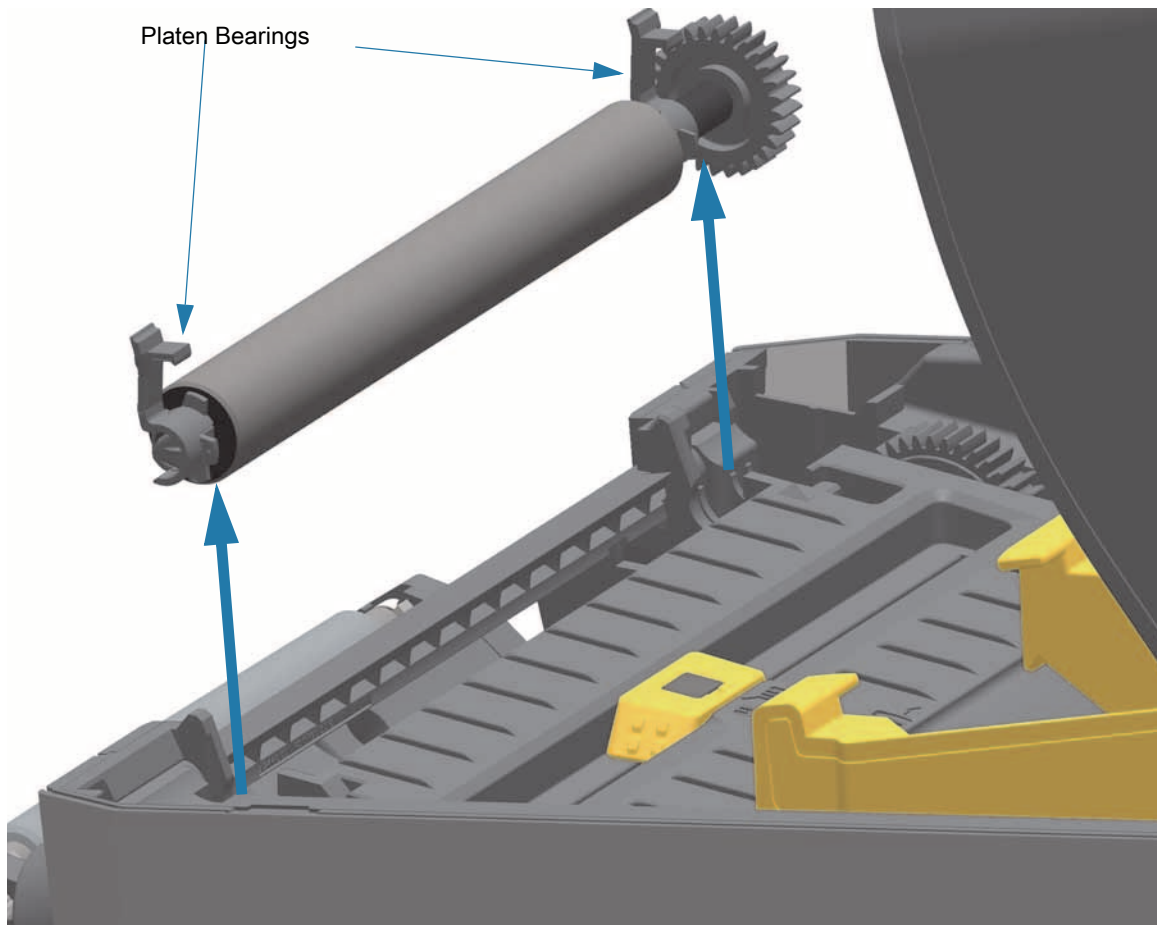
Removing the Platen Roller

The platen can be cleaned with a fiber-free swab (such as a Texpad swab) or a lint free, clean, damp cloth very lightly moistened with medical grade alcohol (90% pure or better).

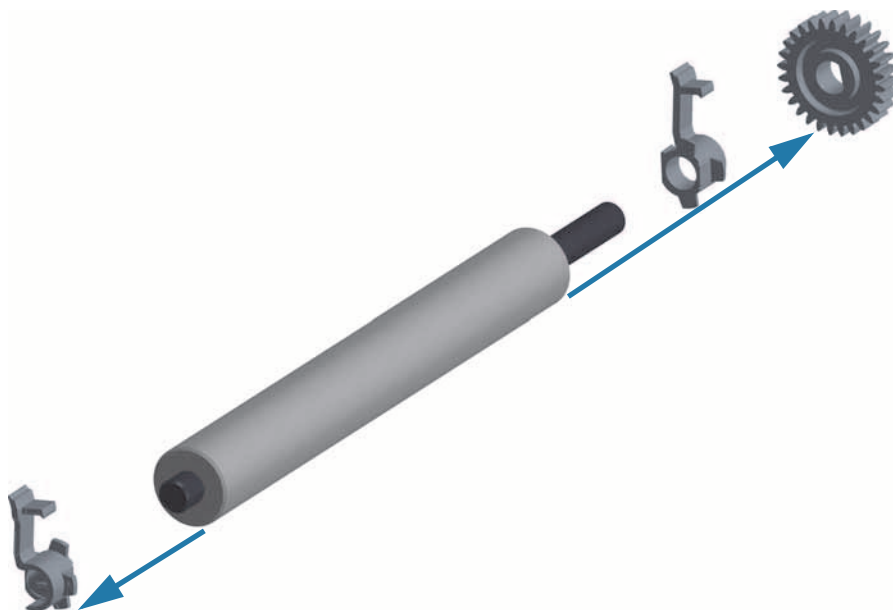
1. Open the cover (and dispenser door, if the dispenser is installed). Remove media from platen area.
2. Pull the platen bearing latch release tabs on the right and left sides towards the front of the printer and rotate them up.



3. Lift the platen out of the printer's bottom frame.



4. Slide the gear and the two (2) bearings off the shaft of the platen roller.

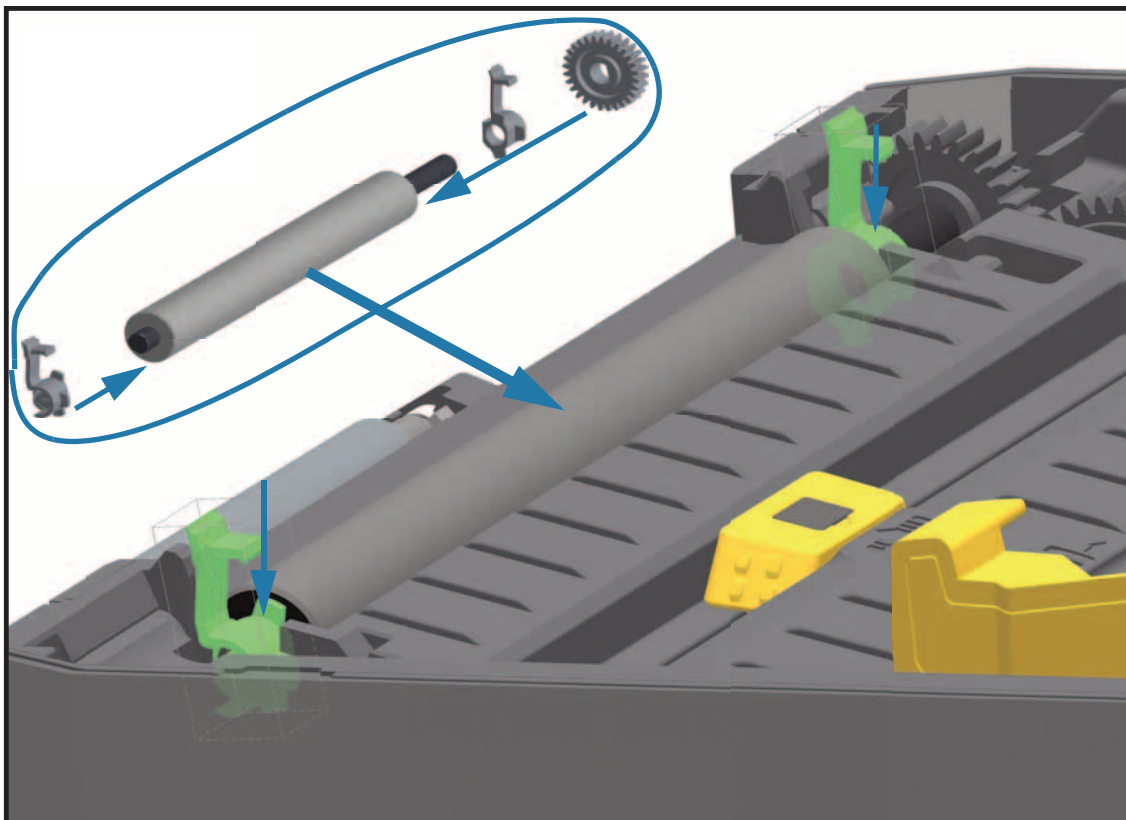


- 5. Cleaning Only** — Clean the platen with the alcohol moistened swab. Clean from the center out. Repeat this process until all of the roller surface has been cleaned. If there has been heavy adhesive build-up or label jam, repeat with a new swab to remove residual contaminants. Adhesives and oils, for example, may be thinned by the initial cleaning but not completely removed.



Important • LINERLESS PLATENS — Only use the adhesive side of a piece of linerless media to gently lift the particles from the platen roller for cleaning.

- 6.** Discard the cleaning swabs after use - do not reuse.
- 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

If you need to replace the printhead, read the procedure and review the removal and installation steps before actually replacing the printhead.



ESD 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.

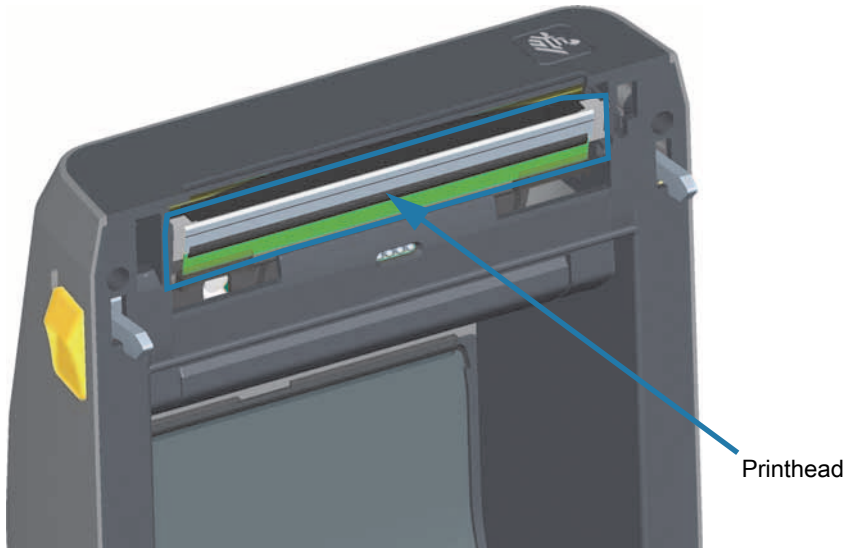
Use one of the following model specific procedures to replace the printhead.

- [ZD620 and ZD420 Direct Thermal](#)
- [ZD620 and ZD420 Thermal Transfer Ribbon Roll](#)
- [ZD420 Thermal Transfer Ribbon Cartridge](#)

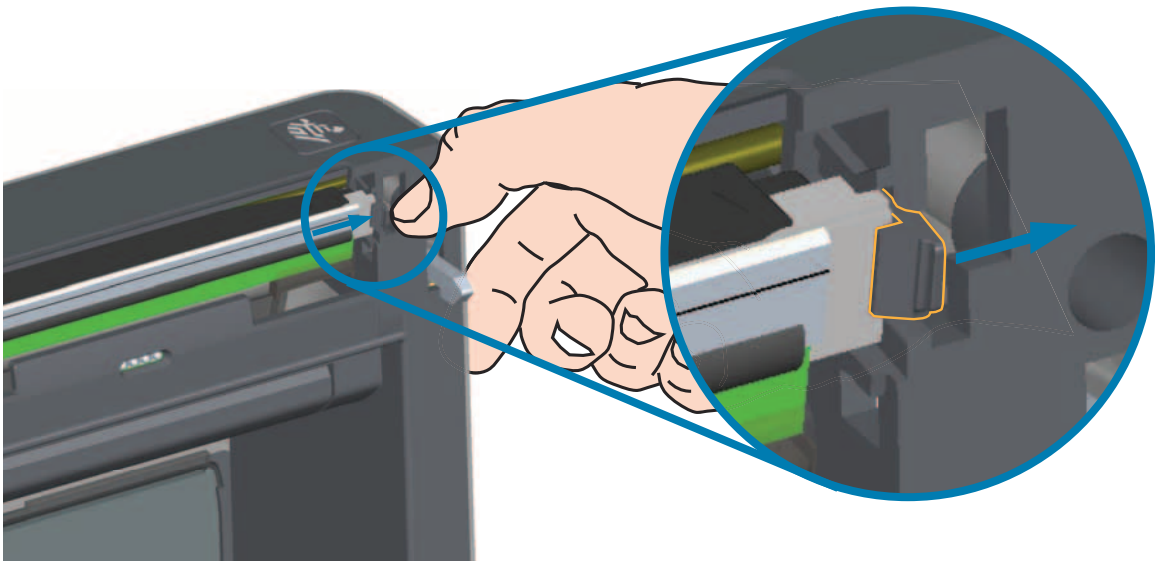
ZD620 and ZD420 Direct Thermal

Removing the Printhead

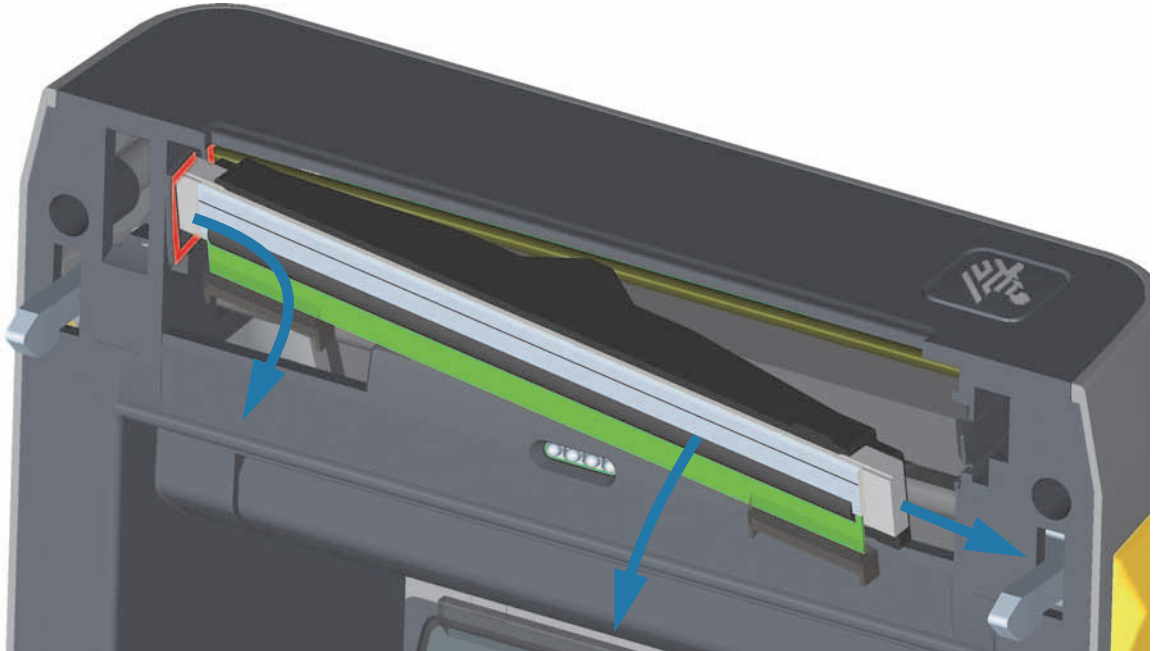
1. Turn the printer OFF. Open the printer.



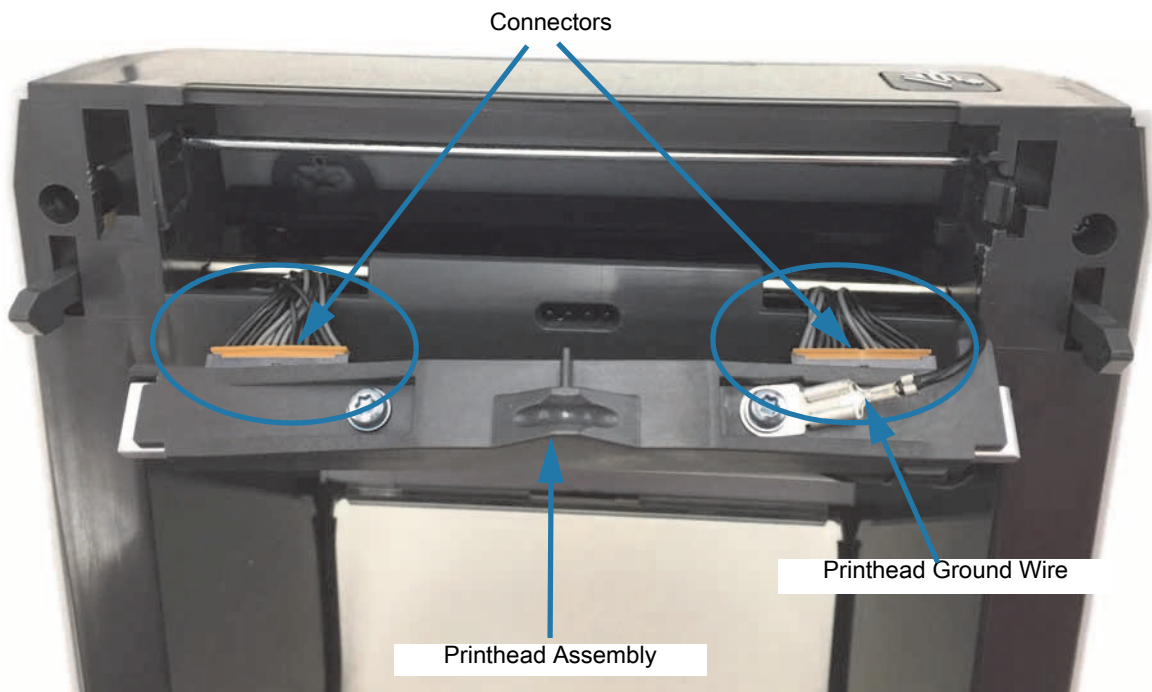
2. Push the printhead release latch away from the printhead. The right side of printhead releases.



3. 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. Pull the printhead out and free of the top cover to gain access to its attached cables on the backside of the printhead. Note, the red highlights the left side printhead retainer slot.

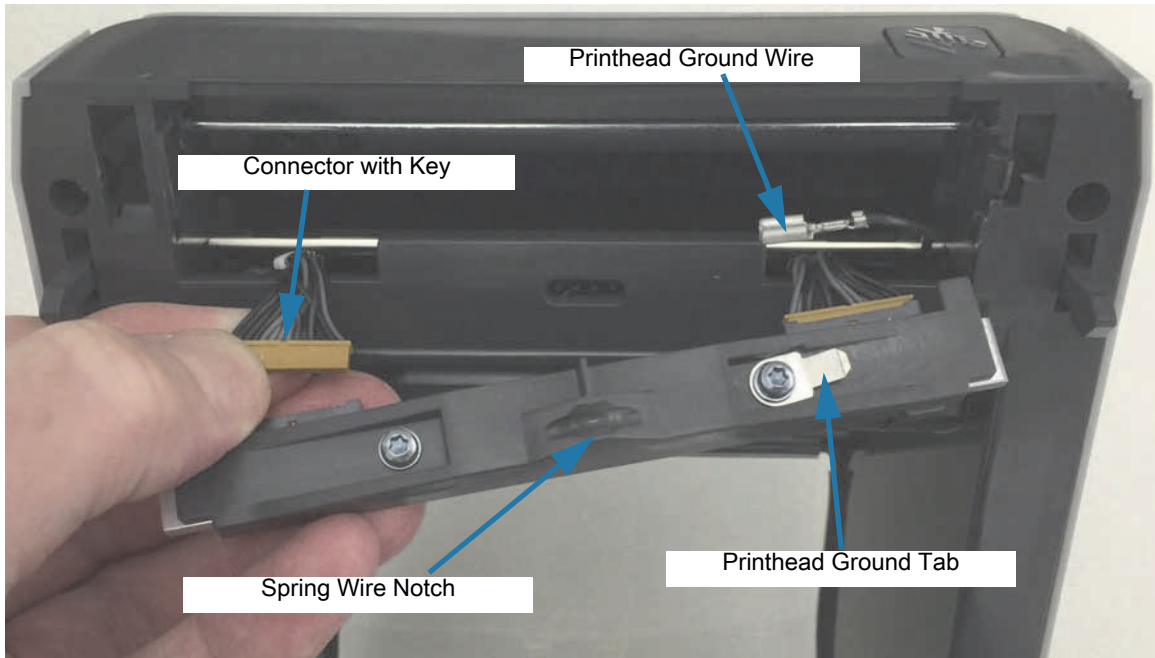


4. Gently but firmly pull the two printhead cable bundle connectors off of the printhead. Pull the ground wire off the printhead.

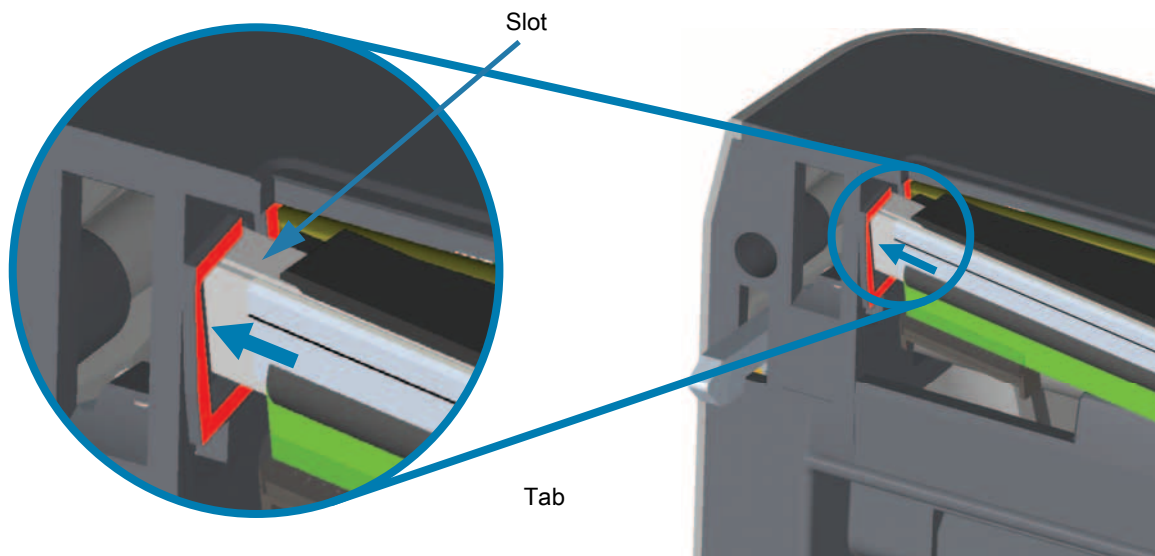


Replacing the Printhead

1. Push the right side printhead cable connector into the printhead. The connector is keyed to only insert one way.
2. Attach the ground wire to the printhead's ground tab.
3. Push the left side printhead cable connector onto the printhead.

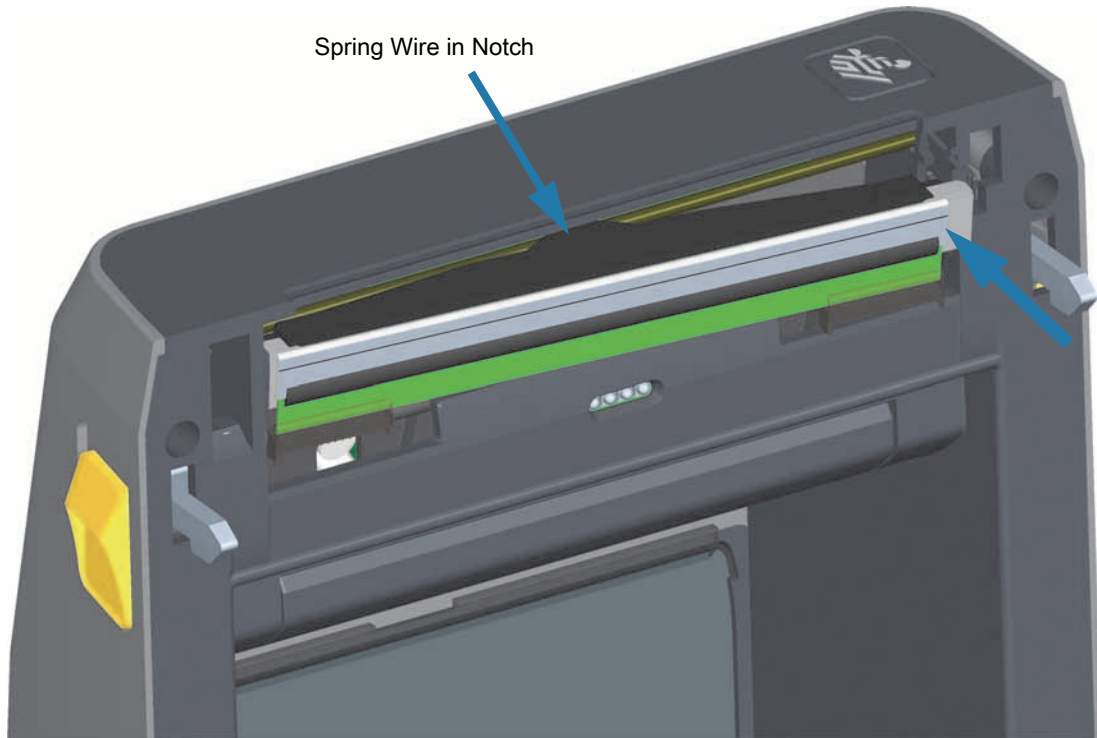


4. Insert the left side of the printhead assembly into the recessed slot (highlighted in red) on the left side of the printer.

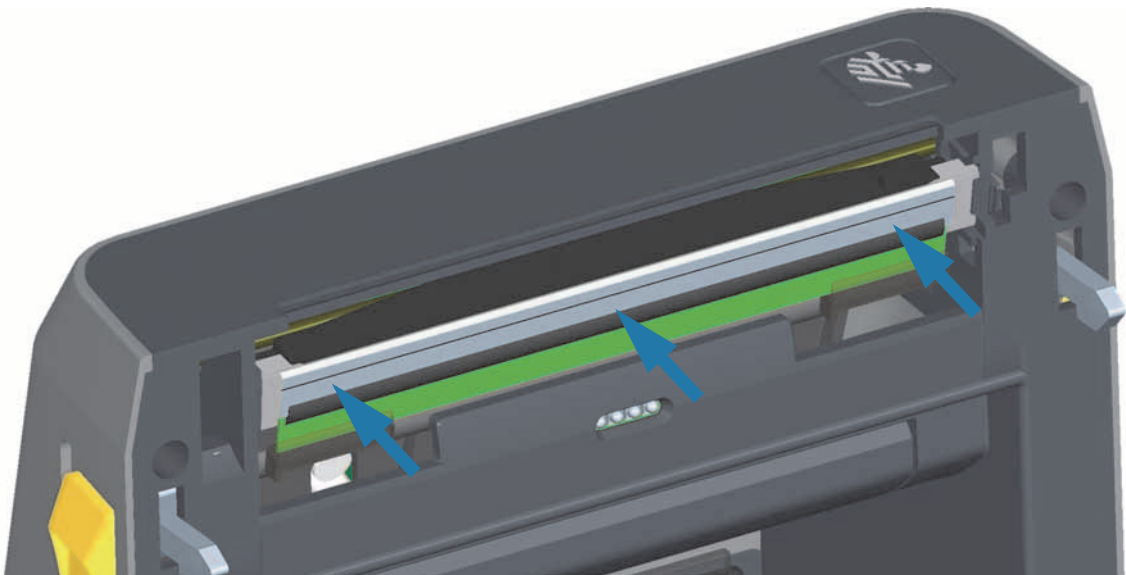


Maintenance

5. 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.



6. Verify that the printhead moves up and down freely when pressure is applied and remains locked when released.

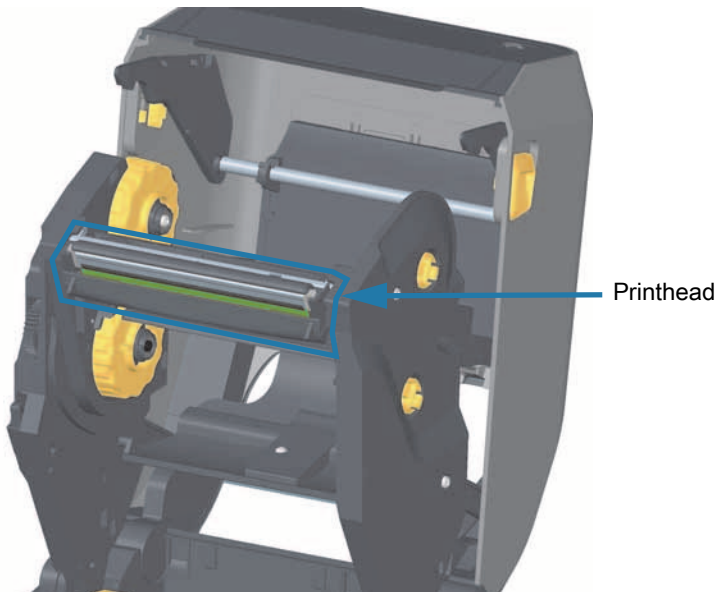


7. Clean the printhead. Use a new pen to wipe body oils (finger prints) and debris of the printhead. Clean from the center of the printhead to the outside. See [Cleaning the Printhead](#).
8. Reload media. Plug in the power cord, turn on the printer and print a status report to ensure proper function. See [Test Printing with the Configuration Report](#).

ZD620 and ZD420 Thermal Transfer Ribbon Roll

Removing the Printhead

1. Turn the printer OFF. Open the printer.

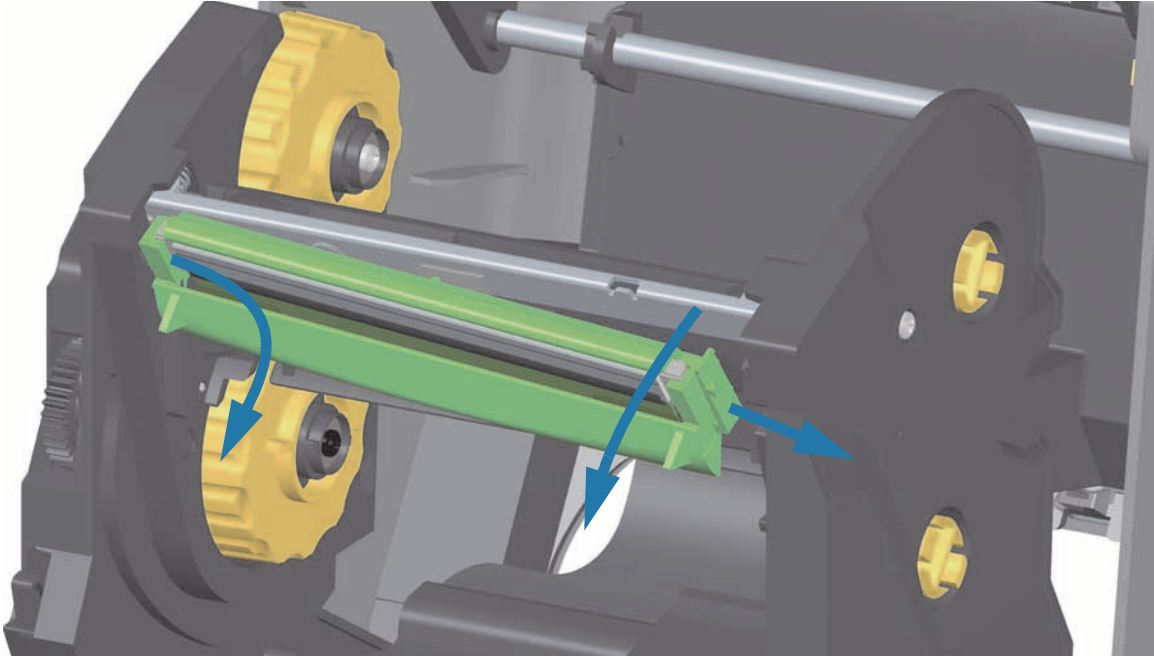


2. Push the printhead release latch toward the printhead (shown as green for visibility). The right side printhead releases down and away from the Printhead Actuator Arm.

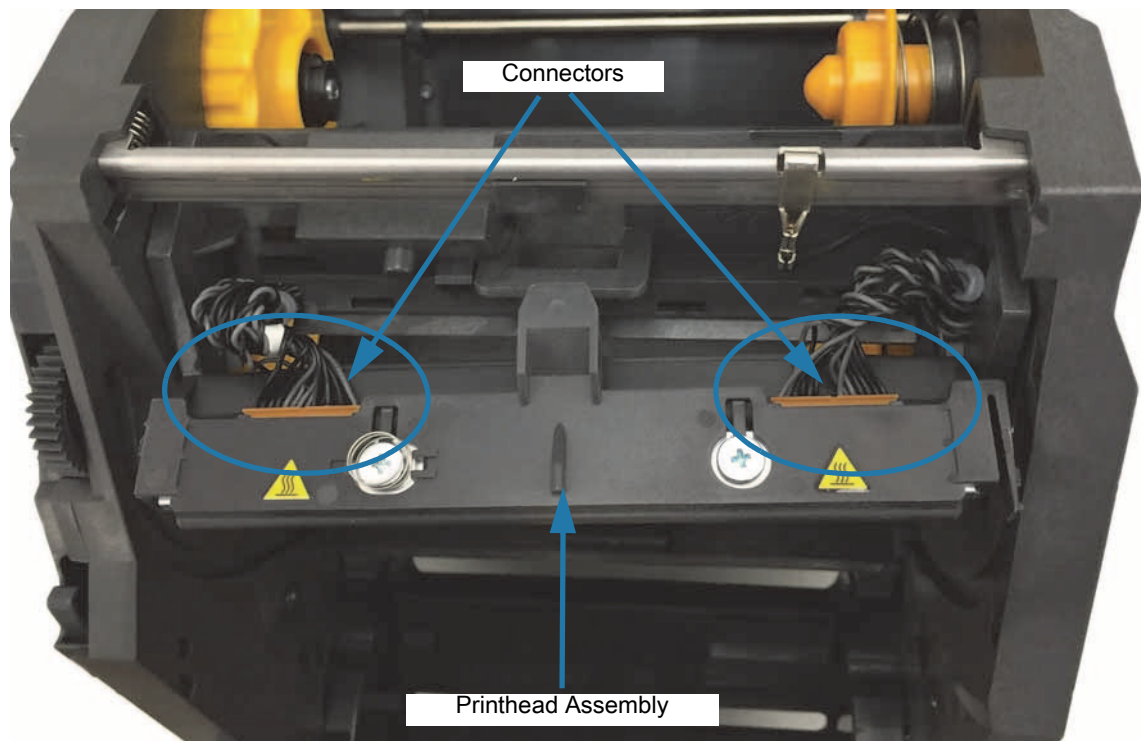


Maintenance

3. 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.



4. Gently but firmly pull the two printhead cable bundle connectors off of the printhead.

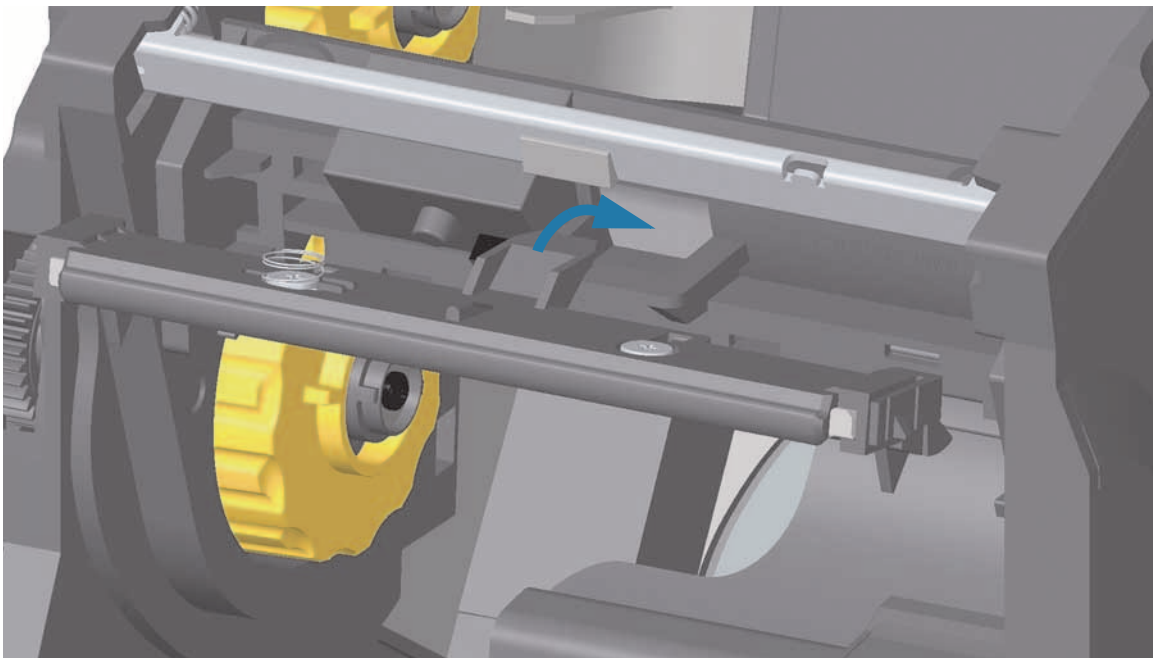


Replacing the Printhead

1. Push the right side printhead cable connector into the printhead. The connector is keyed to only insert one way.
2. Push the left side printhead cable connector onto the printhead.

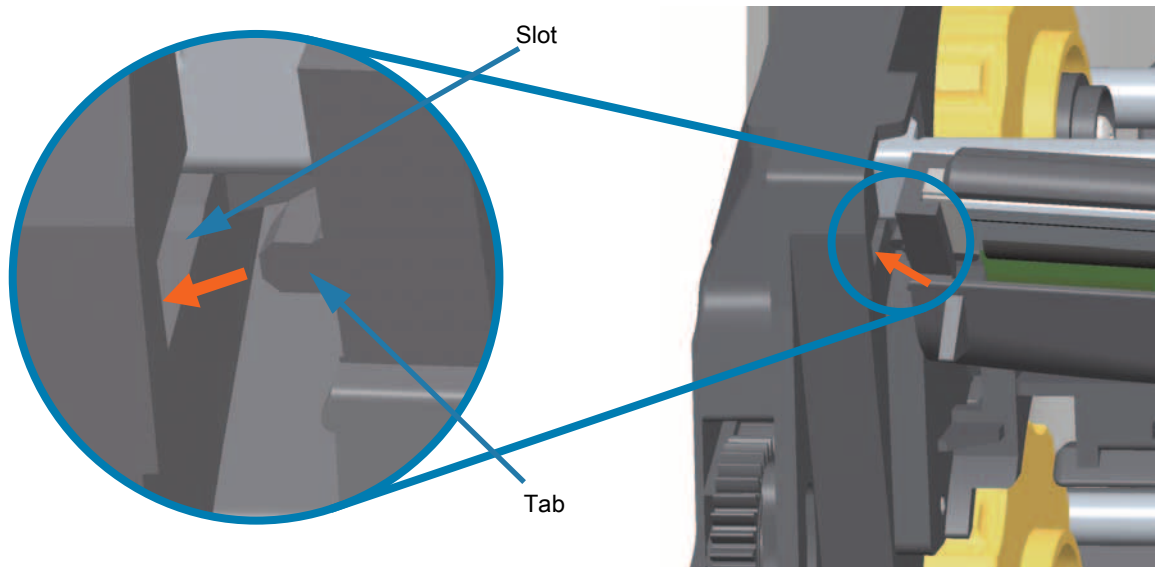


3. Insert the center tab on the printhead assembly into the center slot on the Printhead Actuator Arm.

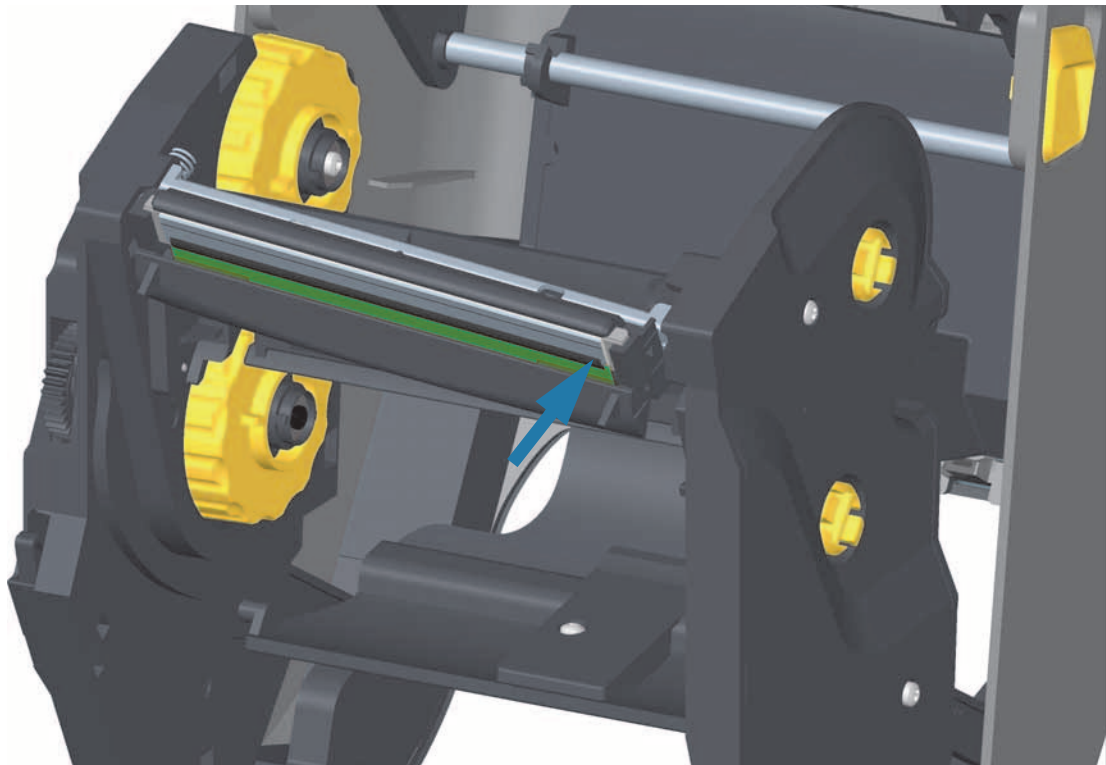


Maintenance

4. Insert the left side tab of the printhead assembly into the recessed slot on the left side of the Printhead Actuator Arm.

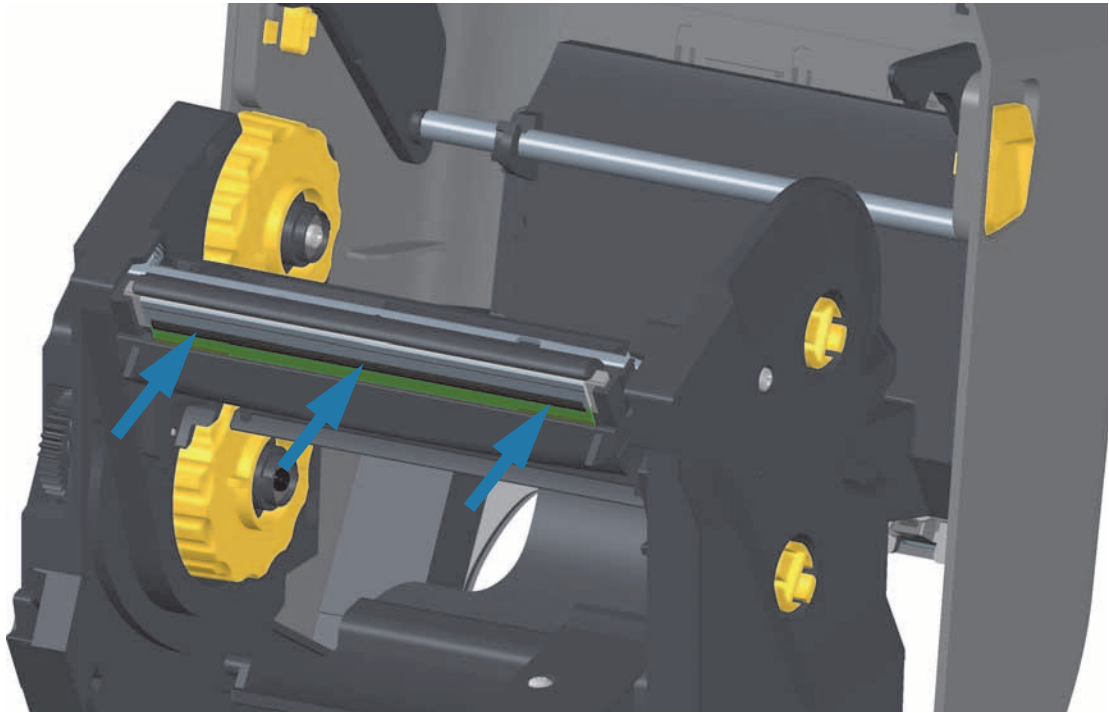


5. Push the right side of the printhead into the printer until the latch locks the right side of the printhead into the printer.



Maintenance

6. Verify that the printhead moves up and down freely when pressure is applied and remains locked when released.

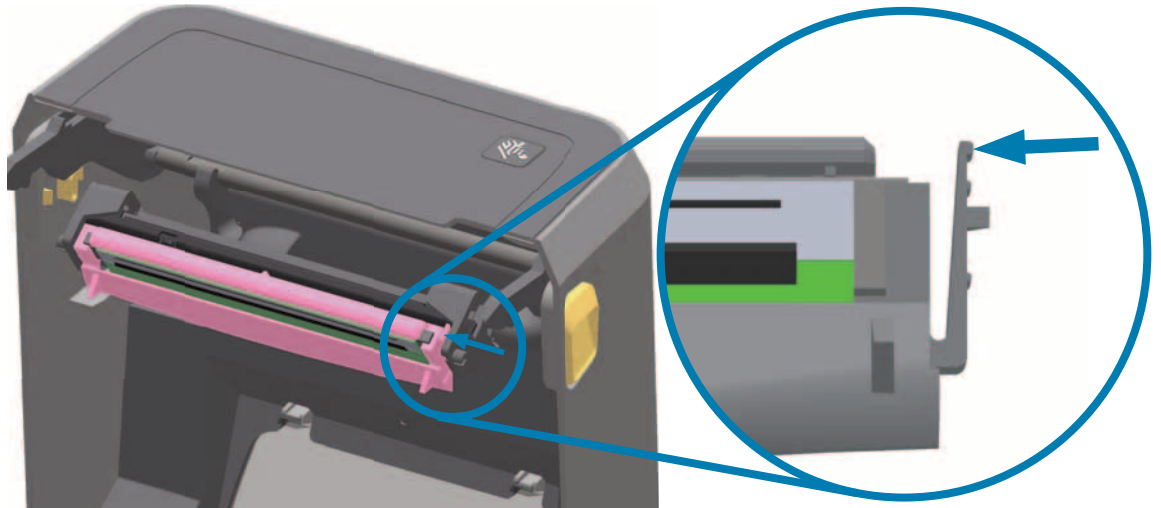


7. Clean the printhead. Use a new pen to wipe body oils (finger prints) and debris of the printhead. Clean from the center of the printhead to the outside. See [Cleaning the Printhead](#).
8. Reload media. Plug in the power cord, turn on the printer and print a status report to ensure proper function. See [Test Printing with the Configuration Report](#).

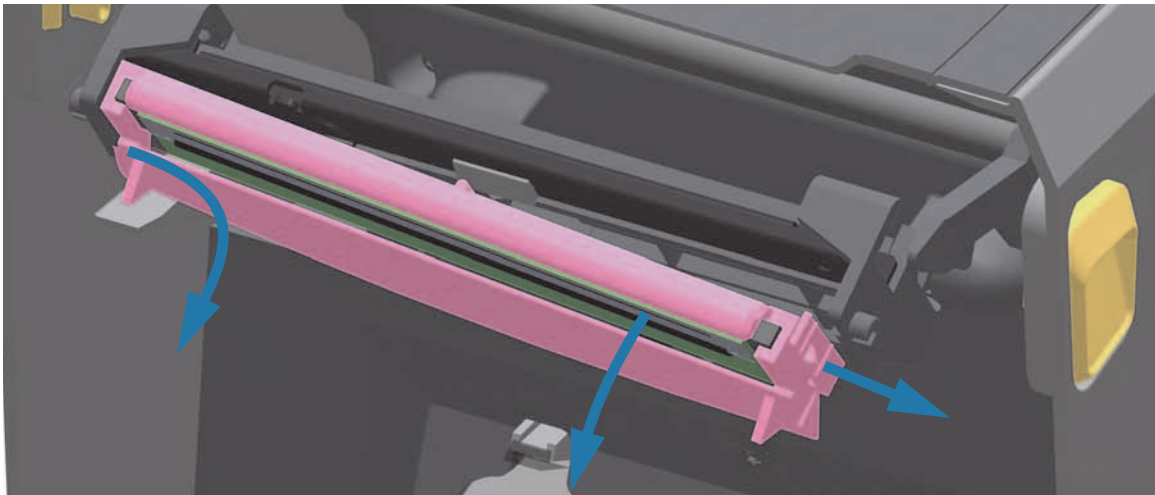
ZD420 Thermal Transfer Ribbon Cartridge

Printhead Removal

1. Turn the printer OFF. Open the printer.
2. Pull the two (2) Release Arms out to release the Ribbon Drive Transport. See [Accessing the Printhead of the Ribbon Cartridge Printer](#) for more details.
3. 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). The right side printhead releases down and away from the Printhead Actuator Arm.

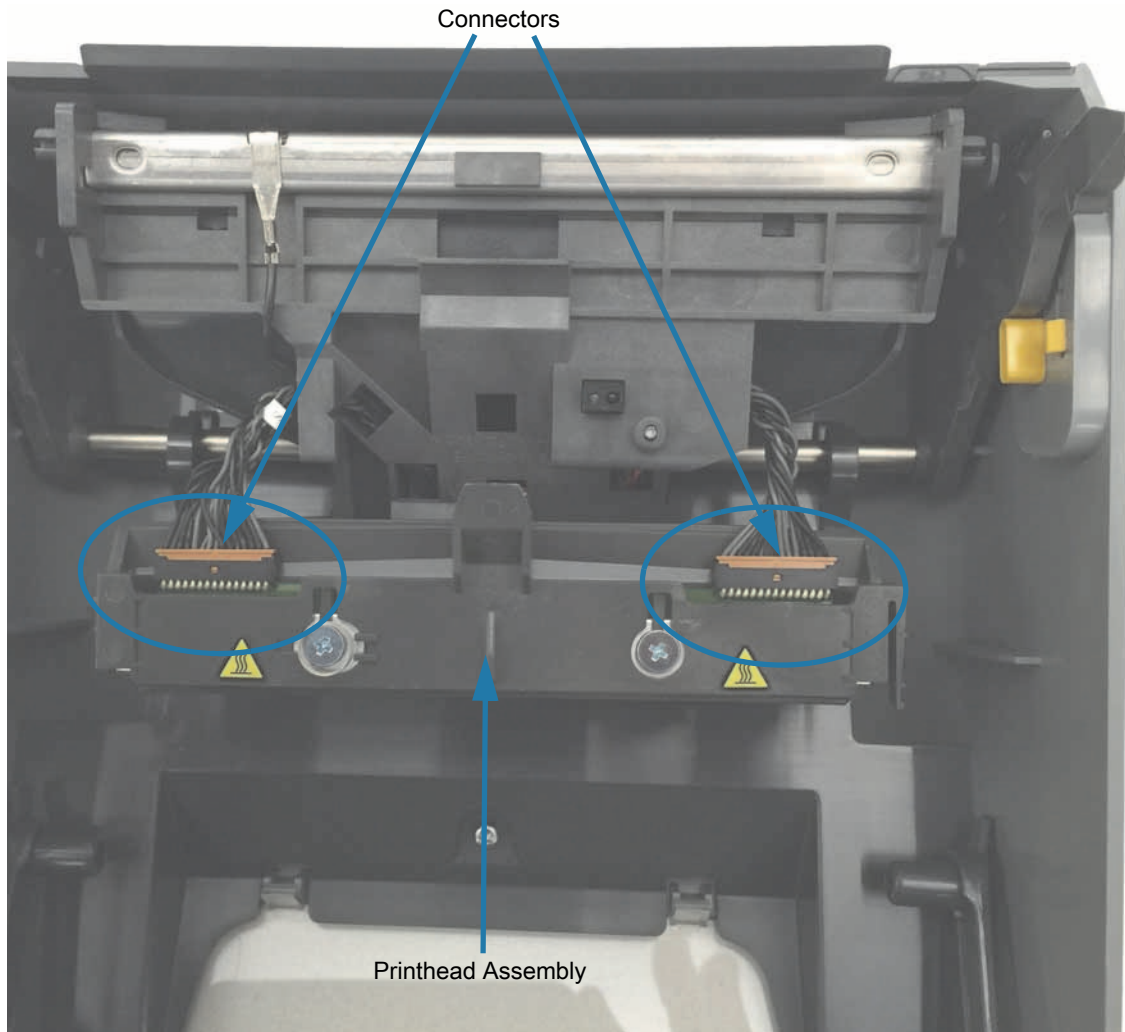


4. Swing the loose right side of the printhead out of the printer. Pull it to the right a little to get the left side of the printhead clear. Pull the printhead down and free of the Printhead Actuator Arm to gain access to its attached cables.



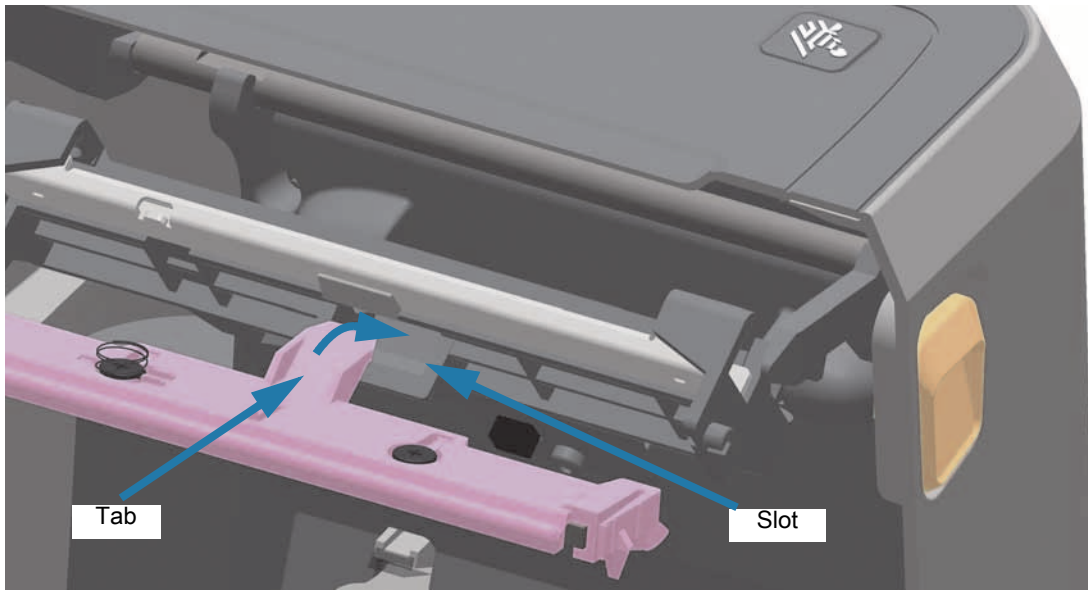
Maintenance

5. Gently but firmly pull the two printhead cable bundle connectors off of the printhead.

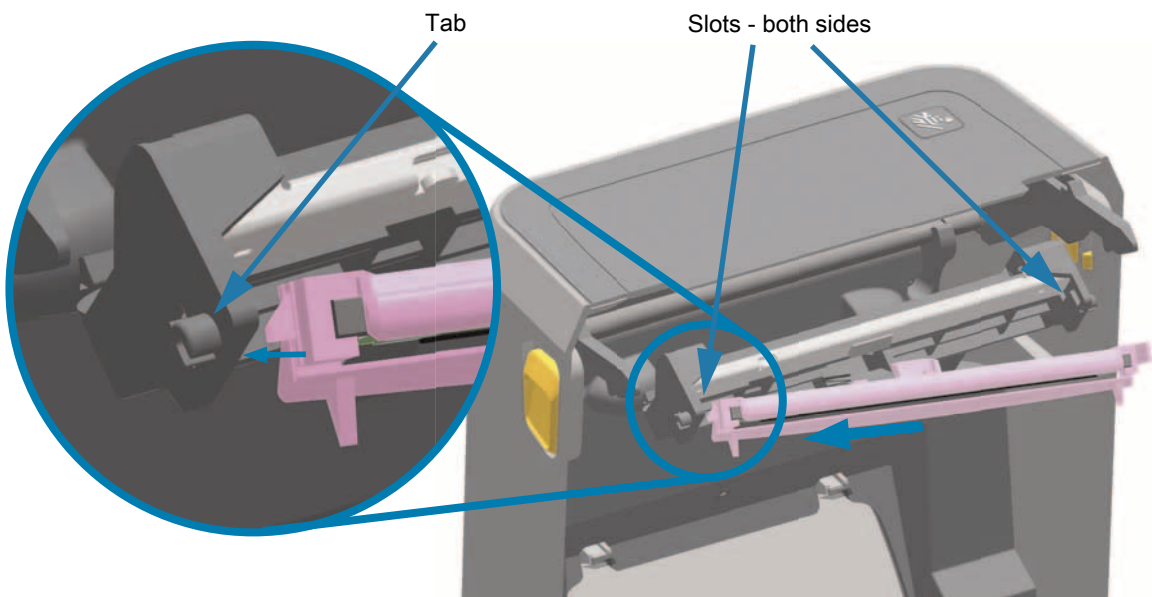


Replacing the Printhead

1. Push the right side printhead cable connector into the printhead. The connector is keyed to only insert one way.
2. Push the left side printhead cable connector onto the printhead.
3. Insert the center tab on the printhead assembly into the center slot on the Printhead Actuator Arm.

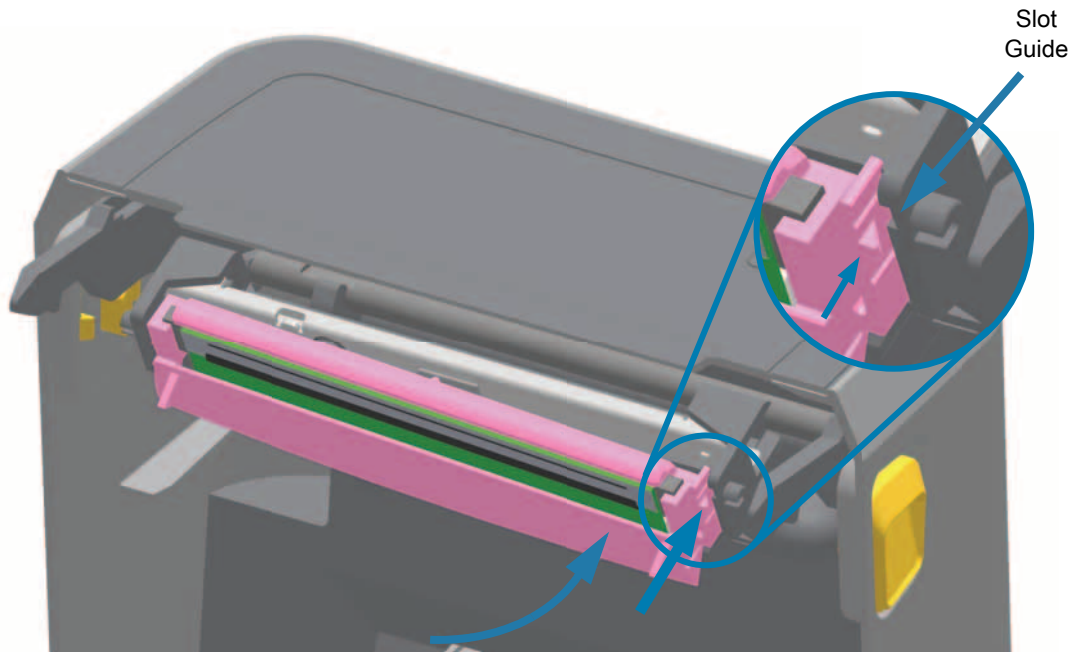


4. Insert the left side tab of the printhead assembly into the recessed slot on the left side of the Printhead Actuator Arm.

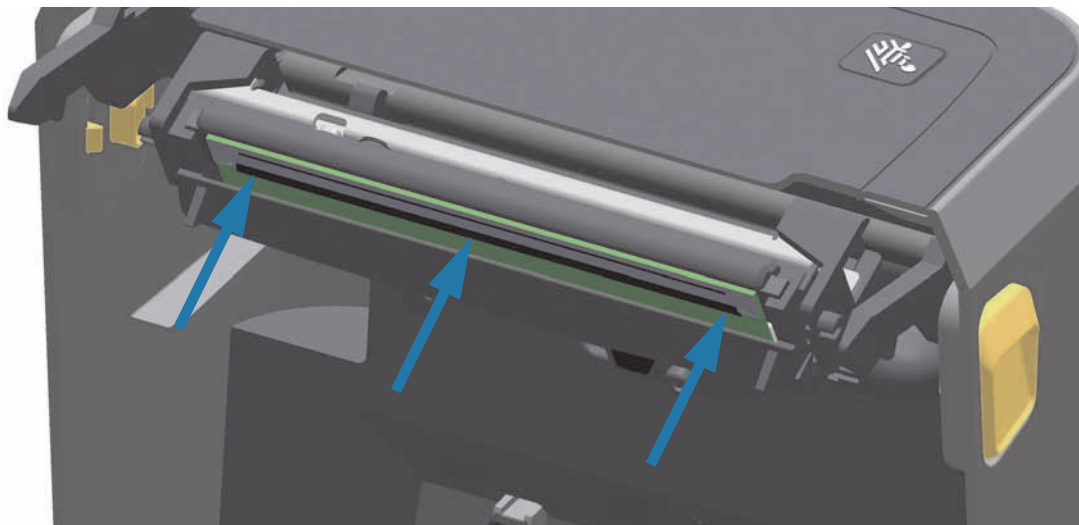


Maintenance

5. Push the right side of the printhead into the printer until the latch locks the right side of the printhead into the printer.



6. Verify that the printhead moves freely into the printer when pressure is applied (see arrow) and remains locked when pressure is released.



7. Clean the printhead by using a new cleaning pen to wipe body oils (finger prints) and debris off the printhead. See [Cleaning the Printhead](#).
8. Reload media. Turn on the printer and print a status report to ensure proper function. See [Test Printing with the Configuration Report](#).

Updating Printer Firmware

The printer's firmware may need to be updated periodically to get new features, improvements, and printer upgrades for media handling and communications.

Use Zebra Setup Utilities (ZSU) to load new firmware.

1. Open Zebra Setup Utilities.
2. Select your installed ZD620/ZD420 printer.
3. Click on the 'Open Printer Tools' button and a 'Tools' window will open.
4. Click on the 'Action' tab.
5. Load the printer with media. See [Loading Roll Media](#).
6. Click on the text line - 'Send file'. The lower half of the window will present a filename and path with a Browse (...) button to select the latest firmware file you have downloaded from the Zebra Web site.
7. Observe the user interface and wait.
If the firmware version is different than the version installed on the printer, the firmware will download to the printer. The data indicator will flash green while the firmware is downloading. The printer will restart with all indicators flashing. When the firmware update has completed, the STATUS indicator will display solid Green as the firmware is validated and installed. A printer Configuration Report is automatically printed and the firmware update has been completed.

Other Printer Maintenance

There are no user level maintenance procedures beyond those detailed in this section. See the [Troubleshooting](#) for more information on diagnosing printer and print problems.

RTC Battery

The Real Time Clock (RTC) is included with your printer.

The clock's battery is rated to provide approximately ten (10) years of service and is not user replaceable. See a Zebra authorized service technician to replace the battery. See the warranty for your printer for more details at the Zebra Web site:

www.zebra.com/warranty



Caution • The printer has a three volt lithium battery. You can discern a low or flat battery if the printer provides a consistently delayed date stamp. Battery replacement must be performed by a qualified service technician. Only use a Zebra approved replacement battery.



Important • Recycle batteries according to local your guidelines and regulations. Wrap the battery when disposing (or storing) to avoid a short circuit.



Caution • DO NOT short circuit the battery. Short circuiting the battery may result in heat generation, fire or bursting.



Caution • DO NOT heat, disassemble or dispose of battery in fire.

Fuses

There are no replaceable fuses in these printers or power supplies.

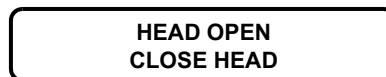
Troubleshooting

This section provides troubleshooting procedures and information.

Resolving Alerts and Errors

Alert: Printhead Open

A print command or a FEED button has been pressed and the printer has detected that the printhead (cover) is not closed.



Possible Cause - 1

The cover is open or has not been closed properly.

Resolution

Close the cover/printhead. Push down on the front top corners of the printer's cover. You should normally hear and feel the cover latches snap in place to lock the cover closed for printing.

See [Closing the printer](#).

Possible Cause - 2

The printer's Head-Open switch needs service.

Resolution

Call a service technician.

Alert: Media Out

A print command, a FEED button has been pressed, or you are printing; and the printer can not detect media in the print path.



Possible Cause - 1

There is no media (roll) in the printer.

Resolution

Load your chosen media in the printer and close the printer. You may need to press the FEED button once or the PAUSE button to get the printer to resume your print operation. See [Loading Roll Media](#).

Possible Cause - 2

Open the printer: If there is a missing label on the roll between two labels at the end of a roll of labels, then this is the method used by the label roll manufacture to identify the end of the roll. See [Detecting a Media Out Condition](#).

Resolution

Replace the empty media roll and continue printing. Do not power the print off or you will lose your print job. See [Detecting a Media Out Condition](#).

Possible Cause - 3

Misaligned media sensor.

Resolution

Check the position of the media sensor. See [Using the Movable Sensor](#).

The printer may need to be calibrated for the media after the adjusting the sensor location. See [Run a SmartCal Media Calibration](#).

Possible Cause - 4

The printer is set for noncontinuous (labels or black mark) media, but continuous media is loaded.

Resolution

Check the position of the media sensor is in the center default location. See [Using the Movable Sensor](#).

The printer may need to be calibrated for the media after the adjusting the sensor location. See [Run a SmartCal Media Calibration](#).

Possible Cause - 5

The media sensor is dirty.

Resolution

Clean the Upper Web (Gap) Sensor Array and the lower Movable Media sensors. See [Sensor Cleaning](#).

Reload your media, adjust the Movable Media sensor's position for your media, and recalibrate the printer for the media. See [Loading Roll Media](#) and [Run a SmartCal Media Calibration](#).

Possible Cause - 6

The media sensing is not working. Possible data corruption of memory or faulty components.

Resolution

1 — Reload the printer's firmware. See [Updating Printer Firmware](#).

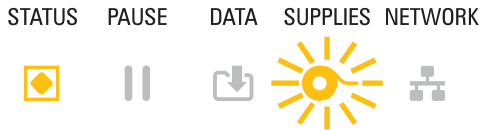
2 — If this does not fix this issue, call a service technician.

Alert: 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.



Note • The printer has two different heat settings - one for Direct Thermal and one for Thermal Transfer. They are designed to have equivalent print density/darkness at the same setting level.



**WARNING
RIBBON IN**

Possible Cause - 1

There is a Ribbon Cartridge in the printer while the printer is set to Direct Thermal Mode (and printing on direct thermal media).

Resolution

Remove the ribbon cartridge from the printer without turning the printer OFF. Close the printer. You may need to press the FEED button once or the PAUSE button to get the printer to resume your print operation.

Possible Cause - 2

The printer is incorrectly set to Direct Thermal Mode when you are trying to print using Transfer Media and Ribbon Cartridge to print.

Resolution

Change the PRINT METHOD to THERMAL TRANS (Thermal Transfer) mode. The print format/form send for this print job may have Direct Thermal mode set with a ^MTD set instead of ^MTT. See the ZPL Programmer's Manual for details on printer programming. For printer links to manuals, see the [About](#) section of this guide.

To change this setting:

- Use the printer's LCD user interface (if present) to change the setting. See [PRINT METHOD](#) in Printer Configuration Menus chapter.
- Use an Ethernet (LAN or WLAN) printer's Print Server Web page to access and set the PRINT METHOD to THERMAL TRANS (Thermal Transfer) mode. See [PRINT METHOD](#) in Printer Configuration Menus chapter for navigating the print server users interface.

Alert: Ribbon Out

- 1 — The printer is printing and stops while printing.
- 2 — A print job has been sent to the printer and the printer immediately reports this Alert.



Possible Cause - 1

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.

Resolution

Remove the ribbon and replace the ribbon rolls or ribbon cartridge in the printer without turning the printer OFF. Close the printer. You may need to press the FEED button once or the PAUSE button to get the printer to resume your print operation. See [Detecting a Ribbon Out Condition](#).

Possible Cause - 2 (ZD420 Cartridge Printer 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](#).

Possible Cause - 3 (ZD420 Cartridge Printer only)

The media sensing is not working. Possible dirty ribbon cartridge data chip or cartridge sensor contacts; data corruption of memory; or faulty cartridge or printer components.

Resolution

- 1 — Try another working ribbon cartridge, if available.
- 2 — Clean the Ribbon Cartridge chip with an alcohol moistened swab.
- 3 — Clean the Ribbon Cartridge Sensor's contact pins. See [Upper Half of ZD420 Thermal Transfer Ribbon Cartridge Printers](#) for cleaning instructions.
- 4 — Reload the printer's firmware. See [Updating Printer Firmware](#).
- 5 — If this does not fix this issue, call a service technician.

Possible Cause - 4 (Standard Roll - Thermal Transfer Printers)

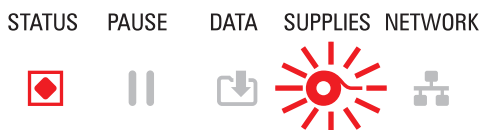
The media sensing is not working.

Resolution

- 1 — Reload the printer's firmware. See [Updating Printer Firmware](#).
- 2 — If this does not fix this issue, call a service technician.

Alert: Ribbon Low (ZD420 Cartridge Printer only)

The printer reports this Alert.



Possible Cause - 1

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 by programming.

Resolution

Check for the availability of ribbon cartridges. To change the Ribbon Low warning point, see the SGD commands - [Ribbon Cartridge Programming Commands](#). See the ZPL Programmer's Manual for details on printer programming. For printer links to manuals, see the [About](#) section of this guide.

Alert: CUT ERROR

The cutter blade is bound and is not moving properly



Possible Cause - 1

Media, adhesive, or external object has stopped the cutter blade from operating.

Resolution

- 1 — Turn the printer off by holding the power using the POWER button down for 5 seconds. Wait for the printer to shutdown completely. Turn the printer on.
- 2 — If the printer does not recover from this error, call a service technician. This is not a operator serviceable item.



Cut Warning • 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. all may damage or shorten the cutter's usable life or cause the cutter to jam.

Alert: PRINTHEAD OVER TEMP

1. The printhead is over temperature and paused to allow the printhead to cool.



Possible Cause - 1

The printer is printing a large batch job, typically with large amounts of print.

Resolution

The print operation will resume after the printhead has cooled.

Possible Cause - 2

The ambient temperature at the printers location exceeds the specified operating range. Sometimes, ambient temperatures in the printer can be higher if it is in direct sunlight.

Resolution

Move the printer location or cool ambient temperature where the printer is operating.

Alert: PRINTHEAD SHUTDOWN

The printhead is below operating temperature for proper printing.



Possible Cause - 1

Printhead has had a critical temperature or power failure

Resolution

1 — Turn the printer off by holding the power using the POWER button down for 5 seconds. Wait for the printer to shutdown completely. Turn the printer on.

2 — If the printer does not recover from this error, call a service technician. This is not a operator serviceable item.

Alert: PRINTHEAD UNDER TEMP

1. The printhead is below operating temperature for proper printing.



PRINTHEAD UNDER TEMP
PRINTING HALTED

THERMISTOR
REPLACE PRINTHEAD

Possible Cause - 1

The ambient temperature at the printers location is below the specified operating range.

Resolution

Turn the printer off. Move the printer location and wait for it to warm naturally. Moisture may condense in and on the printer if the temperature changes too quickly.

Possible Cause - 2

The printhead thermistor has failed.

Resolution

- 1 — Turn the printer off by holding the power using the POWER button down for 5 seconds. Wait for the printer to shutdown completely. Turn the printer on.
- 2 — If the printer does not recover from this error, call a service technician.

Alert: OUT OF MEMORY

Can not store data in the printer in the specified memory location. There are four types of storage memory: Graphic, Format, Bitmap and Font. There is not enough memory to perform the function specified on the second line of the error message.

STATUS PAUSE DATA SUPPLIES NETWORK



OUT OF MEMORY
STORING GRAPHIC

OUT OF MEMORY
STORING FORMAT

OUT OF MEMORY
STORING BITMAP

OUT OF MEMORY
STORING FONT

Possible Cause - 1

There is not enough memory to perform the function specified on the second line of the error message.

Resolution

- 1 — Free up some of the printer's memory by adjusting the label format or printer parameters to make the print area smaller.
- 2 — Remove unused graphics, fonts, or formats.
- 3 — Ensure that the data is not directed to a device that is not installed or is unavailable.

Resolving Print Issues

This section helps you identify issues with printing or print quality, the possible causes, and the recommended solutions.

Issue: **General Print Quality Issues**

The printed image does not look right.

Possible Cause - 1

The printer is set at an incorrect darkness level and/or print speed.

Resolution

Perform the Print Quality Report (FEED self test) to determine the ideal darkness and speed settings for your application. Do not set print speeds above the manufacturer's maximum rated speed for your media (print material and ribbons both). See [Print Quality Report \(FEED self test\)](#) and [Adjusting the Print Quality](#).

Possible Cause - 2

The printhead is dirty.

Resolution

Clean the printhead. See [Cleaning the Printhead](#).

Possible Cause - 3

The platen roller is dirty or damaged.

Resolution

Clean or replace the platen. Platens can wear out or get damaged. See [Platen Cleaning and Replacement](#).

Possible Cause - 4

The printhead has worn out.

Resolution

Replace the printhead. The printhead can wear out and be damaged. See [Replacing the Printhead](#).

Possible Cause - 5

Thermal Transfer printing - Printing looks fuzzy, has smudge marks, or has voids or holes in print with no particular pattern.

Resolution

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](#) for reading cartridge features.

Possible Cause - 6

You may be using the wrong power supply.

Resolution

Verify you are using the power supply that came with this printer.

Issue: No Print on the Label

The printed image does not look right.

Possible Cause - 1

The media may not be direct thermal media (and is thermal media made for thermal transfer printers).

Resolution

See the test procedure, [Determining Thermal Media Types](#).

Possible Cause - 2

Media has been loaded incorrectly.

Resolution

The media printable surface must face up towards the printhead. See [Getting Ready to Print](#) followed by [Loading Roll Media](#).

Issue: Labels Are Distorted in Size or Print Area Start Position Varies

Includes printed image that skips between labels (mis-registration).

Possible Cause - 1

Media has been loaded incorrectly or the movable media sensor is not set properly.

Resolution

Verify that the sensor is set and positioned correctly for your media type and sensing location. See [Loading Roll Media](#), [Setting Media Sensing by Media type](#), and [Using the Movable Sensor](#).

Possible Cause - 2

The media sensors are not calibrated for your media length, physical properties, or sensing type (gap/notch, continuous, or mark).

Resolution

See [Run a SmartCal Media Calibration](#). or if it still skips labels try a [Manual Media Calibration](#).

Possible Cause - 3

The platen (drive) roller is slipping or damaged.

Resolution

Clean or replace the platen. Platens can wear out or get damaged. See [Platen Cleaning and Replacement](#).

Possible Cause - 4

The printer has communication issues with cables or communication settings.

Resolution

See [Communication Issues](#).

Communication Issues

This section identifies problems with communications, the possible causes, and the recommended solutions.

Issue: **Label Job Sent, No Data Transfer**

A label format was sent to the printer but was not recognized. The DATA light does not flash.

Possible Cause

The communication parameters are incorrect.

Resolution - 1

Check the printer driver or software communications settings (if applicable).

Resolution - 2

Serial Port Only - Check the printer's handshake protocol and serial port settings. The setting used must match the one being used by the host computer. See [Serial Interface](#) for the printer's default serial port settings.

Resolution - 3

The serial cable you are trying to use may not be a standard DTE or DCE type cable, is damaged, or is too long per the RS-232 Serial ports specifications. See [Serial Port Interface](#).

Issue: **Label Job Sent, Skips Labels or Prints Bad 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.

Possible Cause

The serial communication settings are incorrect.

Resolution - 1

Check the printer driver or software communications settings (if applicable). Ensure that the flow control settings and other serial port handshake setting match the host system.

Issue: Label Job Sent, Data Transfers, But No Print

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

Possible Cause - 1

The prefix and delimiter characters set in the printer do not match the ones in the label format.

Resolution

Verify the ZPL programmings prefix (COMMAND CHAR) and delimiter (DELIM./CHAR) characters. [Configuration Setting to Command Cross-reference.](#)

Possible Cause - 2

Incorrect data is being sent to the printer.

Resolution

Check the communication settings on the computer. Ensure that they match the printer settings.

Possible Cause - 3

Incorrect data is being sent to the printer.

Resolution

Check the label format. See the ZPL Programmer's Manual for details on printer programming. For printer links to manuals, see the [About](#) section of this guide.

Miscellaneous Issues

This section identifies miscellaneous issues with the printer, the possible causes, and the recommended solutions.

Issue: **Settings are Lost or Ignored**

Some parameters are set incorrectly.

Possible Cause - 1

Printer settings were changed without saving them.

Resolution

The ZPL **^JU** command was not used to save your configuration before turning the printer off. Cycle the printer OFF and then back ON to verify settings have been saved.

Possible Cause - 2

The label format/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.
- A firmware command changed the parameter back to default setting.

Resolution

See the ZPL programmer's guide to verify command usage and syntax. See the [About](#) section for support links. to view the programmer' guide for your printer model.

Possible Cause - 3

The prefix and delimiter characters set in the printer do not match the ones in the label format.

Resolution

Verify the ZPL programming settings of the Control, Command and Delimiter settings are correct for your system software environment. Print a Configuration Report or use display's Language Menu (if present) for these three (3) menu items and compare it the commands in label format/form you are trying to print. See [Test Printing with the Configuration Report, LANGUAGE Menu, and ZPL Configuration](#).

Possible Cause - 4

The Main Logic board may not be working properly. Firmware is corrupted or the Main Logic board needs service

Resolution

- 1 — Reset the printer to factory defaults. See [LOAD DEFAULTS](#) or use the Zebra Setup Utility and **Open Printer Tools > Action > Load printer defaults**.
- 2 — Reload printer firmware. See [Updating Printer Firmware](#).

3 — If the printer does not recover from this error, call a service technician. This is not a user serviceable item.

Issue: **Non-continuous labels act as Continuous labels.**

A non-continuous label format with matching media loaded in the printer, was sent to the printer but prints like it is continuous media.

Possible Cause - 1

The printer was not calibrated for the media being used.

Possible Cause - 2

The printer is configured for continuous media.

Resolution

Set the printer for the correct media type (gap/notch, continuous, or mark) and calibrate the printer using [Run a SmartCal Media Calibration](#), if necessary use [Manual Media Calibration](#) for hard to calibrate media types. See [MEDIA TYPE](#) (SETTINGS menu item) for ZD620 printers with the display to check and set media type.

Issue: **Printer Locks-Up**

All indicator lights are on and the printer locks up or the printer locks up while restarting.

Possible Cause - 1

The printer memory has been corrupted by an unknown event.

Resolution - 1

1 — Reset the printer to factory defaults. See [LOAD DEFAULTS](#) or use the Zebra Setup Utility and **Open Printer Tools > Action > Load printer defaults.**

2 — Reload printer firmware. See [Updating Printer Firmware](#).

3 — If the printer does not recover from this error, call a service technician. This is not a user serviceable item.

Issue: **Erroneous Ribbon Cartridge Faults**

1 — **Ribbon Out** warning, but a ribbon cartridge is installed.

2 — **Ribbon Cartridge Authentication** error, but a Genuine Zebra Ribbon Cartridge is installed and has not been refurbished or altered.

Possible Cause

The Ribbon Cartridge Sensor Contact Pins or the Ribbon Cartridge's Smart Chip's contacts may be dirty or the chip may be damaged.

Resolution

- 1 — Clean the ribbon cartridge's smart chip contact, if they look contaminated, with alcohol and a lightly moistened cotton. Try a different cartridge if this does not work.
- 2 — Clean the Ribbon Cartridge Sensor Contact Pins - see [Cleaning Ribbon Cartridge Sensor](#).
- 3 — Reload printer firmware. See s.
- 4 — If the printer does not recover from this error, call a service technician. This is not a user serviceable item.

Issue: **Battery has a Red Indicator**

Battery has a fault.

Possible Cause - 1

The battery has reached its usable life or has a general component failure.

Possible Cause - 2

Battery is too hot or too cold

Resolution

- 1 — Remove the battery from the printer and check charge status by charging the battery.
- 2 — Let the battery cool down or warm up to ambient temperature and recheck the battery charge.
- 3 — 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)

Printer Diagnostics

Diagnostic reports, calibration procedures, restoring factory defaults and other diagnostics provide specific information about the condition of the printer.



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.



Note • Diagnostic Testing Tips:

- When performing these self tests, do not send data to the printer from the host. If your media is shorter than the label to be printed, the test label continues on the next label.
- When canceling a self test prior to completion, always reset the printer by turning it OFF and then ON.
- If the printer is in dispense mode and the liner is being taken up by the applicator, the operator must manually remove the labels as they become available.

Each self test is enabled by pressing a specific user interface button or combination of buttons while turning ON the printer power. Keep the button(s) pressed until the first indicator light turns off. The selected self test automatically starts at the end of the Power-On Self Test.

Power-On Self Test

A Power-On Self Test (POST) is performed each time the 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.

SmartCal Media Calibration

SmartCal is used to quickly calibrate the printer to the media currently loaded. During SmartCal, the printer will automatically determine the media sensing type (gap, black line or notch) and then measure the length of the media.

To activate Smart Calibration, complete these steps:

1. Make sure media is properly loaded, the printer cover is closed, and printer power is ON.
2. Press and hold PAUSE + CANCEL buttons for two seconds.
3. The printer will FEED and measure several labels. When done, the printer will return to READY status.

If the printer should fail to recognize and correctly calibrate to the media, please refer to the [Manual Media Calibration](#) procedure later in this section.

Configuration Report (CANCEL Self Test)

The Configuration Report diagnostic prints a set of printer and network configuration reports.

To print the configuration report, complete these steps:

1. Make sure media is loaded, the printer cover is closed, and printer power is ON.
2. If printer power is OFF, press and hold CANCEL button while turning the printer power ON. Hold CANCEL button down until the STATUS indicator is the only indicator lit.
- or -
If printer power is ON, press FEED + CANCEL for two seconds.
3. The Printer and Network Configuration Reports (below) will be printed and the printer will return to READY status.

Sample Printer Configuration

PRINTER CONFIGURATION	
Zebra Technologies ZTC ZD620-203dpi ZPL 50J164202531	
+15.0.....	DARKNESS
LOW.....	DARKNESS SWITCH
8.0 IPS.....	PRINT SPEED
+000.....	TEAR OFF ADJUST
TEAR OFF.....	PRINT MODE
CONTINUOUS.....	MEDIA TYPE
TRANSMISSIVE.....	SENSOR SELECT
DIRECT-THERMAL.....	PRINT METHOD
830.....	PRINT WIDTH
2030.....	LABEL LENGTH
39.0IN 98MM.....	MAXIMUM LENGTH
PAINT OFF.....	EARLY WARNING
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
DISABLED.....	LEFT POSITION
045.....	REPRINT MODE
098.....	WEB SENSOR
128.....	TAKE LABEL
062.....	MARK SENSOR
004.....	MARK MED SENSOR
046.....	TRANS GAIN
034.....	TRANS LED
048.....	MARK GAIN
100.....	MARK LED
DPCSMFM.....	MODES ENABLED
.....	MODES DISABLED
832 8MM FULL.....	RESOLUTION
4.0.....	LINK-OS VERSION
V84.20.072P37536 <-	FIRMWARE
1.3.....	XML SCHEMA
6.S.0 0.770.....	HARDWARE ID
8192k.....	RAM
65536k.....	ONBOARD FLASH
NONE.....	FORMAT CONVERT
F4 VERSION.....	IDLE DISPLAY
06/08/17.....	RTC DATE
07:07.....	RTC TIME
DISABLED.....	ZBI
2.1.....	ZBI VERSION
READY.....	ZBI STATUS
178 LABELS.....	NONRESET CNTR
178 LABELS.....	RESET CNTR1
178 LABELS.....	RESET CNTR2
1,290 IN.....	NONRESET CNTR
1,290 IN.....	RESET CNTR1
1,290 IN.....	RESET CNTR2
3,277 CM.....	NONRESET CNTR
3,277 CM.....	RESET CNTR1
3,277 CM.....	RESET CNTR2
002 WIRED SERIAL.....	SLOT 1
0.....	MASS STORAGE COUNT
0.....	HID COUNT
OFF.....	USB HOST LOCK OUT
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

Sample Network Configuration

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
172.029.001.003.....	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:b9:17:b8.....	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.....	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	
4.3.1p1.....	FIRMWARE
02/13/2015.....	DATE
on.....	DISCOVERABLE
3.0/4.0.....	RADIO VERSION
on.....	ENABLED
AC:3F:A4:B9:17:B9.....	MAC ADDRESS
50J164202531.....	FRIENDLY NAME
no.....	CONNECTED
1.....	MIN SECURITY MODE
nc.....	CONN SECURITY MODE
supported.....	10S
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. This information needed to establish and trouble shoot Ethernet (LAN and WLAN), Bluetooth 4.1 and Bluetooth LE network printing. The following printout is printed with the ZPL `~WL` command.

```

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
172.029.001.003... 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
9194h..... CARD PRODUCT ID
ac:3f:a4:89:17:b8... 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..... 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
4.3.1p1..... FIRMWARE
02/13/2015..... DATE
on..... DISCOVERABLE
3.0/4.0..... RADIO VERSION
on..... ENABLED
ac:3f:a4:89:17:b9... MAC ADDRESS
50J164202531..... FRIENDLY NAME
no..... CONNECTED
1..... MIN SECURITY MODE
nc..... CONN SECURITY MODE
supported..... iOS

FIRMWARE IN THIS PRINTER IS COPYRIGHTED
  
```

iOS Support Setting

iOS Bluetooth Support

- 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 and is noted as 'supported' on the bottom of the Bluetooth Configuration report.
- Some ZD420 series printers only have the Bluetooth LE (without Wi-Fi and classic Bluetooth). The iOS setting is noted on the bottom of the Bluetooth Configuration report as 'not supported' when the wireless connectivity option is not installed.

Print Quality Report (FEED self test)

Different types of media may require different darkness settings. This section contains a simple but effective method for determining the ideal darkness for printing barcodes that are within specifications.

During the Print Quality Report (FEED self test), a series of labels are printed at different darkness settings at two different print speeds. The relative darkness and the print speed are printed on each label. The barcodes on these labels may be ANSI-graded to check 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).

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.

To perform a Print Quality Report, complete these steps:

1. Print a configuration report to show the printer's current settings. Press and hold the FEED and CANCEL buttons for two (2) seconds to print the report.
2. Turn OFF the printer.
3. Press and hold FEED while setting the printer power to ON. Hold FEED until the Status indicator is the only indicator lit.

The printer prints a series of labels (Figure 2) at various speeds and darkness settings higher and lower than the darkness value shown on the configuration label.

Figure 2 Print Quality Report



- See [Figure 3](#) and [Table 2](#). Inspect the test labels and determine which one has the best print quality for your application. If you have a barcode verifier, use it to measure bars/spaces and calculate the print contrast. 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

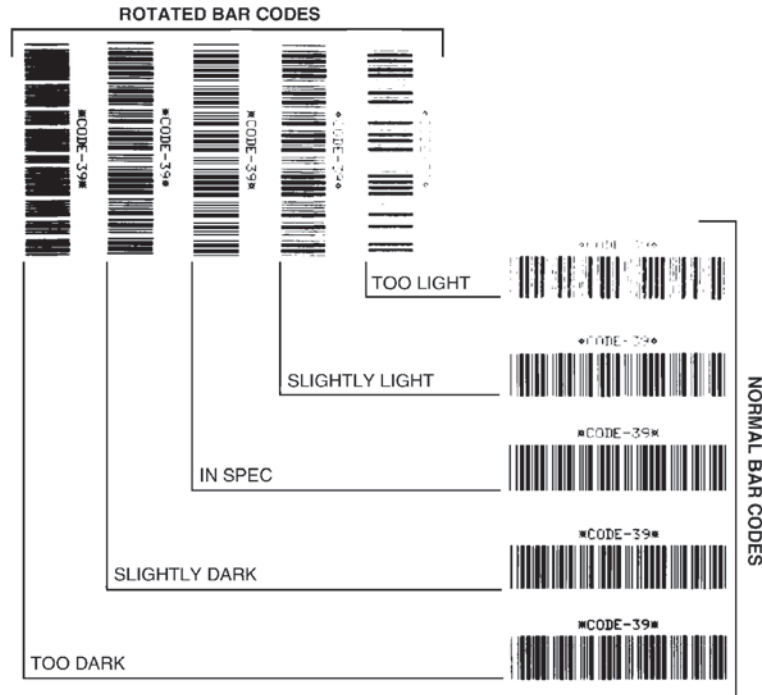


Table 2 Visual Darkness Descriptions


Print Quality	Description
<ul style="list-style-type: none"> • Too dark 	<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • Slightly dark 	<ul style="list-style-type: none"> • Slightly dark labels are not as obvious. • The normal barcode will be “in-spec.” • Small character alpha numerics will be 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.
<ul style="list-style-type: none"> • “In-spec” 	<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • Slightly light 	<ul style="list-style-type: none"> • Slightly light labels are, in some cases, preferred 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.
<ul style="list-style-type: none"> • Too light 	<ul style="list-style-type: none"> • 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 configuration label. The resulting numeric value is the best darkness value for that specific label/ribbon combination and print speed.
7. If necessary, change the current darkness value to the darkness value on the best test label.
8. If necessary, change the current print speed to the speed value on the best test label.

Reset Printer Factory Defaults (PAUSE + FEED Self Test)

This resets the printer configuration to the factory default values for the non-network printer settings. Perform a sensor calibration after this procedure. (See [Manual Media Calibration](#).)

To perform a Reset Printer Factory Defaults procedure, complete these steps:

1. Turn OFF the printer.
2. Press and hold PAUSE + FEED while turning ON the printer.
3. Hold PAUSE + FEED until the STATUS indicator () is the only indicator lit.

The printer configuration is reset to the factory default values. No labels print at the end of this action.




Note • The printer has a reset button under the printer, See the [Reset Button](#).

Reset Network Factory Defaults (PAUSE + CANCEL Self Test)

This procedure resets the network configuration settings only to the factory default values.

To perform a Reset Network Factory Defaults procedure, complete these steps:

1. Turn OFF the printer.
2. Press and hold PAUSE + CANCEL while turning ON the printer.
3. Hold PAUSE + CANCEL until the STATUS indicator () is the only indicator lit.

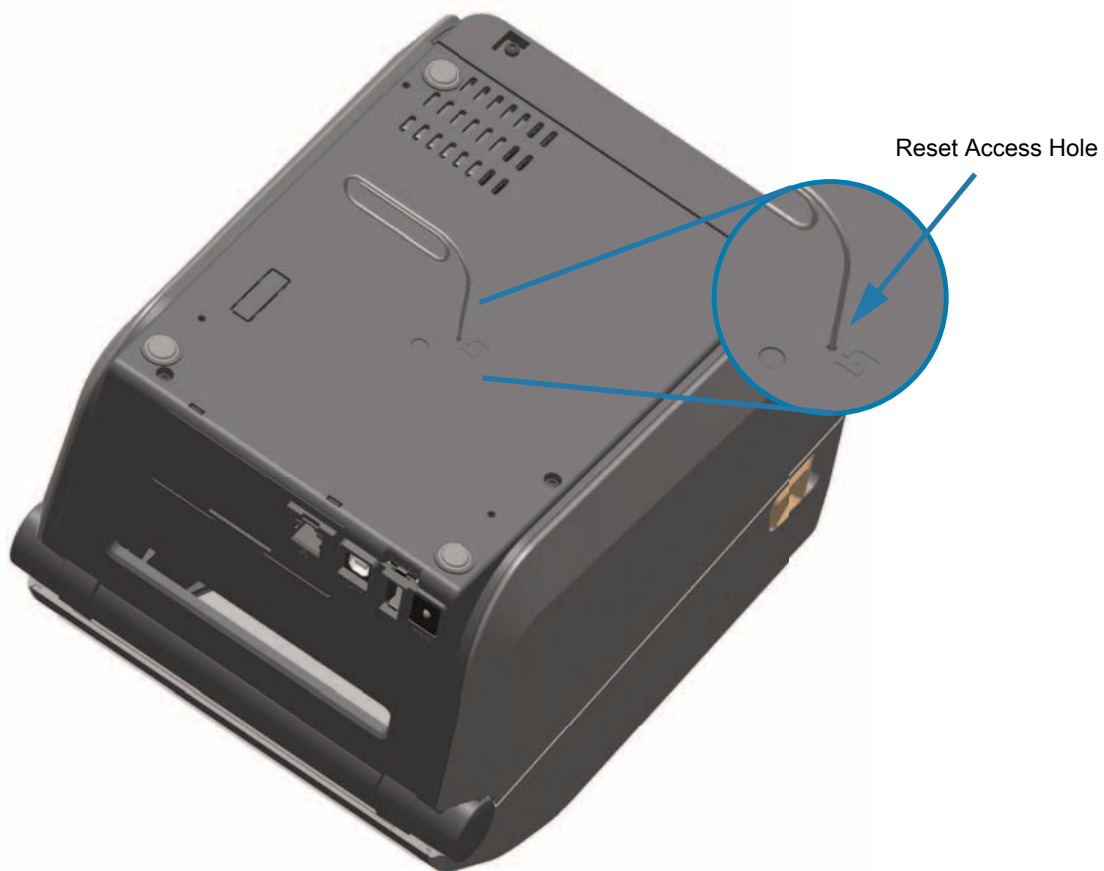
The printer's network configuration is reset to the factory default values. No labels print at the end of this action.

Reset Button

In addition to the power on configurations described previously, the ZD-Series printer has a dedicated reset button located on the bottom of the printer which can be pressed with a paperclip or similar small object.

Pressing the button has the following results based on the length of the button press:

0-1 second	No action
1-5 seconds	Printer reset – Printer performs a factory reset and will automatically print a configuration label (and network label if present)
6-10 seconds	Network reset – Printer drops connection to the network, and a network factory default reset occurs. Upon completion of the reset, a configuration and network configuration label are automatically printed.
More than 10 seconds	Exits the factory defaults function without resetting the printer or making changes



Communication Diagnostics Test

The communication diagnostics test is a troubleshooting tool for checking the connection between the printer and the host computer. When the printer is in diagnostics mode, it prints all data received from the host computer as straight ASCII characters with the hex values below the ASCII text. The printer prints all characters received, including control codes such as CR (carriage return). [Figure 4](#) shows a typical test label from this test.




Note • The test label prints upside-down as it exits the printer.

Figure 4 Communications Diagnostics Test Label



To use communications diagnostics mode, complete these steps:


1. Ensure media is loaded and printer power is ON.
2. Set the print width equal to or less than the label width being used for the test.
3. Press and hold Pause + FEED for two seconds. When active, the STATUS indicator () will alternate between green and yellow.
The printer enters diagnostics mode and prints any data received from the host computer on a test label
4. Check the test label for error codes. For any errors, check that your communication parameters are correct.
Errors show on the test label as follows:
 - **FE** indicates a framing error.
 - **OE** indicates an overrun error.
 - **PE** indicates a parity error.
 - **NE** indicates noise.
5. Press and hold Pause + FEED for two seconds or turn the printer power off (O) and then back ON to exit this self test and return to normal operation.

Sensor Profile

Use the sensor profile image (which will extend across several labels or tags) to troubleshoot the following situations:

- The printer experiences difficulty in determining gaps (web) between labels.
- The printer incorrectly identifies preprinted areas on a label as gaps (web).
- The printer cannot detect ribbon.

With the printer in the Ready state, print a sensor profile in one of these ways:

Using the buttons on the user interface	<ol style="list-style-type: none"> 1. Turn OFF the printer. 2. Press and hold FEED + CANCEL while turning ON the printer. 3. Hold FEED + CANCEL until the STATUS indicator () is the only indicator lit.
Using ZPL	Send the <code>~JG</code> command to the printer. See the Zebra Programming Guide for more information about this command.

Compare your results to the examples shown earlier in this section. If the sensitivity of the sensors must be adjusted, calibrate the printer (see [Manual Media Calibration](#)).

Media Sensor Profile (Figures 5 and 6)

The line labeled MEDIA (1) on the sensor profile indicates the media sensor readings. The media sensor threshold settings is indicated by WEB (2). The media out threshold is indicated by OUT (3). The upward spikes (4) indicate gaps between labels (the web), the lines between the spikes (5) indicate where labels are located, and the numbered line at the top (6) provides measurement in dots from the start of the printout.

If you compare the sensor profile printout to a length of your media, the spikes should be the same distance apart as the gaps on the media. If the distances are not the same, the printer may be having difficulty determining where the gaps are located.

Figure 5 Sensor Profile (Gap Media)

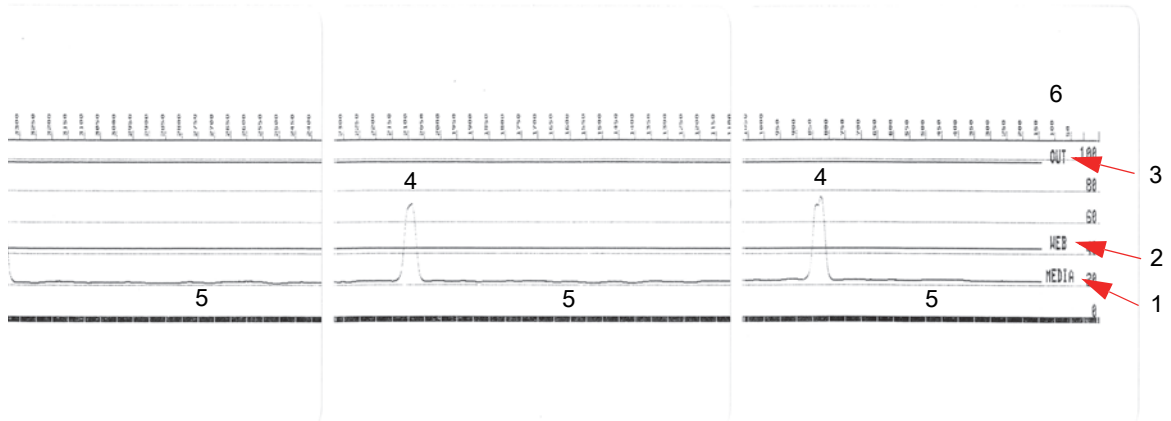
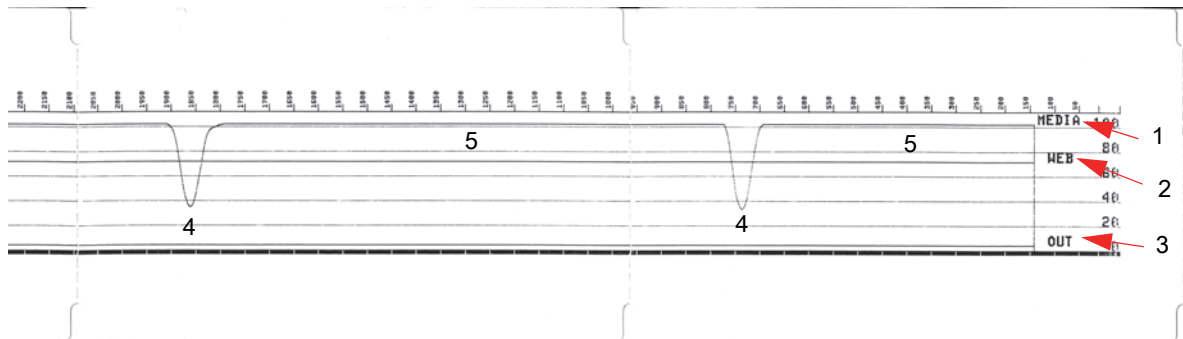



Figure 6 Sensor Profile (Black Mark Tag Media)




Advanced Mode





Advanced Mode is used to access several manual adjustment modes in the printer. Each manual adjustment mode is described in detail in the following sections.

To activate Advanced Mode, complete these steps:

1. Ensure media is loaded and printer power is ON.
2. Press PAUSE for two seconds, all indicators will flash yellow.
3. The STATUS indicator () will show solid yellow, indicating the currently selected mode is: Manual Media Calibration.
4. Pressing FEED will sequentially cycle through all available modes.
5. Pressing PAUSE will activate the selected mode.
6. Pressing CANCEL will exit Advanced Mode.


Manual Media Calibration

While in Advanced Mode, pressing PAUSE while the Status indicator () is illuminated yellow will start Manual Media Calibration.

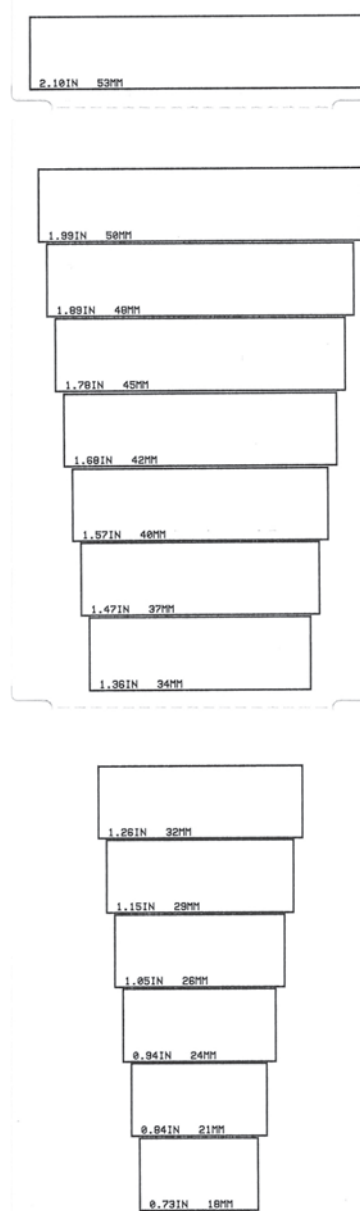
1. The MEDIA indicator () will flash yellow then the Pause indicator () will flash. Open the printer and verify the media sensor is in the center position for label gap (transmissive) sensing. Remove 3 inches or 80mm of labels from the liner. Place the label-less area of the liner over the platen (drive) roller with the leading edge of the first label under the media guides.
2. Close the printer and press PAUSE once. The MEDIA indicator () will flash as the media liner is measured. When complete, the Pause indicator () will begin flashing.
3. Open the printer and reposition the media so that a label is located directly above the movable sensor. Close the printer.
4. Press PAUSE once. The printer will FEED and measure several labels. If the printer is able to determine the correct media type (gap, black mark or notch) and measure the media length, the printer will return to the READY state.

This advanced mode is typically used to calibrate the printer to media that is not correctly recognized during Smart Calibration. If your media uses black mark or notch sensing, ensure the media sensor is in to the proper location to “see” the mark or notch. If your media is pre-printed, either on the front of the label or on the back of the liner, position the sensor so that it is in a position with minimal printing. You may need to perform Manual Media Calibration several times, moving the media sensor, until the printer completes the calibration process and returns to the READY state.

Manual Print Width Adjustment

While in Advanced Mode, pressing the PAUSE button while the Pause indicator () is illuminated yellow will start Manual Print Width Adjustment while in Advanced mode, see [Advanced Mode](#). The printer will print a 16mm (0.63 inch) box and pause momentarily. The printer will then print a slightly larger box and again pause. When you see the printer print a box that matches the width of your media, press FEED to set the print width and return to READY state.

To return to the maximum print width setting, allow the printer to proceed without pressing the FEED button.



Manual Print Darkness Adjustment

Pressing PAUSE while the DATA indicator (DATA) is illuminated yellow will start Manual Print Darkness Adjustment. The printer will print a test pattern showing the current darkness number and several barcode patterns and then pause momentarily. The printer 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 value and return to the READY state.



Factory Test Modes

The printer includes print modes that are intended for factory test only.

Test mode 1

Initiated by holding PAUSE button while turning ON printer power. When activated, the printer will begin printing various test patterns used to evaluate printer performance.

Test mode 2

Initiated by holding PAUSE + FEED + CANCEL button for two seconds while printer power is ON. When activated, the printer will begin printing various test patterns used to evaluate printer performance.



Note • Both of these test modes will consume a considerable amount of media as the tests are performed.

You can exit either of these test modes by pressing and holding POWER button until the printer power is switched OFF.

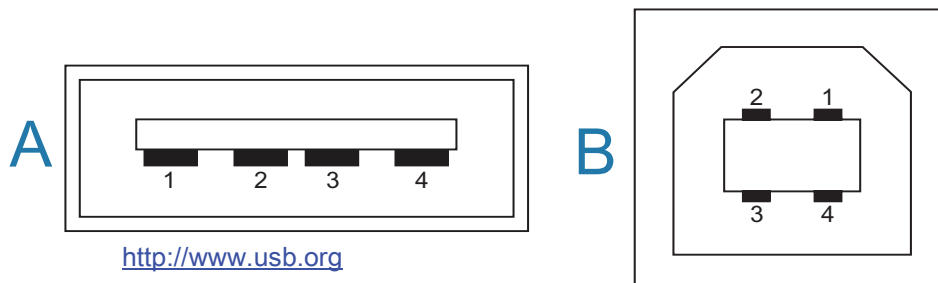
Interface Connector Wiring

Universal Serial Bus (USB) Interface

The figure below displays the cable wiring required to use the printer's USB two interfaces.



Important • When using third party cables, the printer requires USB cables or the cable packaging that bears the “Certified USB™” mark to guarantee USB 2.0 compliance.



Wiring - USB Connector “A” Style for “connecting to” the printer or device

Pin 1 — Vbus (+5VDC). (Pin 2 — D- (Data Signal, Negative Side)
Pin 3 — D+ (Data Signal, Positive Side)
Pin 4 — Shell (Shield/Drain Wire) Shell

Wiring - USB Connector “B” Style for “connecting to” the printer or device

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 will not exceed a total of 0.75 Amps.

Serial Port Interface

Zebra Auto-Detecting DTE and DCE for 9-Pin RS-232 Interface

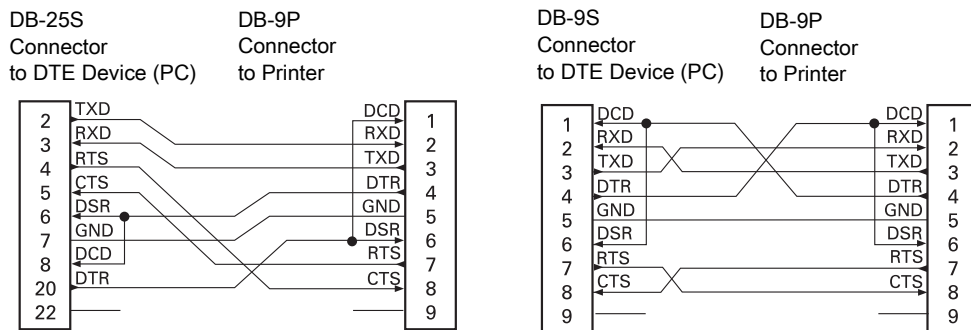
Pin	DTE	DCE	Description (DTE)
1	—	5V	Not used
2	RXD	TXD	RXD (receive data) input to the printer
3	TXD	RXD	TXD (transmit data) output from the printer
4	DTR	DSR	DTR (data terminal ready) output from the printer -- controls when the host may send data
5	GND	GND	Circuit ground
6	DSR	DTR	DSR (data set ready) 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.

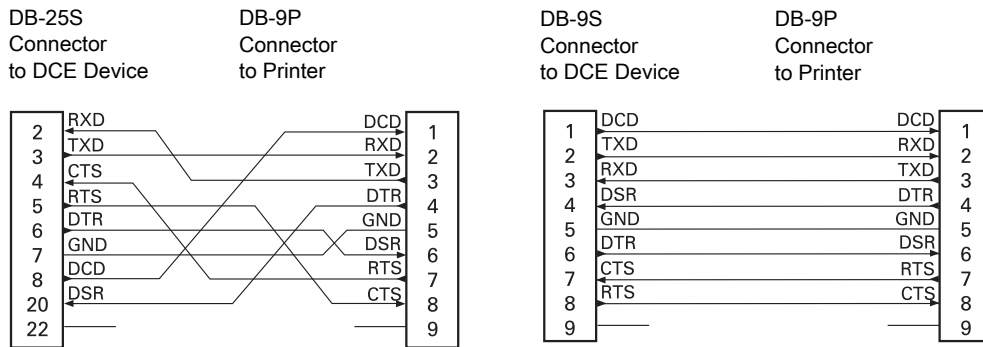
When XON/XOFF handshaking is selected in the printer driver, data flow is controlled by the ASCII control codes DC1 (XON) and DC3 (XOFF). The DTR control lead will have no effect.

Connecting the Printer to a DTE Device



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.

Connecting the Printer to a DCE Device



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.

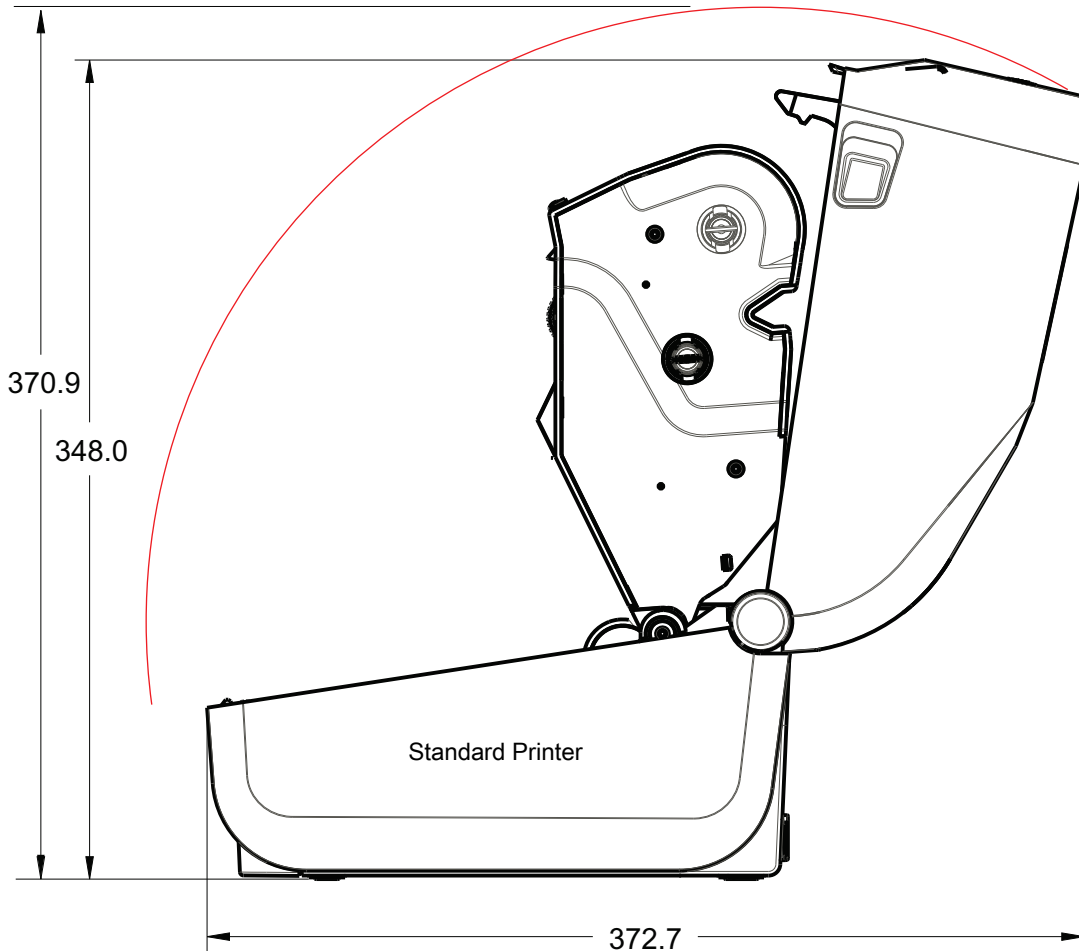
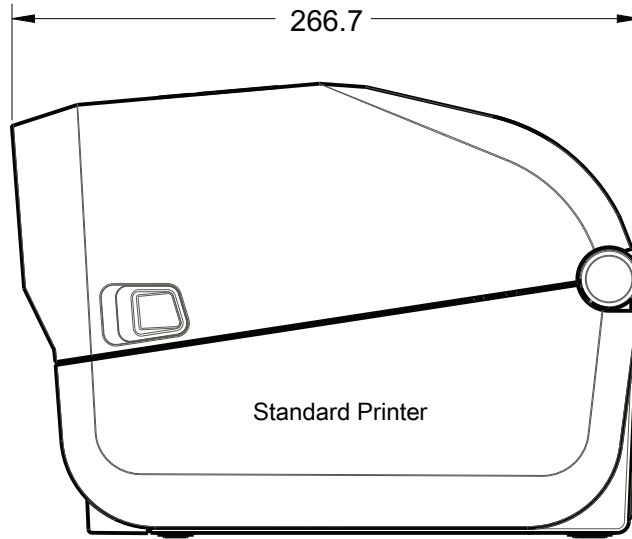
Dimensions

This section provides external printer dimensions. for the following printers:

- [ZD620 / ZD420 Thermal Transfer Models](#)
- [ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models](#)
- [ZD620 / ZD420 Direct Thermal Models](#)

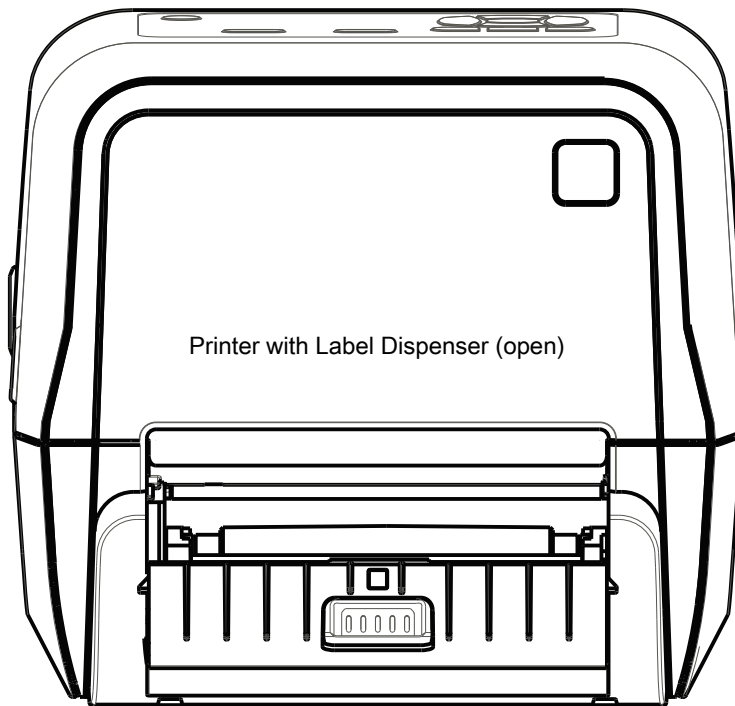
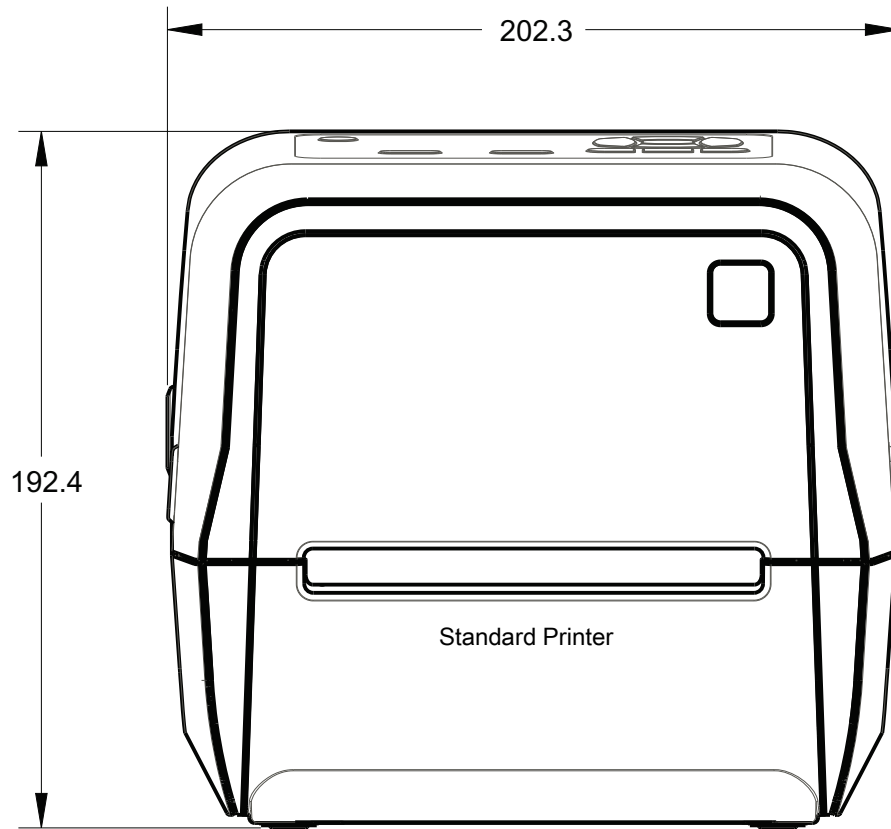
ZD620 / ZD420 Thermal Transfer Models

All dimension are in millimeters

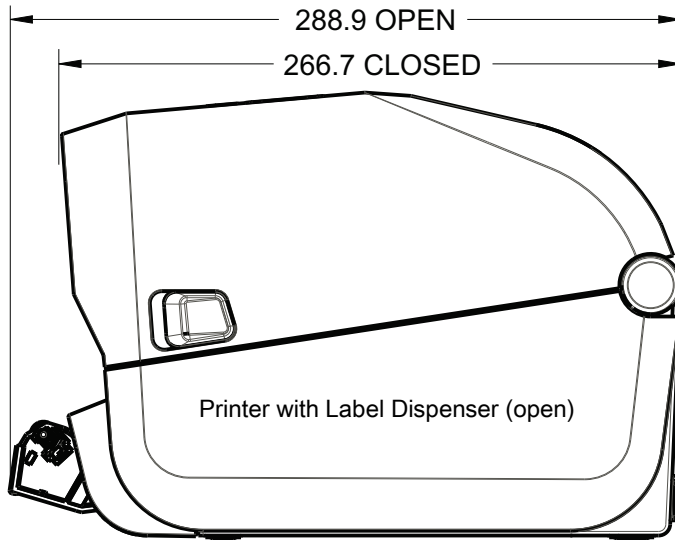


ZD620 / ZD420 Thermal Transfer Models

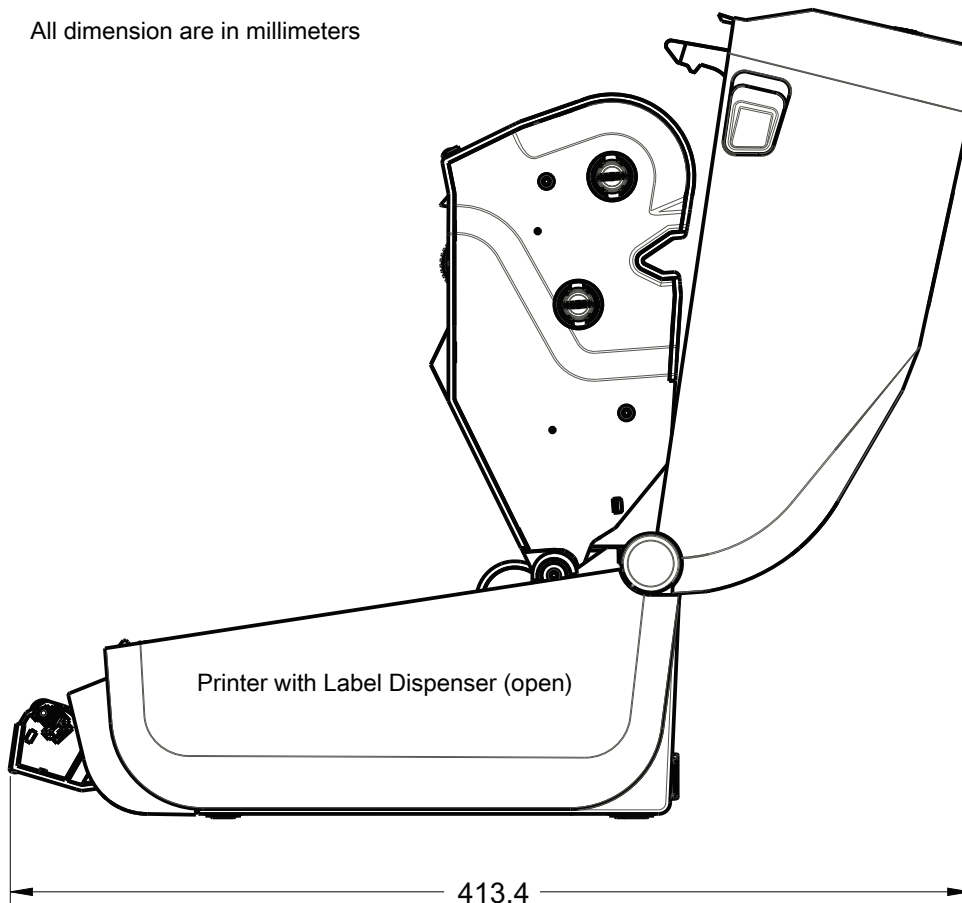
All dimension are in millimeters



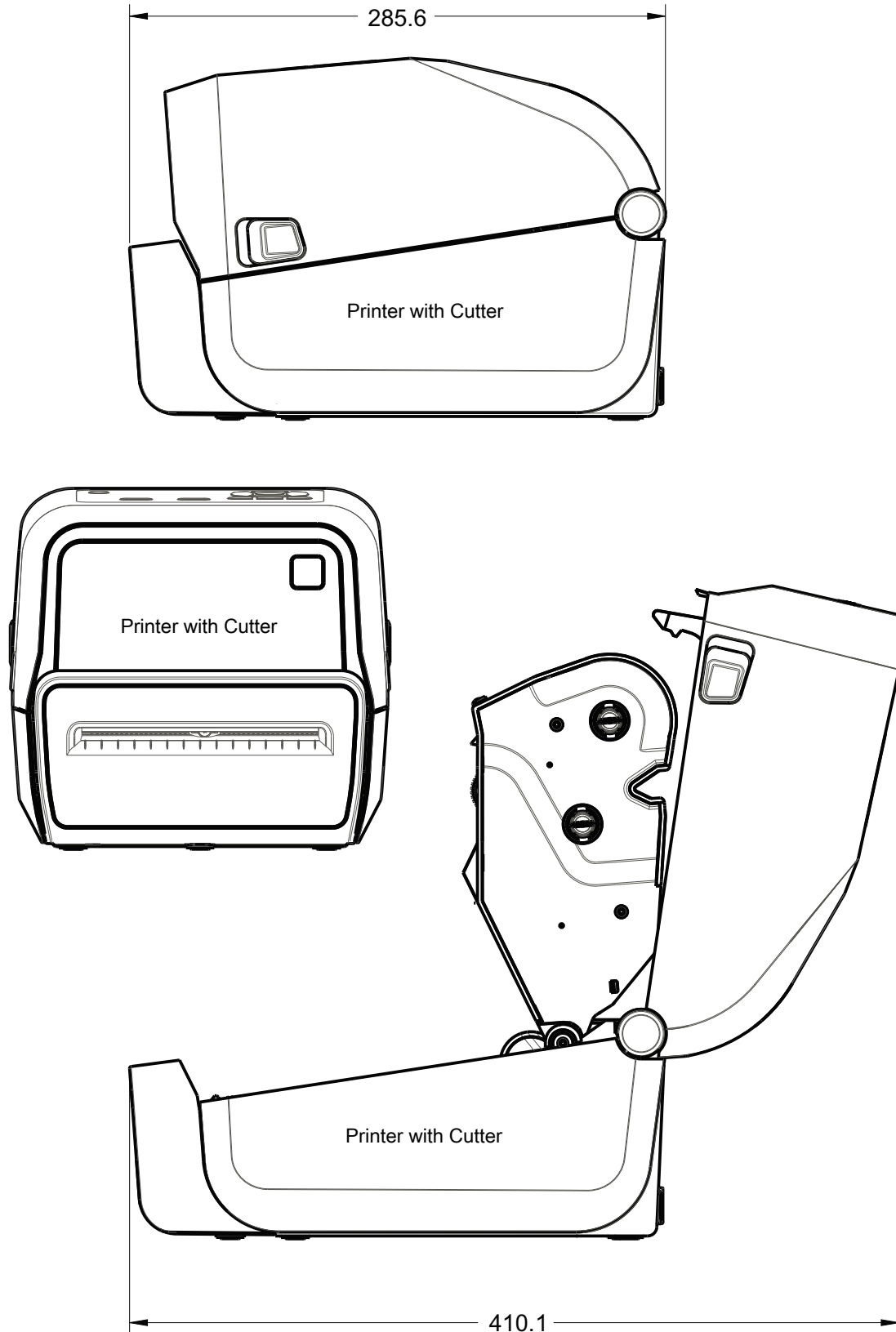
ZD620 / ZD420 Thermal Transfer Models



All dimension are in millimeters

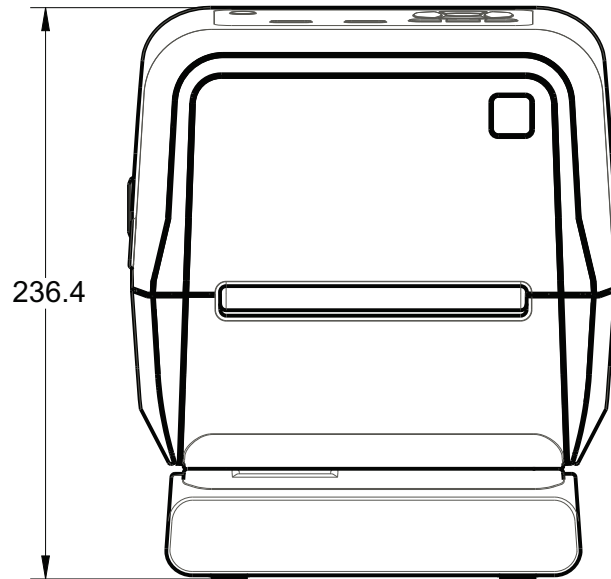


ZD620 / ZD420 Thermal Transfer Models

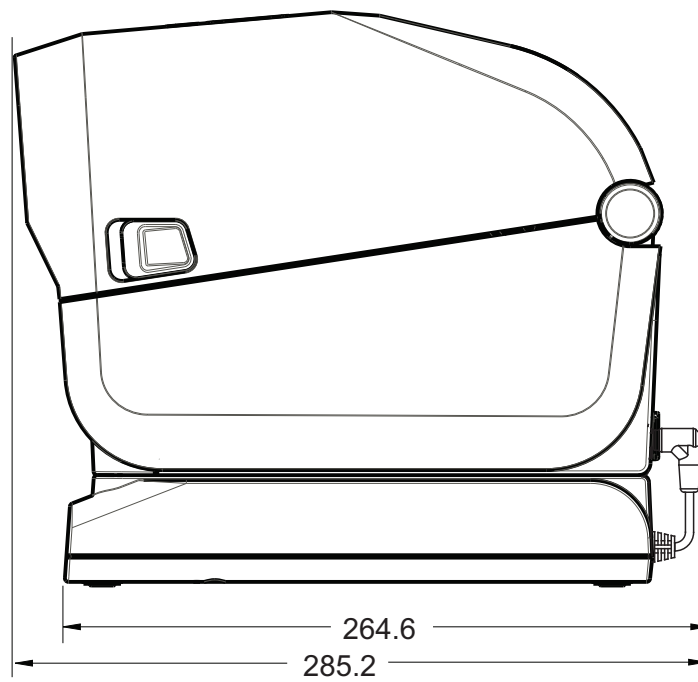


All dimension are in millimeters

ZD620 / ZD420 Thermal Transfer Models

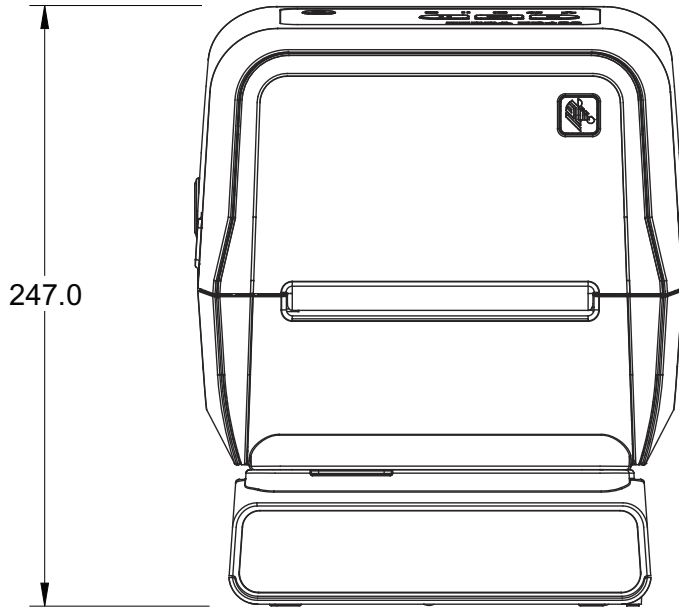


Printer with Attached Power Supply Base

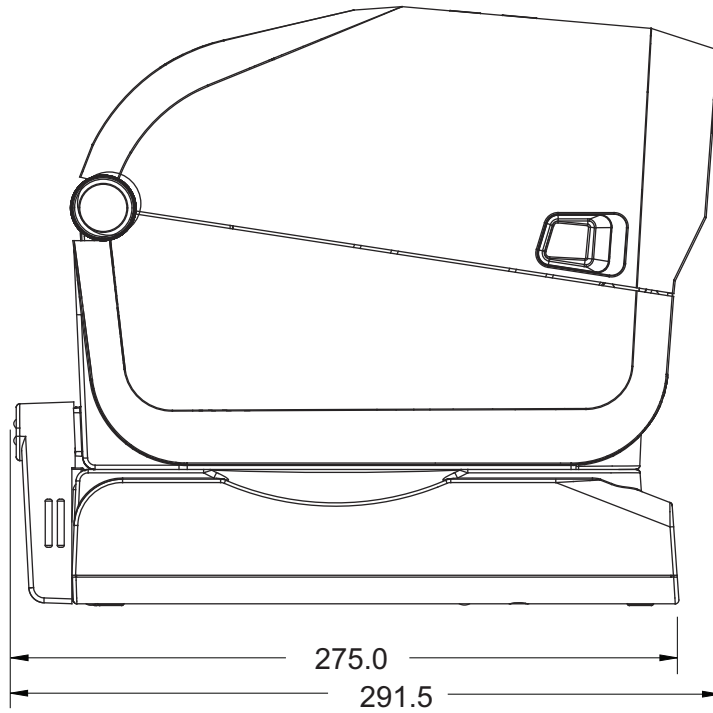


All dimension are in millimeters

ZD620 / ZD420 Thermal Transfer Models



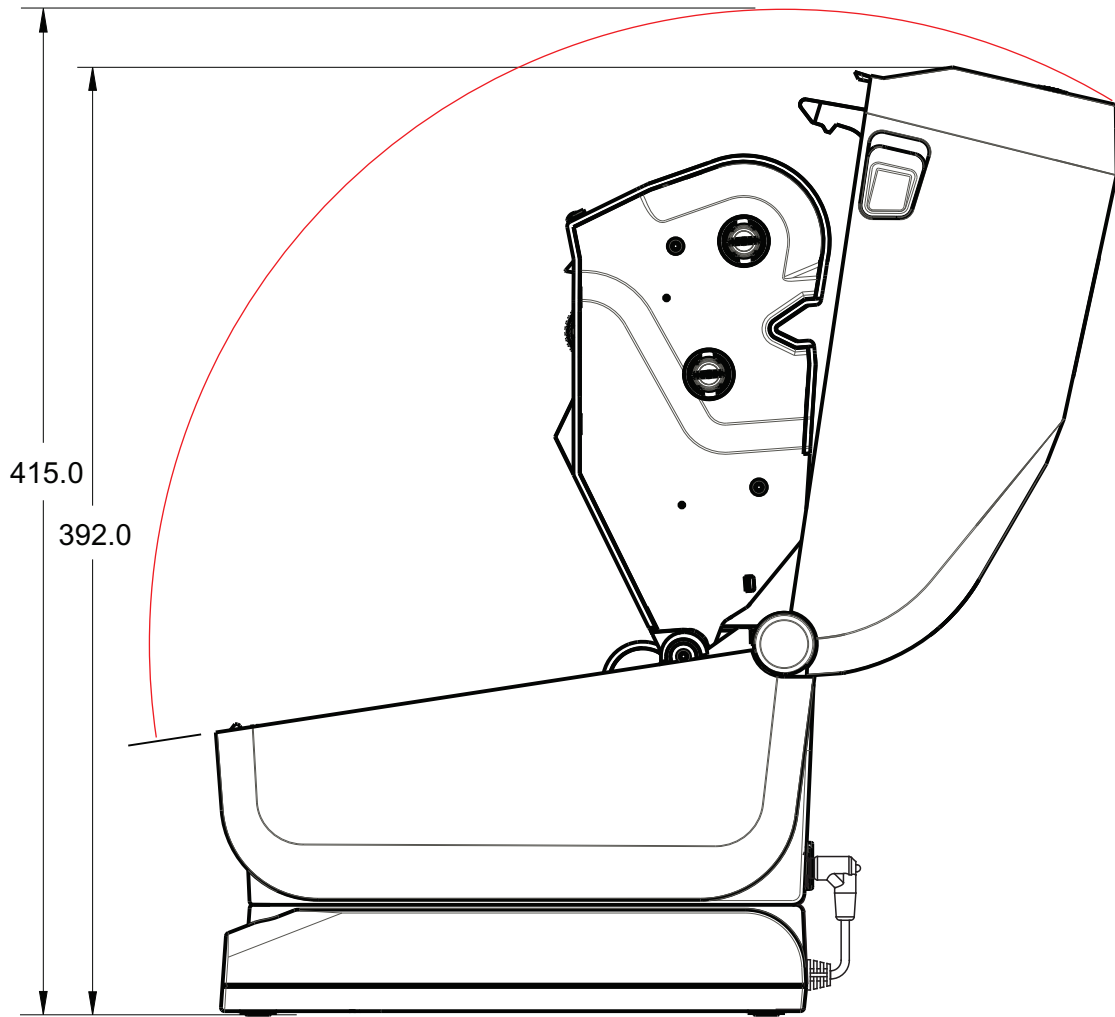
Printer with Attached Battery Base and Battery



All dimension are in millimeters

ZD620 / ZD420 Thermal Transfer Models

All dimension are in millimeters

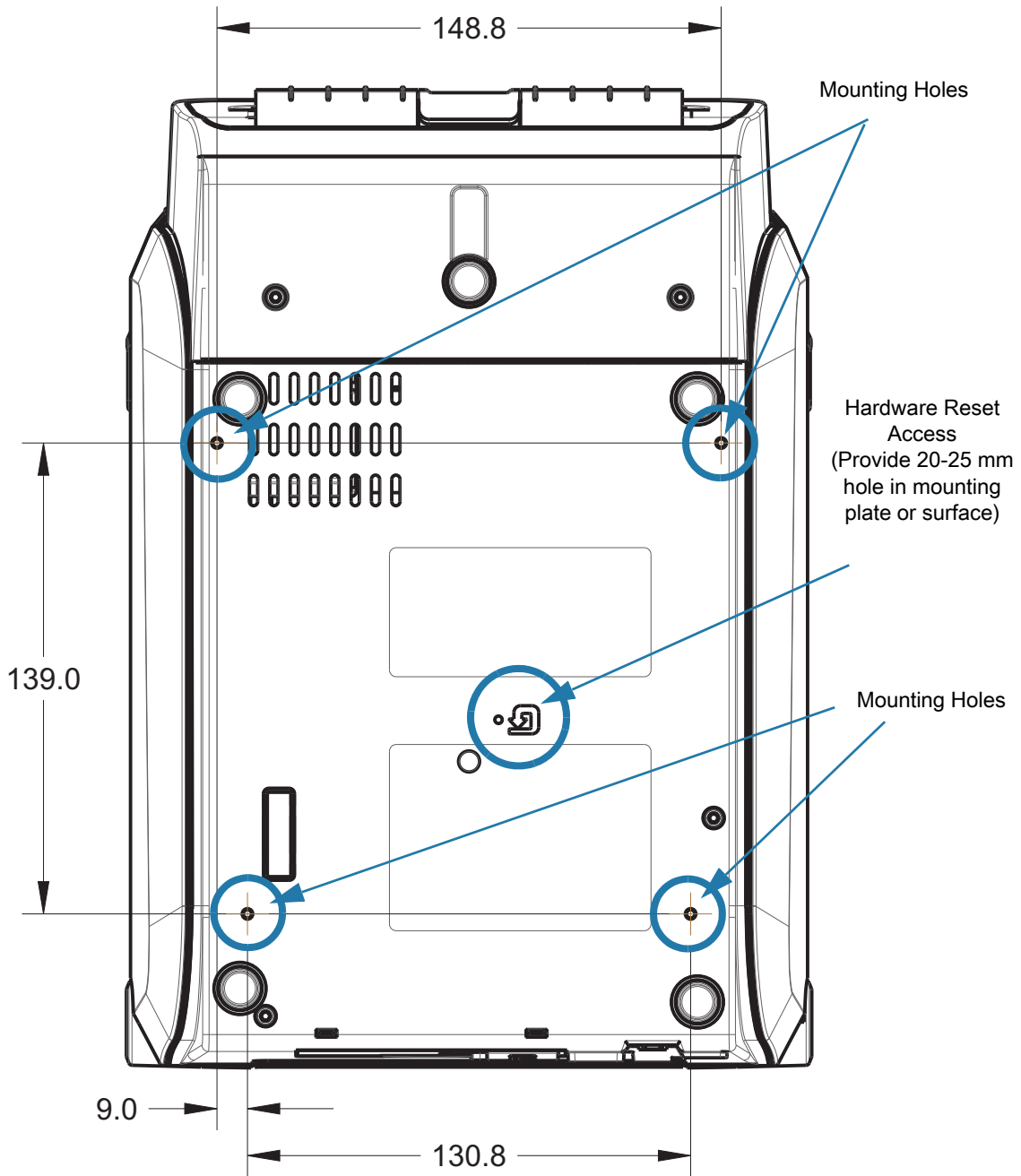


Printer with Attached Power Supply Base

ZD620 / ZD420 Thermal Transfer Models

Use M3 thread forming screws with maximum hole depth of 6 mm into the printer body.

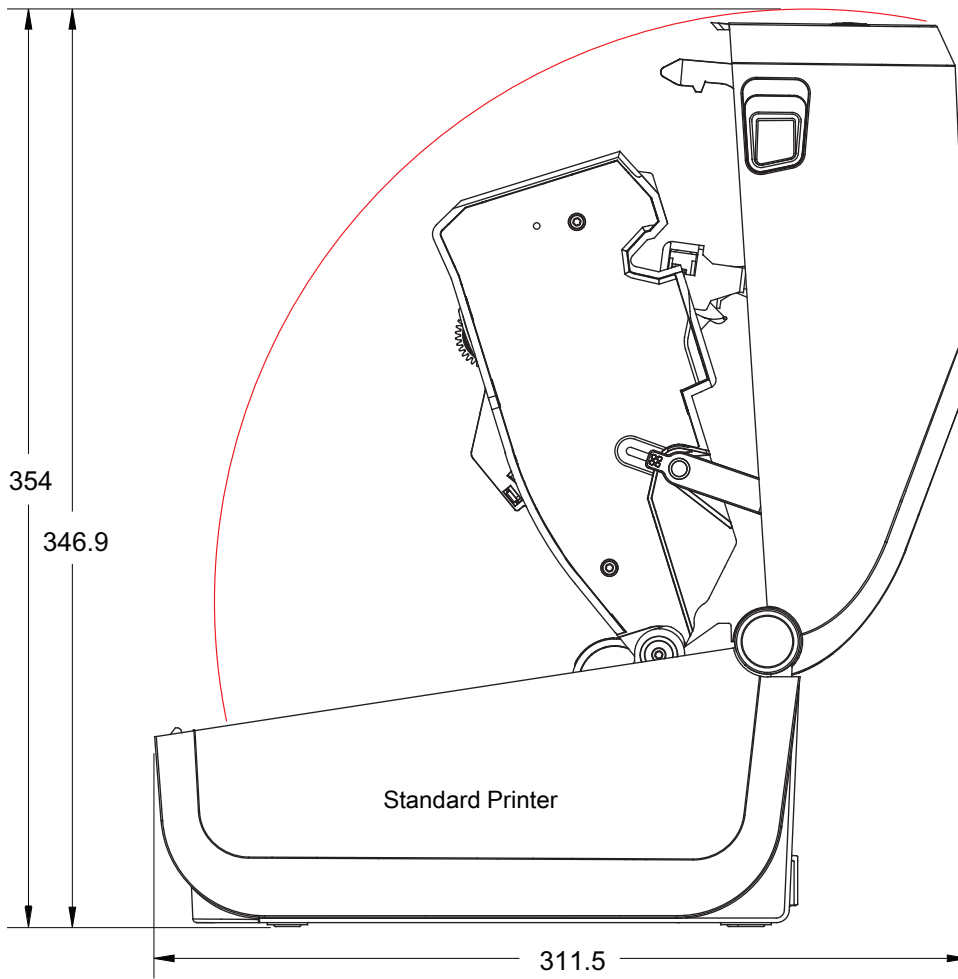
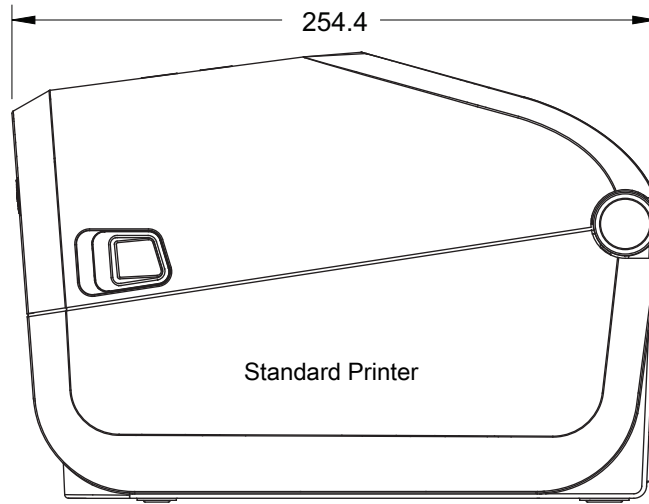
Note - Do not remove the rubber feet or the printer can overheat.



Dimensions are in millimeters (mm)

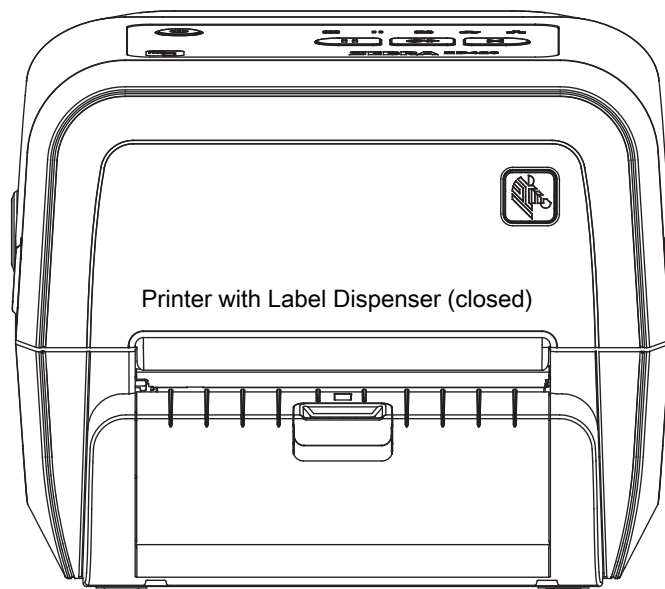
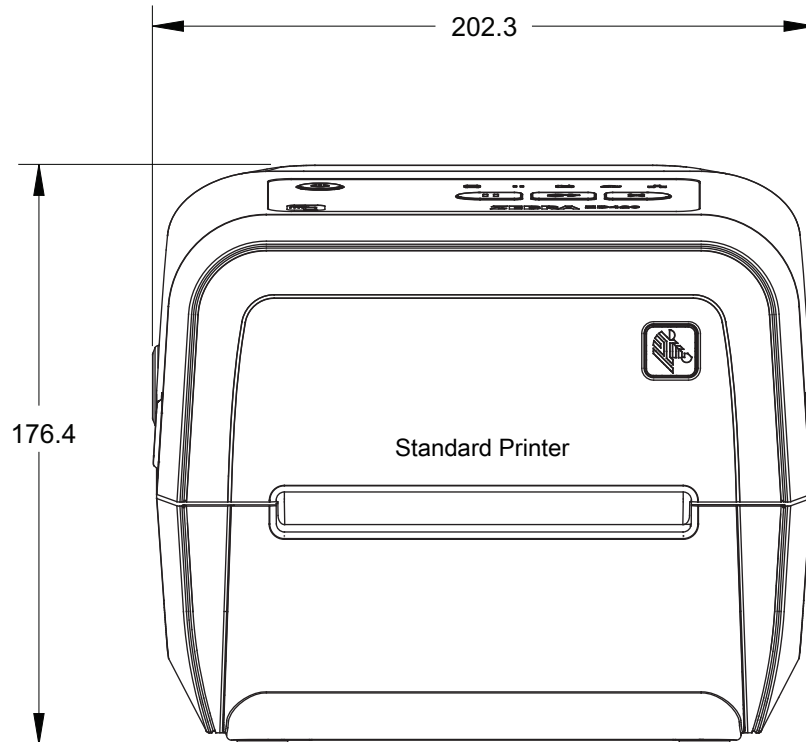
ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models

All dimension are in millimeters



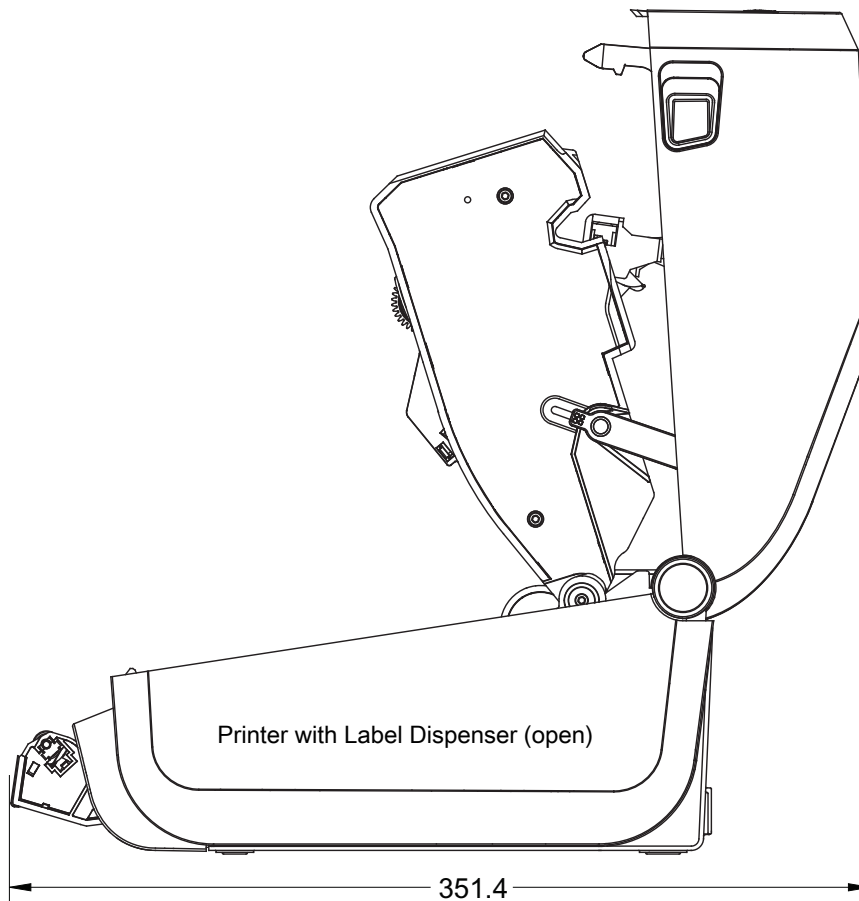
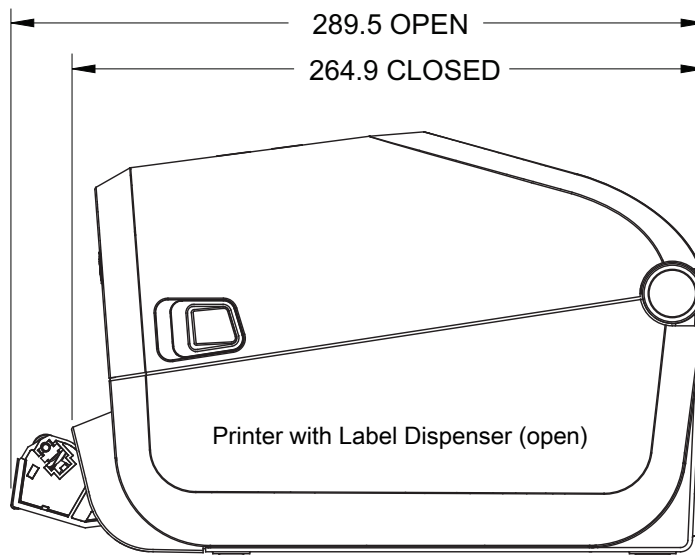
ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models

All dimension are in millimeters

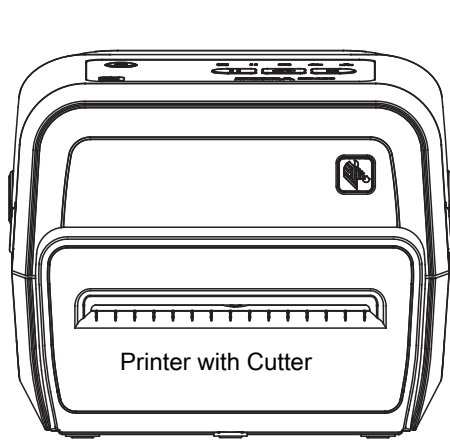
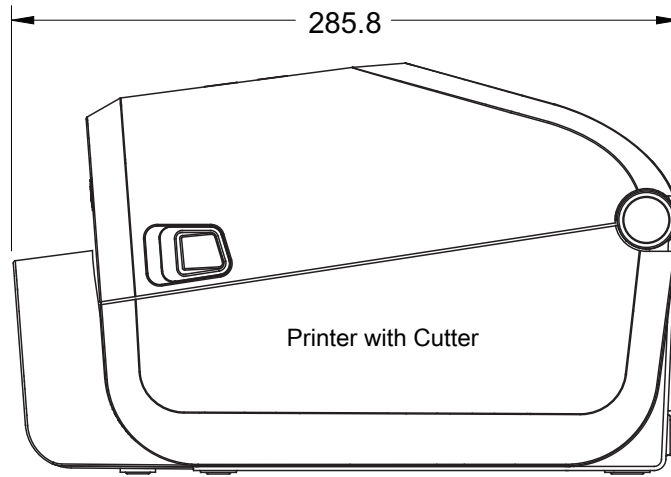


ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models

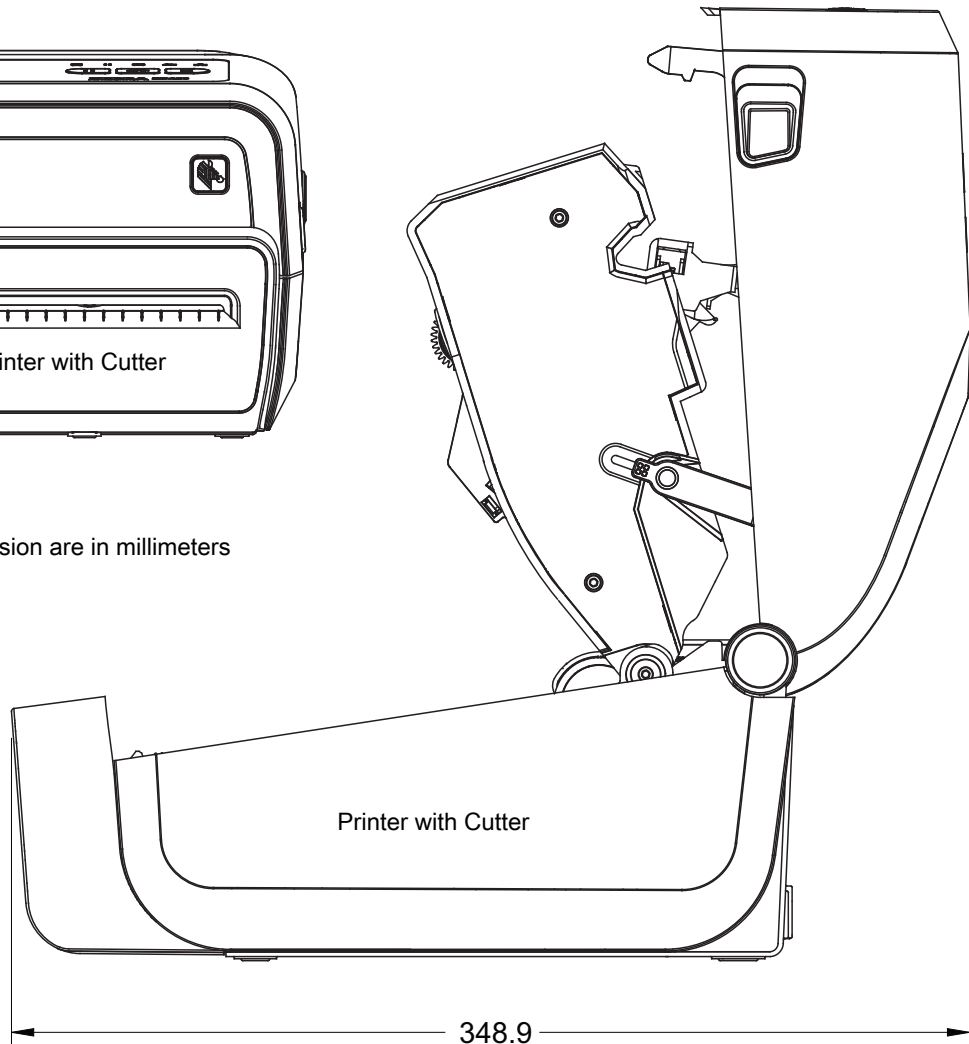
All dimension are in millimeters



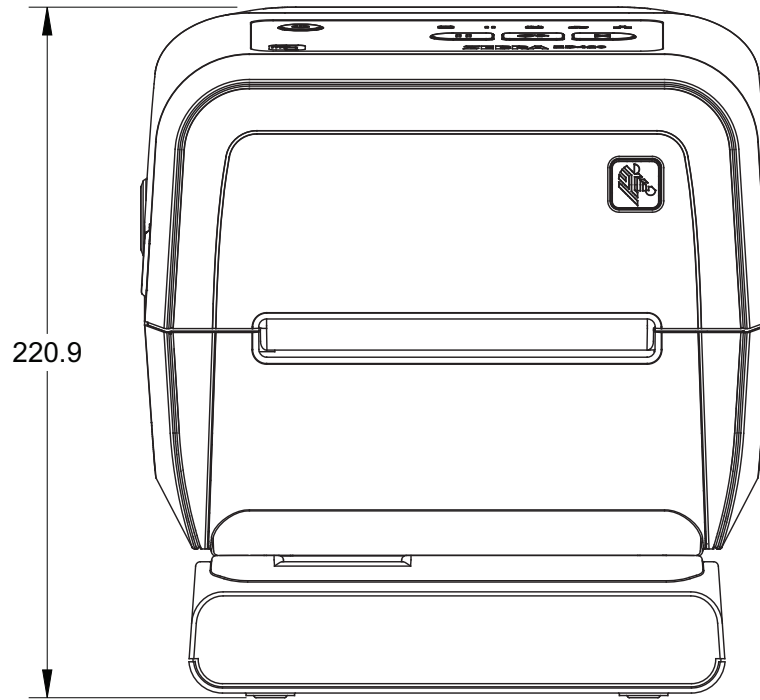
ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models



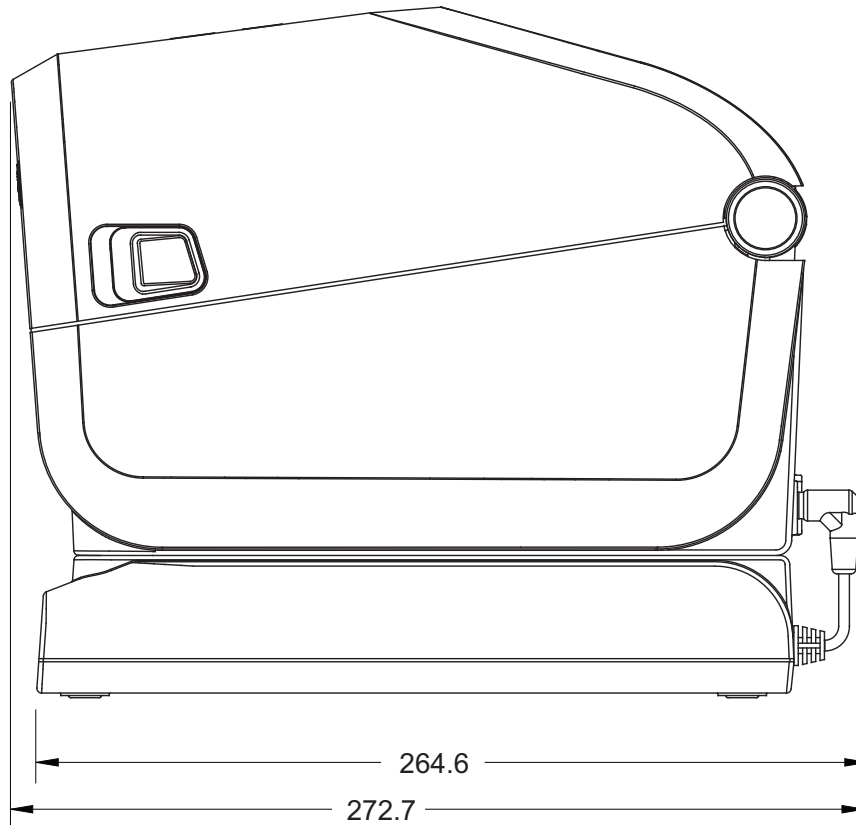
All dimension are in millimeters



ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models

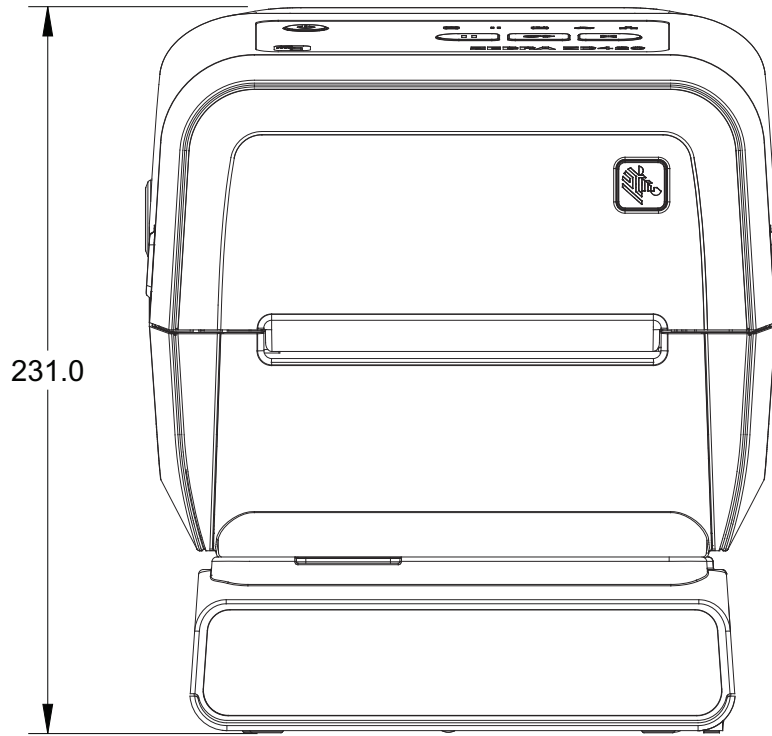


Printer with Attached Power Supply Base

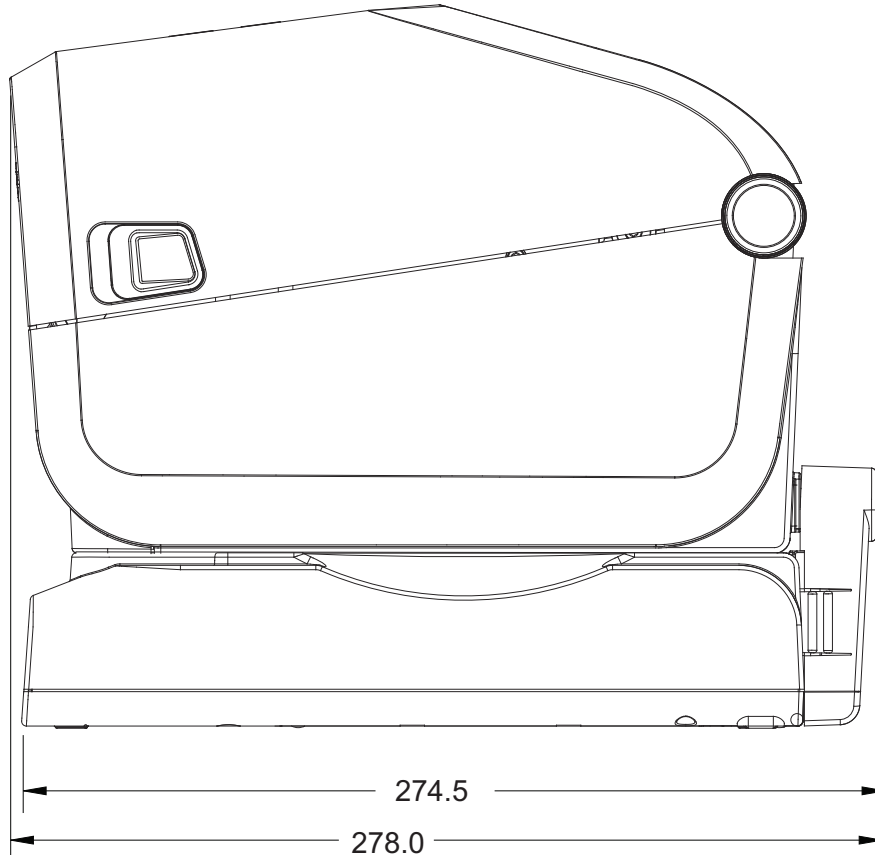


All dimension are in millimeters

ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models

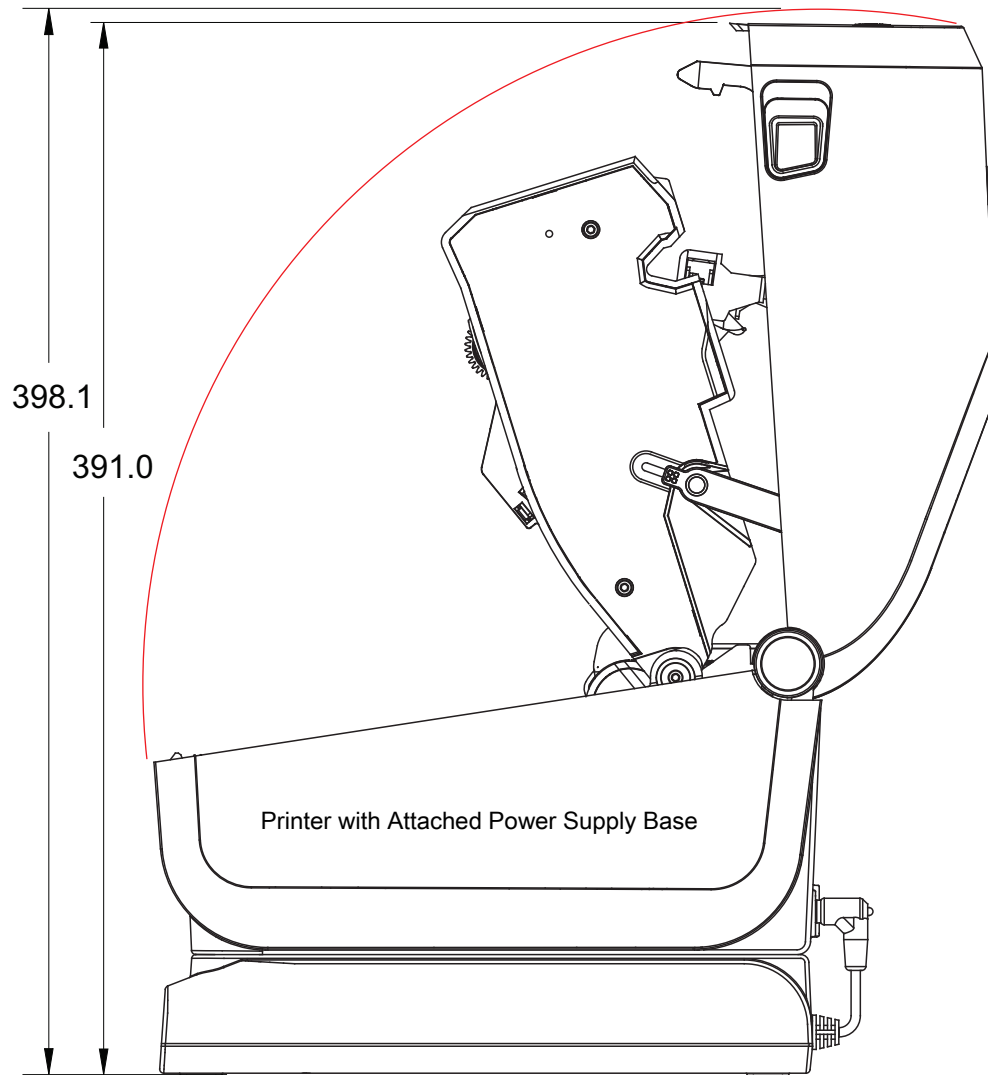


Printer with Attached Battery Base with Battery



All dimension are in millimeters

ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models

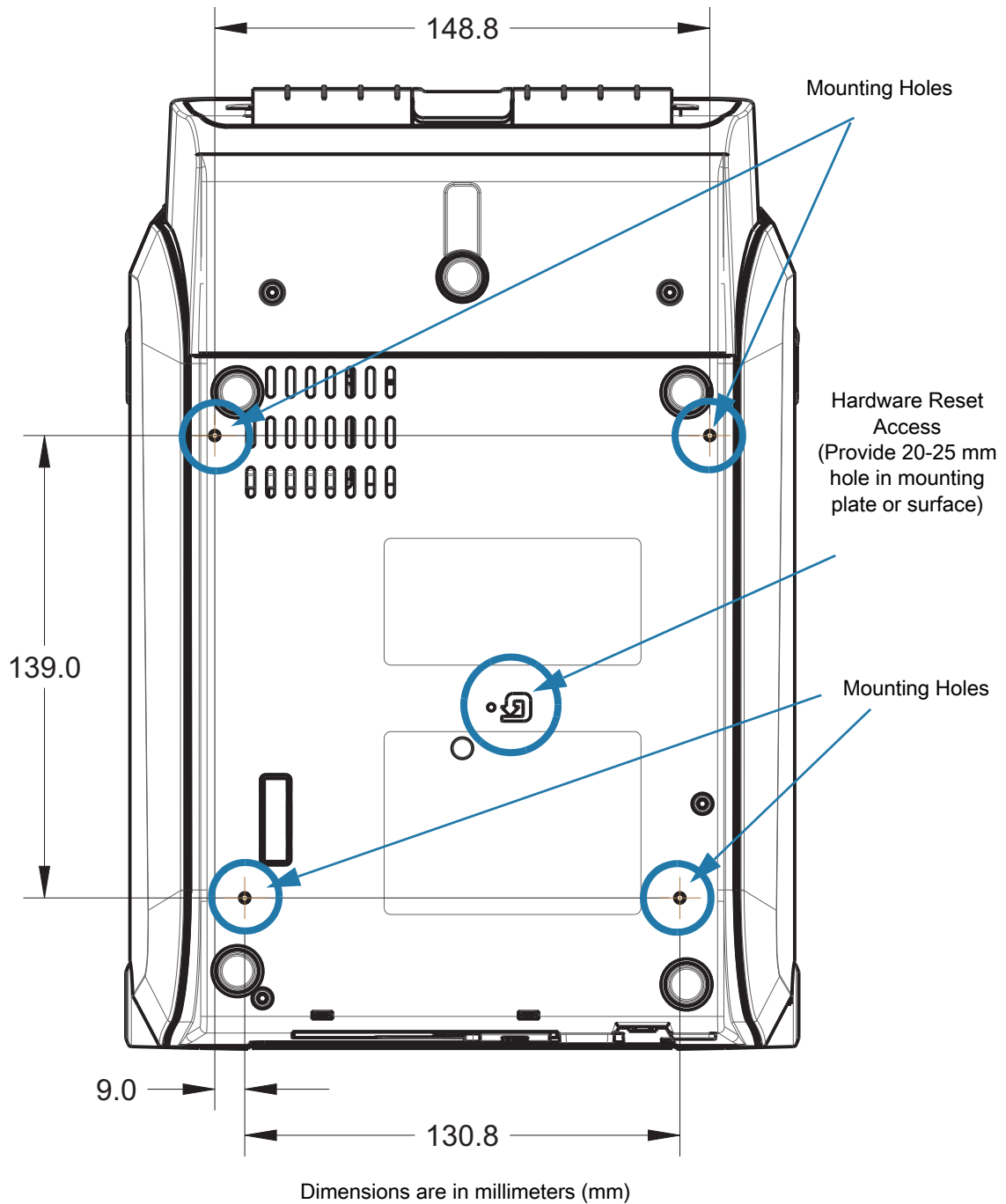


All dimension are in millimeters

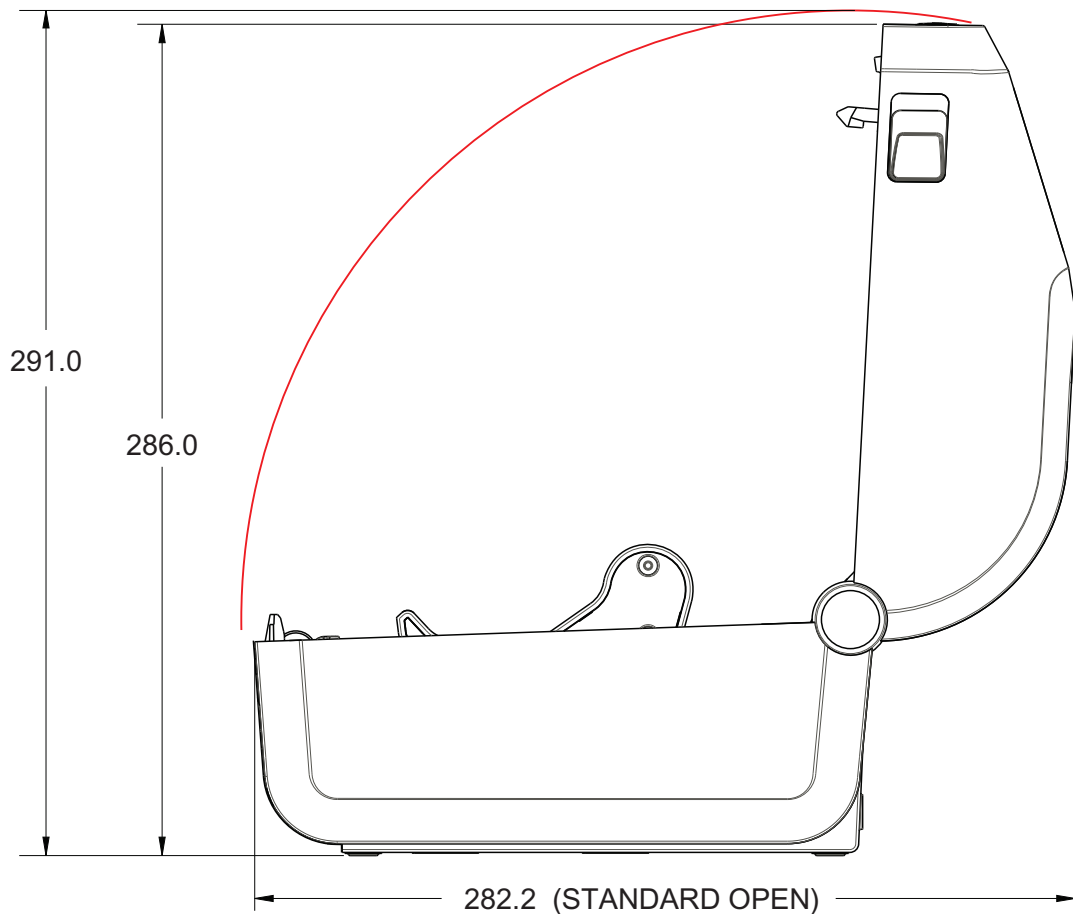
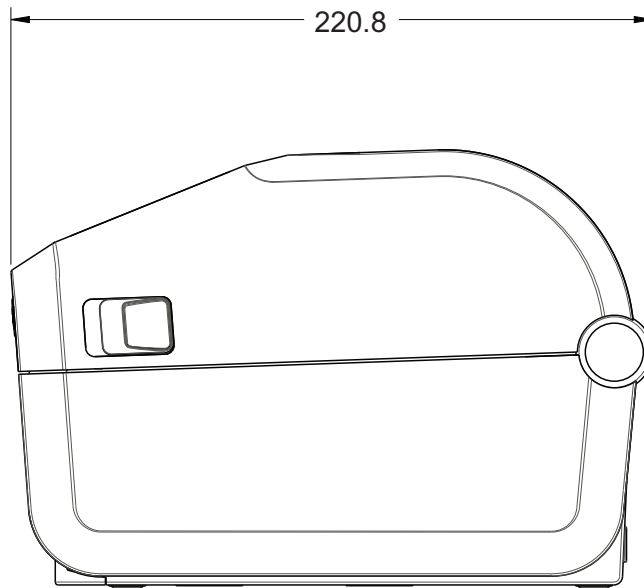
ZD620 / ZD420 Ribbon Cartridge Thermal Transfer Models

Use M3 thread forming screws with maximum hole depth of 6 mm into the printer body.

Note - Do not remove the rubber feet or the printer can overheat.

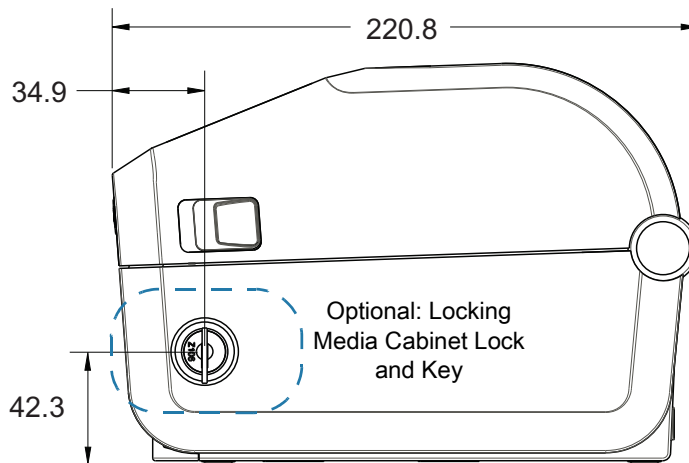
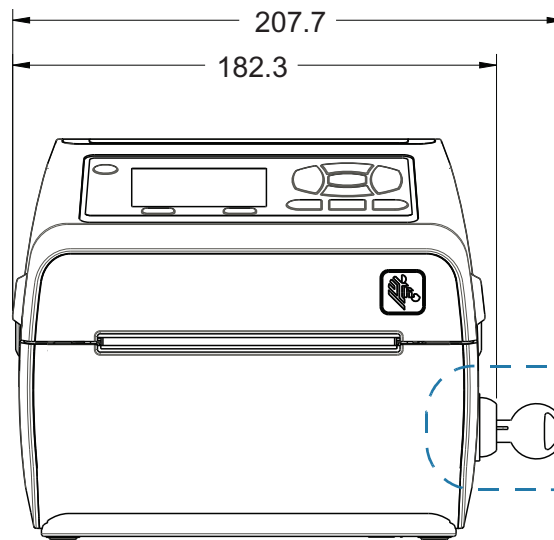
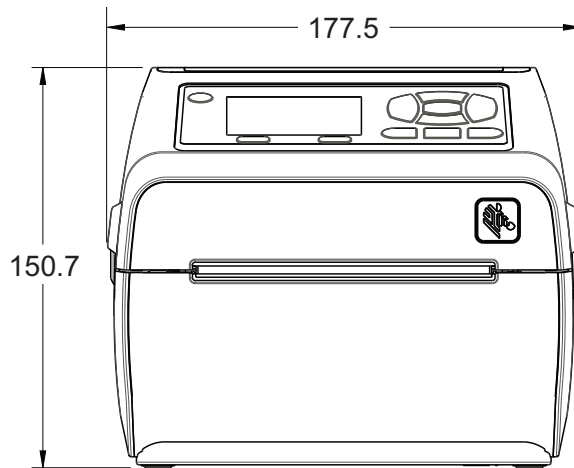


ZD620 / ZD420 Direct Thermal Models



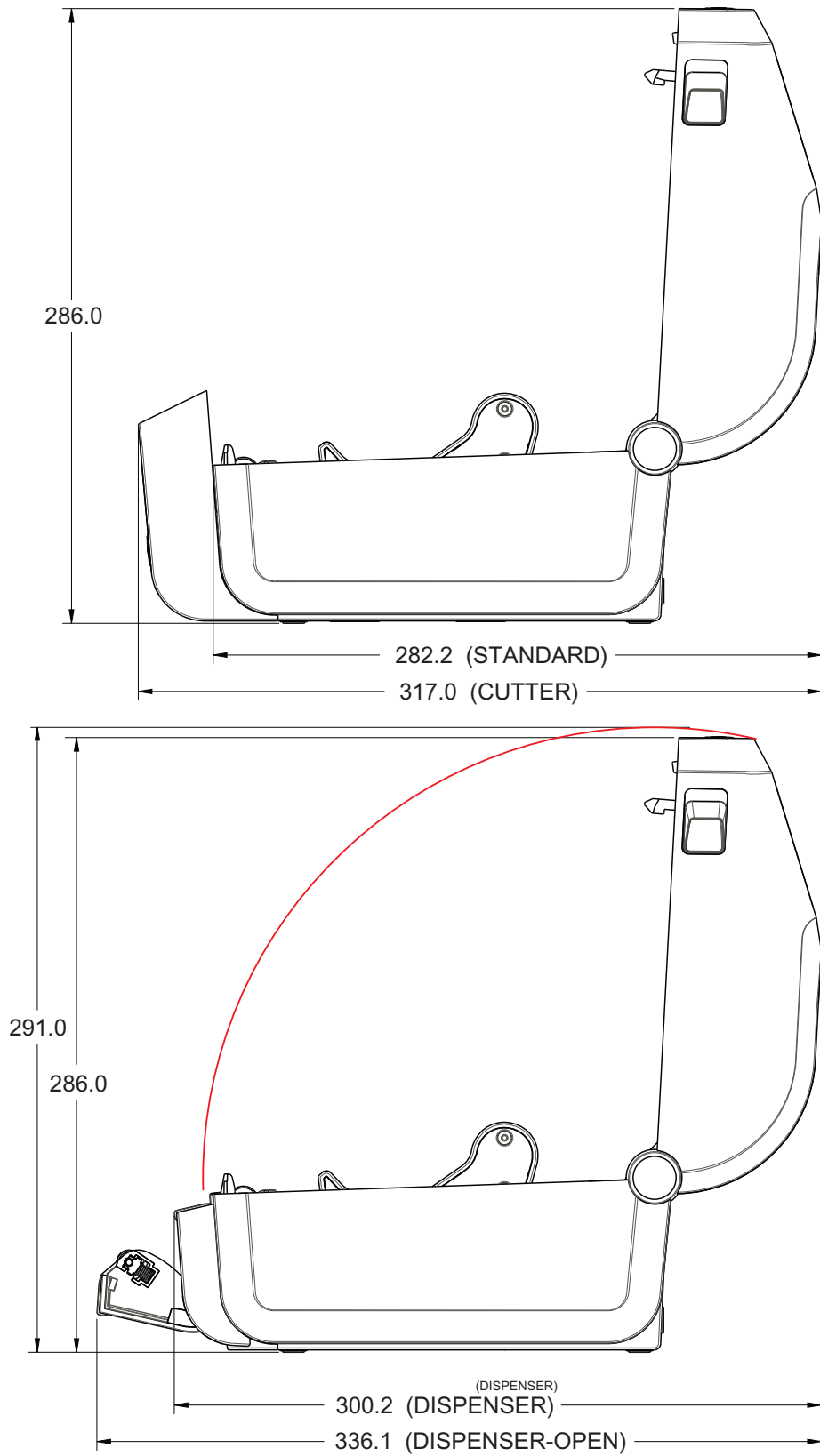
All dimension are in millimeters

ZD620 / ZD420 Direct Thermal Models



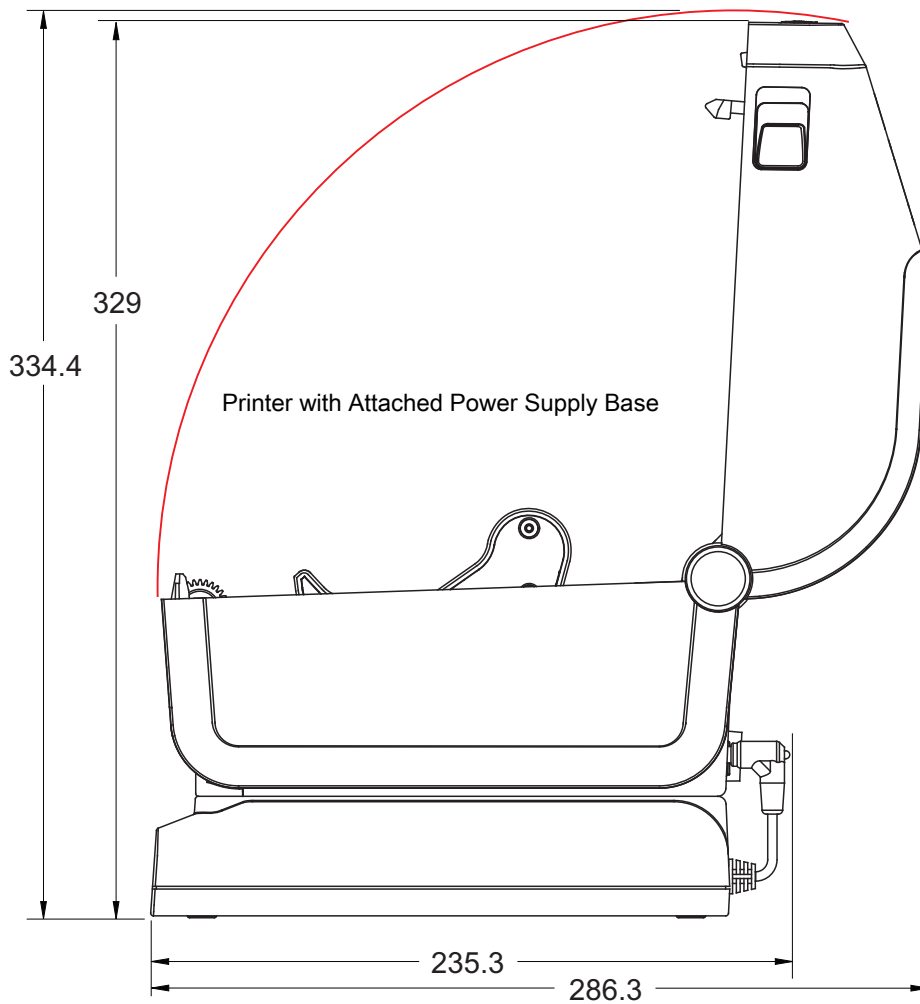
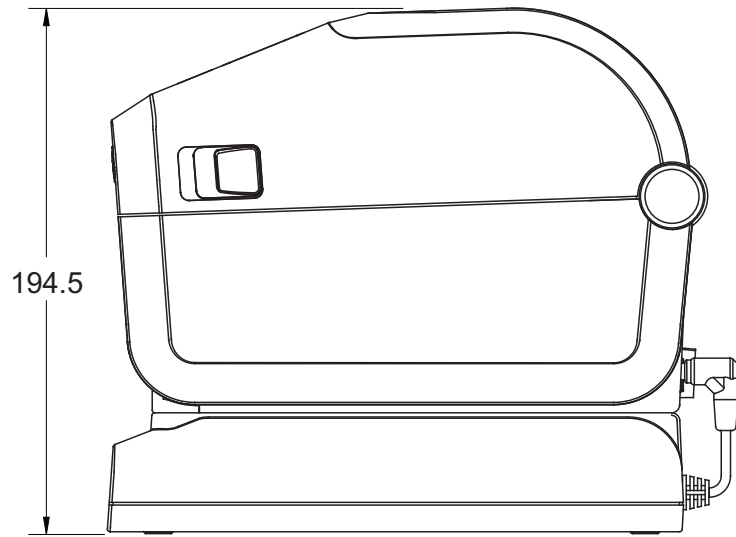
All dimension are in millimeters

ZD620 / ZD420 Direct Thermal Models



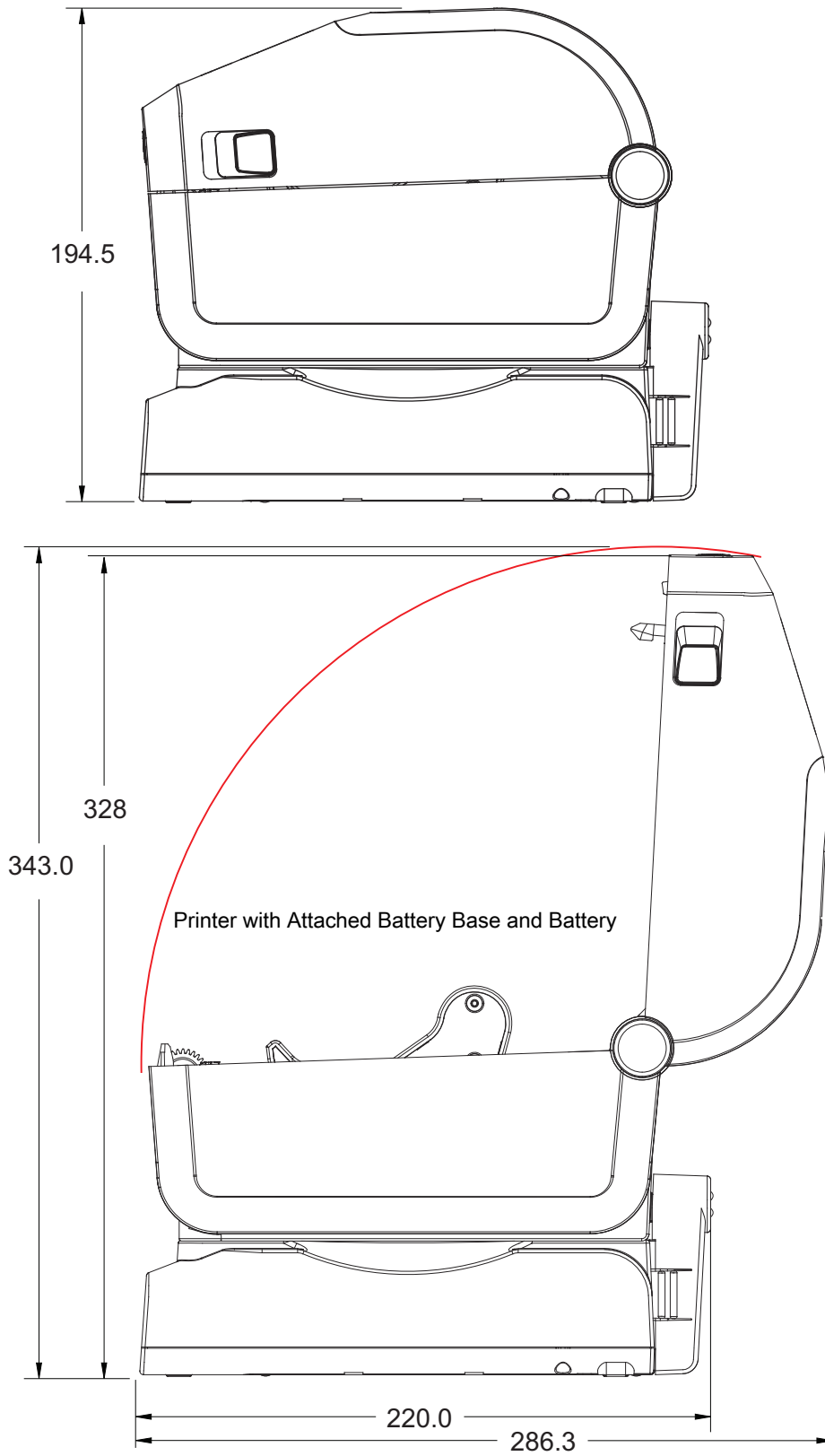
All dimension are in millimeters

ZD620 / ZD420 Direct Thermal Models



All dimension are in millimeters

ZD620 / ZD420 Direct Thermal Models

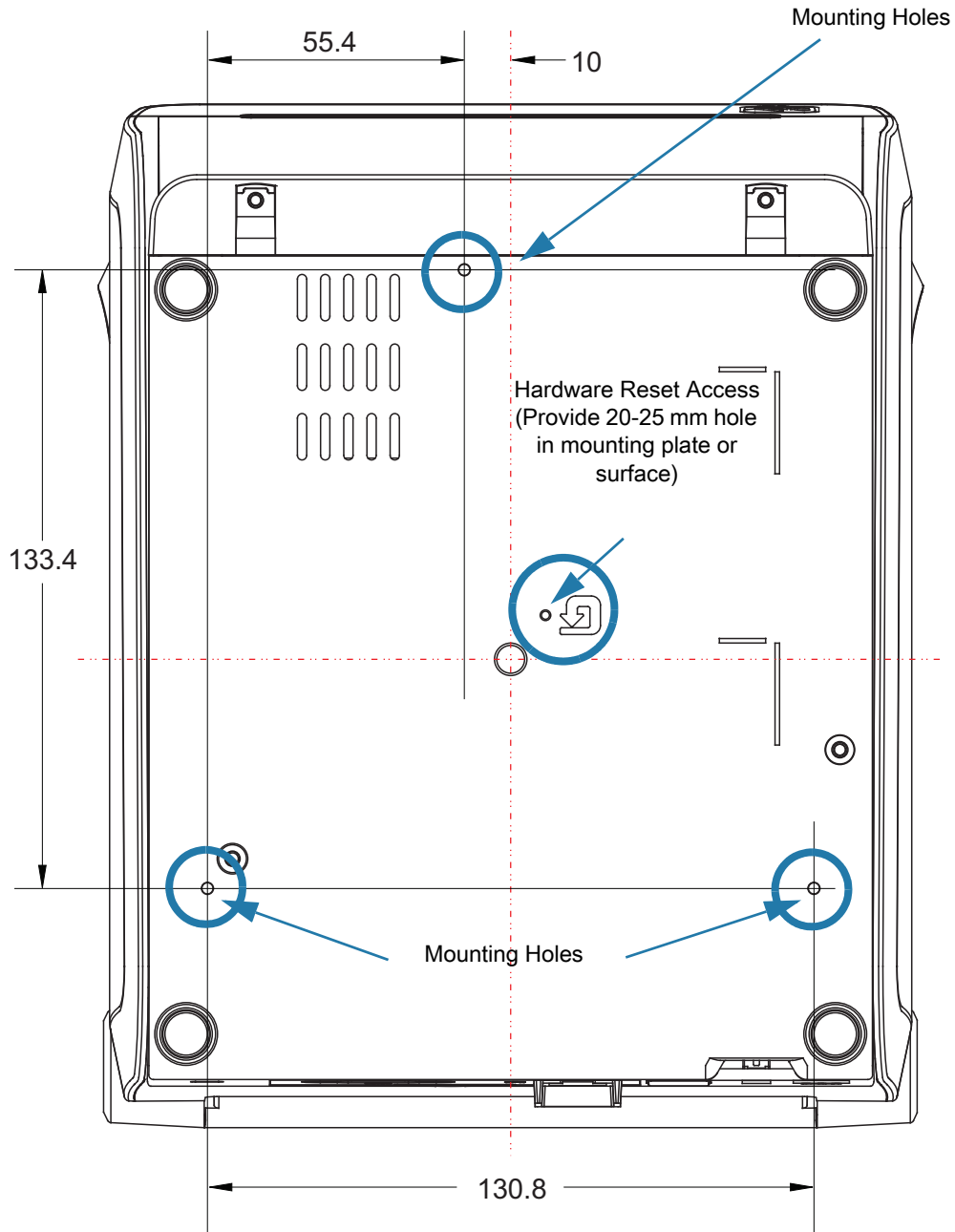


All dimension are in millimeters

ZD620 / ZD420 Direct Thermal Models

Use M3 thread forming screws with maximum hole depth of 6 mm into the printer body.

Note - Do not remove the rubber feet or the printer can overheat.



Dimensions are in millimeters (mm)

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 <http://www.zebra.com/howtobuy>.

- 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 0.0075in./0.19mm thick). Tag stock does not have adhesive or a liner, and it is typically perforated between tags.

For more information on basic media types, see [Table 3](#).

The printer typically uses roll media, but you can use fan-fold or other continuous media too.

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, complete these steps:

1. Scratch the print surface of the media with a finger nail or pen cap. Press firmly and quickly while dragging it across the media surface. Direct thermal media is chemically treated to print (expose) when heat is applied. This test method uses friction heat to expose the media.
2. Did a black mark appear on the media?

If a black mark...	Then the media is...
Appears on the media	Direct thermal. No ribbon is required.
Does not appear on the media	Thermal transfer. A ribbon is required. Not supported by this printer.

General Media and Print Specifications

- **Direct Thermal** — Max. Media width: 108mm (4.25 inches)
 - **Thermal Transfer** — Max. Media width: 118mm (4.65 inch)
 - **All Printers** — Min. Media width: 15mm (0.585 inch)
 - Media length:
 - 990mm (39 inches) max.
 - 6.35mm (0.25 inches) min. – Tear Off or Label
 - 12.7mm(0.50 inches) min. – Peel
 - 25.4mm (1.0 inch) min. - Cutter
 - Media thickness:
 - 0.06mm (0.0024 inches) min. – all requirements
 - 0.1905mm (0.0075 inches) max. – all requirements
 - Media Roll Outer Diameter (O.D.) max.: 127mm (5.0 inches)
 - Media Roll Core Inner Diameter (I.D.):
 - 12.7mm (0.5 inch) I.D. - Standard roll configuration
 - 25.4mm (1 inch) I.D. - Standard roll configuration
 - 38.1mm (1.5 inches) I.D. - with optional media roll adapter
 - 50.8mm (2.0 inches) I.D. - with optional media roll adapter
 - 76.2mm (3.0 inches) I.D. - with optional media roll adapter
 - Ribbon Rolls - 74 meter
 - Ribbon Length - 74 m (243 feet)
 - Ribbon Width Max. - 110 mm (4.33 inches)
 - Ribbon Width Min. - 33 mm (1.3 inches) ‡
 - Ribbon Core I.D. - 12.7mm (0.5 inches)
 - Wax, Wax/Resin, and Resin transfer materials
 - Ribbon Rolls - 300 meter
 - Ribbon Length - 300 m (984 feet)
 - Ribbon Width Max. - 110 mm (4.33 inches)
 - Ribbon Width Min. - 33 mm (1.3 inches) ‡
 - Wax, Wax/Resin, and Resin transfer materials
 - ZD420 Ribbon Cartridges
 - Ribbon Length - 74 m (243 feet)
 - Ribbon Width Max. - 110 mm (4.33 inches)
 - Ribbon Width Min. - 33 mm (1.3 inches) ‡
 - Colors available in Black - Wax, Wax Resin, and Resin transfer materials
- ‡ - Transfer ribbon should always cover the entire width of the media (and liner) to prevent damaging the printhead.

- Dot pitch:
 - 203 dpi: 0.125mm (0.0049 inches)
 - 300 dpi: 0.085mm (0.0033 inches)
- Barcode modulus x-dim:
 - 203 dpi: 0.005-0.050 inches
 - 300 dpi: 0.00327 - 0.03267 inches

Label Dispenser (Peeler)

The printer supports a field installed label dispense option with label taken sensor for batch processing of labels.

- Paper Thickness:
 - Min. 0.06 mm (0.0024 inches)
 - Max. 0.1905 mm (0.0075 inches)
- Media Width:
 - Min. 15 mm (0.585 inches)
 - Thermal Transfer Printers Max. 118 mm (4.65 inches)
 - Direct Thermal Printers Max. 108 mm (4.25 inches)
- Label Length:
 - All Printers Max. (theoretical): 990mm (39 inches)
 - Thermal Transfer Printers Max. (tested): 279.4mm (11 inches)
 - Direct Thermal Printers Max. (tested): 330mm (13 inches).
 - All Printers Min.: 12.7mm (0.5 inches).

Standard (Media) Cutter

The printer supports a field installed media cutter option for full width cutting of label liner, tag or receipt media.

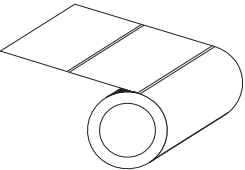
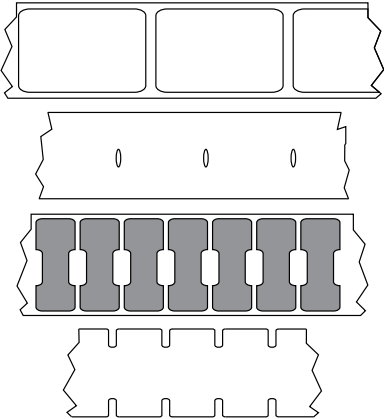
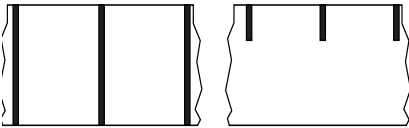
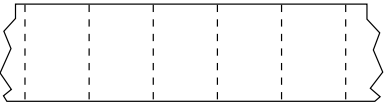
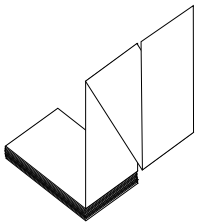
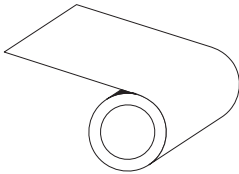
- A medium duty cutter for cutting label liner and light tag media (LINER/TAG). Do not cut through labels, adhesive or embedded circuitry.
- Paper Thickness:
 - Min. 0.06 mm (0.0024 inches)
 - Max. 0.1905 mm (0.0075 inches)
- Cut Width:
 - Min. 15 mm (0.585 inches)
 - Thermal Transfer Printers Max. 118 mm (4.65 inches)
 - Direct Thermal Printers Max. 109 mm (4.29 inches)
- Minimum distance between cuts (label length): 25.4 mm (1 inch). Cutting shorter media lengths between the cuts may cause the cutter to jam or error.
- By design, the cutter is self cleaning and does not require preventive maintenance of the internal cutter mechanism.

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 inches)
 - Max. 0.1905 mm (0.0075 inches)
- Cut Width:
 - Min. 15 mm (0.585 inches)
 - Max. 118 mm (4.65 inches)
- Minimum distance between cuts (label length): 25.4 mm (1 inch). Cutting shorter media lengths between the cuts may cause the cutter to jam or error.
- By design, the cutter is self cleaning and does not require preventive maintenance of the internal cutter mechanism. See [Linerless Platen \(Drive\) Roller cleaning](#) and [Media Path Cleaning](#) to maintain optimal linerless media cut operation.

Table 3 Types of Media Roll and Fanfold Media

Media Type	How It Looks	Description
Non-Continuous Roll Media		<p>Labels have adhesive backing that sticks them to a liner. Tags (or tickets) are separated by perforations.</p> <p>Individual labels or tags are tracked and position controlled by one or more of the following methods:</p> <ol style="list-style-type: none"> 1. Web media separates labels by gaps, holes, or notches. <div data-bbox="841 552 1222 968" style="text-align: center;">  </div> 2. Black mark media uses pre-printed black marks on the back side of the media to indicate label separations. <div data-bbox="821 1094 1227 1220" style="text-align: center;">  </div> 3. Perforated media has perforations that allow the labels or tags to be separated from each other easily in addition to position control marks, notches or label gaps. <div data-bbox="841 1377 1222 1478" style="text-align: center;">  </div>
Non-Continuous Fanfold Media		<p>Fan-Fold 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.</p> <p>This type of media uses black marks or notches to track media format positioning.</p>
Continuous Roll Media		<p>Continuous roll media does not have gaps or typically holes, notches, or black marks either 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.</p>

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 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 assist the developer. The Configuration Report lists operating parameters, sensor settings, and printer status. It can be accessed by using the procedure in [Test Printing with the Configuration Report](#). 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

Managing more than one printer can be done by creating a printer configuration programming file to send to one or more printers or ZebraNet™ Bridge can be used to clone a printer's setup. Figure 1 below shows the basic structure of a ZPL programming configuration file.

See the ZPL programmer's guide and the [Configuration Setting to Command Cross-reference](#) to create a programming file. The Zebra Setup Utility (ZSU) can be used to send programming files to the printer. Windows Notepad (text editor) can be used to create programming files.

Figure 7 • Configuration Parameter Format Structure

^XA — Start Format Command

Format Commands are order sensitive

- a) General Print and command settings
- b) Media handling and behaviors
- c) Media print size

^JUS command to save

^XZ — End Format Command

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.

Figure 8 • Configuration Report Printout

PRINTER CONFIGURATION	
Zebra Technologies ZTC ZD620-203dpi ZPL 50J164202531	
+15.0.....	DARKNESS
LOW.....	DARKNESS SWITCH
8.0 IPS.....	PRINT SPEED
+000.....	TEAR OFF ADJUST
TEAR OFF.....	PRINT MODE
CONTINUOUS.....	MEDIA TYPE
TRANSMISSIVE.....	SENSOR SELECT
DIRECT-THERMAL.....	PRINT METHOD
830.....	PRINT WIDTH
2030.....	LABEL LENGTH
39.0IN 988MM.....	MAXIMUM LENGTH
MAINT. OFF.....	EARLY WARNING
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
045.....	WEB SENSOR
096.....	MEDIA SENSOR
128.....	TAKE LABEL
062.....	MARK SENSOR
004.....	MARK MED SENSOR
046.....	TRANS GAIN
034.....	TRANS LED
049.....	MARK GAIN
100.....	MARK LED
DPCSWFXM.....	MODES ENABLED
.....	MODES DISABLED
832 8/MM FULL.....	RESOLUTION
4.0.....	LINK-OS VERSION
V84.20.07ZP37536 <-	FIRMWARE
1.3.....	XML SCHEMA
6.5.0 0.770.....	HARDWARE ID
8192k.....R:	RAM
65536k.....E:	ONBOARD FLASH
NONE.....	FORMAT CONVERT
FW VERSION.....	IDLE DISPLAY
06/08/17.....	RTC DATE
07:07.....	RTC TIME
DISABLED.....	ZBI
2.1.....	ZBI VERSION
READY.....	ZBI STATUS
178 LABELS.....	NONRESET CNTR
178 LABELS.....	RESET CNTR1
178 LABELS.....	RESET CNTR2
1,290 IN.....	NONRESET CNTR
1,290 IN.....	RESET CNTR1
1,290 IN.....	RESET CNTR2
3,277 CM.....	NONRESET CNTR
3,277 CM.....	RESET CNTR1
3,277 CM.....	RESET CNTR2
002 WIRED,SERIAL...	SLOT 1
0.....	MASS STORAGE COUNT
0.....	HID COUNT
OFF.....	USB HOST LOCK OUT
FIRMWARE IN THIS PRINTER IS COPYRIGHTED	

Sensor Settings used
for
Service Purposes

ZPL Configuration

1. ZPL Commands and Configuration Report Callout Cross-Reference

Command	Listing Name	Description
~SD	DARKNESS	Default: 10.0
-	DARKNESS SWITCH	LOW (Default), MEDIUM, or HIGH
^PR	PRINT SPEED	Default: 152.4 mm/s / 6 IPS (max.) - 203 dpi 101.6 mm/s / 4 IPS (max.) - 300 dpi
~TA	TEAR OFF	Default: +000
^MN	MEDIA TYPE	Default: GAP/NOTCH
	SENSOR SELECT	Default: AUTO (^MNA - Auto-Detect)
^MT	PRINT METHOD	THERMAL-TRANS or DIRECT-THERMAL
^PW	PRINT WIDTH	Default: 448 (dots for 203 dpi) or 640(dots for 300 dpi)
^LL	LABEL LENGTH	Default: 1225 (dots) (dynamically updated while printing)
^ML	MAXIMUM LENGTH	Default: 39.0IN 989MM
-	USB COMM.	Connection Status: Connected / Not Connected
^SCa	BAUD	Default: 9600
^SC,b	DATA BITS	Default: 8 BITS
^SC,,c	PARITY	Default: NONE
^SC,,,,e	HOST HANDSHAKE	Default: AUTO
^SC,,,,,f	PROTOCOL	Default: NONE
- SGD -**	COMMUNICATIONS	Default: NORMAL MODE
	SER COMM. MODE	Default: AUTO
^CT / ~CT	CONTROL CHAR	Default: <~> 7EH
^CC / ~CC	COMMAND CHAR	Default: <^> 5EH
^CD / ~CD	DELIM./CHAR	Default: <,> 2CH
^SZ	ZPL MODE	Default: ZPL II
- SGD -**	COMMAND OVERRIDE	Default: INACTIVE
^MFa	MEDIA POWER UP	Default: NO MOTION
^MF,b	HEAD CLOSE	Default: FEED
~JS	BACKFEED	Default: DEFAULT
^LT	LABEL TOP	Default: +000
^LS	LEFT POSITION	Default: +0000
~JD / ~JE	HEXDUMP	Default: NO (~JE)
	REPRINT MODE	Default: DISABLED

From this point in the Configuration Receipt listing, the printout has sensor settings and values displayed to troubleshoot sensor and media operations. These are typically used by Zebra Tech Support to diagnose printer problems.

** - Not supported with a ZPL command, uses the Set Get Do command in the ZPL manual. See **device.command_override.xxxxx** in the ZPL Programmer's manual.

ZPL Configuration

The configuration settings listed here resume after the **TAKE LABEL** sensor value. These listings contain printer features seldom changed from default or provide status information.

Table 4 ZPL Commands and Configuration Receipt Callout Cross-Reference

Command	Listing Name	Description
^MP	MODES ENABLED	Default: CWF (See ^MP Command)
	MODES DISABLED	Default: (nothing 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
	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 has the ability to set a command or a group of commands once for all receipts (or labels) that follow. Those settings will remain in effect until they are changed by subsequent commands, the printer is reset, or you restore factory defaults.

Printer Memory Management and Related Status Reports

To help you manage printer resources, the printer supports a variety of format commands to manage memory, transfer objects (between memory areas, import and export), object naming, and provide various printer operating status reports. They are very similar to the old DOS commands like 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 that a single command be processed within this type of format (form). A single command is easily reused as a maintenance and development tool.

^XA — Start Format Command

A Single Format Command is recommended for purposes of reuse

^XZ — End Format Command

Many of the commands that transfer objects, manage and report on memory are control (~) commands. They do not need to be within a format (form). They will be processed immediately upon receipt by the printer whether in a format (form) or not.

ZPL Programming for Memory Management

ZPL has various printer memory locations that are used to run the printer, assemble the print image, store formats (forms), graphics, fonts and configuration settings.

- ZPL treats Formats (Forms), Fonts, and Graphics like files; and memory locations like disk drives in the DOS operating system environment:
 - Memory Object Naming: Up to sixteen (16) alphanumeric characters followed by a three (3) alphanumeric character file extension, for example: **123456789ABCDEF.TTF**
Legacy ZPL printers with V60.13 firmware and earlier can only use the 8.3 file name format versus today's 16.3 file name format.
- Allows moving objects between memory locations and deleting objects.
- Supports DOS directory style file list reports as printouts or status to the host.
- Allows use of 'wild cards' (*) in file access

Table 5 Object Management and Status Report Commands

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 to formatting a disk - erases all objects from the specified memory locations B: or E:.
~JB	Reset Optional Memory	Similar to formatting a 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. Recommendation: 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.
^FL	Font Linking	Appends secondary TrueType font or fonts to the primary TrueType font to add glyphs (characters).
^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 via a font activation and installation utility. EPL fonts do not have this restriction.