ZD100DA

Direct Thermal Desktop Printer

User Guide

ZEBRA

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Copyright

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Introduction

This section introduces the Zebra ZD100da 4-inch direct thermal desktop label printers. The overview includes the printer's features, options, and what ships with your new printer.

Support information for your ZD100da Direct Thermal printer is available at zebra.com/zd100-info.

4-inch Direct Thermal Desktop Printers

The Zebra 4-inch direct thermal desktop printers are compact label printers with essential features and options.

The ZD100da printer supports the following as applicable:

- 203 dpi: maximum print speed of 152.4nn mm/sec (6 ips or inches per second) and 101.6 mm/sec (4 ips)
- ZPL Zebra printer programming language (Not including ^CN, ^CO, ~DS, ~DT, ~HB, ~HU, ~JF, ^JH, ^KN, ^KV, ~PL, ~PM, ~PN)
- EPL Zebra printer programming language (not including fB, r, TS, U%, U$, Y)

Common Desktop Printer Features

Zebra desktop printers are designed for ease of use.

Feature	Description
OpenAccess design	Simplifies media loading.
Color-coded touch points for operator controls and media guides	Makes it easy to use the printer.
Single control (**FEED**) button and a single, multicolor status indicator	
Zebra's printer operating system (OS	An open platform with software tools needed to integrate, manage, and maintain the printer.
Media roll support	• Outer Diameter (O.D.): Up to 127 mm (5 in.) • Inner Diameter (I.D.) roll cores: 12.7 mm (0.5 in.), 25.4 mm (1 in.), and an optional 38.1 mm (1.5 in.) media-core adapter set.

Feature	Description
Half-width movable media sensor	Compatibility with a wide range of media types: • Full and partial width black mark media and notched/slotted media—the printer can be set to center to the left side of media for printing. • Label gap/web media—the printer features a center-position transmissivity sensor.
Font support	• On-the-fly OpenType and TrueType font scaling and import. • Unicode • Resident scalable font (Swiss 721 Latin 1 font) • A selection of resident bitmap fonts.
Backwards-compatibility focused technology	Eases printer replacement. • Drop-in replacement of legacy Zebra desktop printers. • Accepts both EPL and ZPL programming language instructions.
Universal Serial Bus (USB) 2.0 interface	For convenient connectivity.
Zebra global printing solution	Supports the following: • Microsoft Windows keyboard encoding (and ANSI), Unicode UTF-8 and UTF-16 (Unicode Transformation Formats). • XML • ASCII (7-bit and 8-bit used by legacy programs and systems), basic single- and double-byte font encoding. • JIS and Shift-JIS (Japanese International Standards) • Hexadecimal encoding • Custom character mapping (DAT table creation, font linking, and character remapping). • For China only: Printers have the Simplified Chinese SimSun and CSong fonts pre-installed.
Minimum of 4 MB of internal (E:\) printer memory	Stores forms, fonts, and graphics.

4-Inch Desktop Printer Options

Your printer's functionality can be expanded using these options.

Feature	Description
Media core adapter kit	Includes adapters for media rolls with Outer Diameters (O.D.) up to 127 mm (5 in.), and 38.1 mm (1.5 in.) I.D. media cores.
Asian language support	Features printer configuration options for the large Simplified and Traditional Chinese, or Korean character sets.

Zebra Label-Printing Solution

Your printer is one of three components of your printing solution. To print, you will also need print media suitable for your printer and software to configure your printer for use.

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

What you need to print using your printer	Description
Compatible media	You can use direct thermal media with this printer. (Direct thermal printing does not require ribbon.) Depending on your printing needs, the media may include labels, tags, tickets, receipt paper, fanfold stacks, tamper-proof labels, etc. Use information from zebra.com/supplies or from your reseller to identify and procure media for your specific use cases.
Software • Printer drivers • Printer programming utilities • Applications (such as for label design)	Use these drivers and applications to configure and manage your printer and your print jobs from a central device such as a PC or laptop. For information on installing the drivers, see Installing the Windows Printer Drivers on page 42. You can use ZebraDesigner—a free application for Windows PC operating systems—to design simple labels and forms. It is available for download from zebra.com.

Modes of Printing

Your printer supports several modes and media configurations.

Mode	Description
Direct Thermal printing	Uses heat-sensitive media to print. (When setting this mode, use heat-sensitive media.)
Standard tear-off mode	Allows you to tear off each label or to batch-print a strip of labels and tear them off after printing.
Standalone operation	The printer can print an auto-running label format or form (programming-based) without being directly connected to another device, such as a computer.

Unpack and Inspect the Printer

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

See the support resources page for your printer at zebra.com/zd100-info for videos on how to pack and unpack your printer.

1. Save all packing materials.
2. Check all exterior surfaces for damage.

3. Open the printer (see Opening and Closing the Printer on page 7) and inspect the media compartment for loose or damaged components.
4. If you discover shipping damage upon inspecting the printer:
   a) Immediately notify the shipping company and file a damage report.

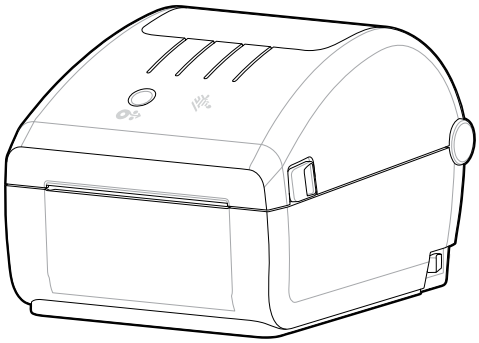
NOTE: Zebra Technologies Corporation is not responsible for any damage to the printer incurred during shipment and will not cover the repair of this damage under its warranty policy.

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

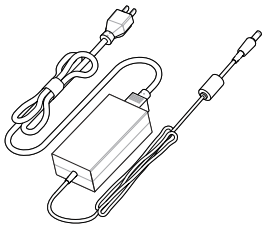
To make sure your package includes all the standard parts, see What's in the Box? on page 7.

What's in the Box?

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

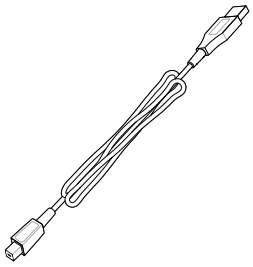


Printer



Power supply with attached power cord

Printer documentation

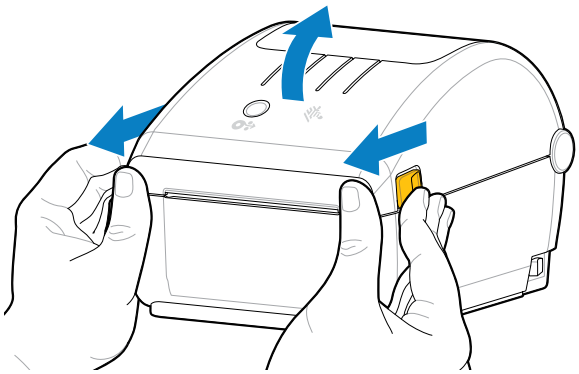


USB cable

NOTE: Print media (labels, paper, etc.) are not included. To purchase supplies, go to zebra.com/supplies.

Opening and Closing the Printer

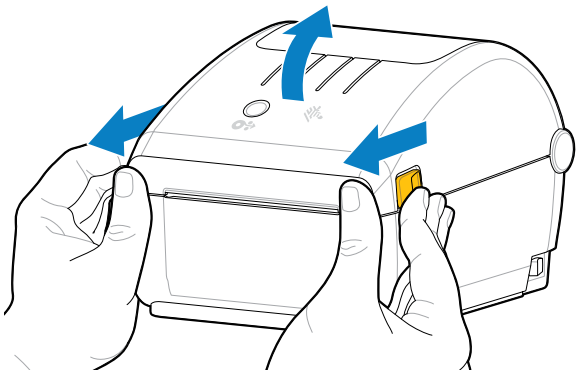
1. Pull the release latches towards you, then lift the cover.



CAUTION—ESD: The discharge of electrostatic energy—which tends to accumulate 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 and the electronic components located under the top cover.

2. To close the printer, lower the top cover, then press down in the middle of the cover (located at the front of the printer) until it snaps closed.

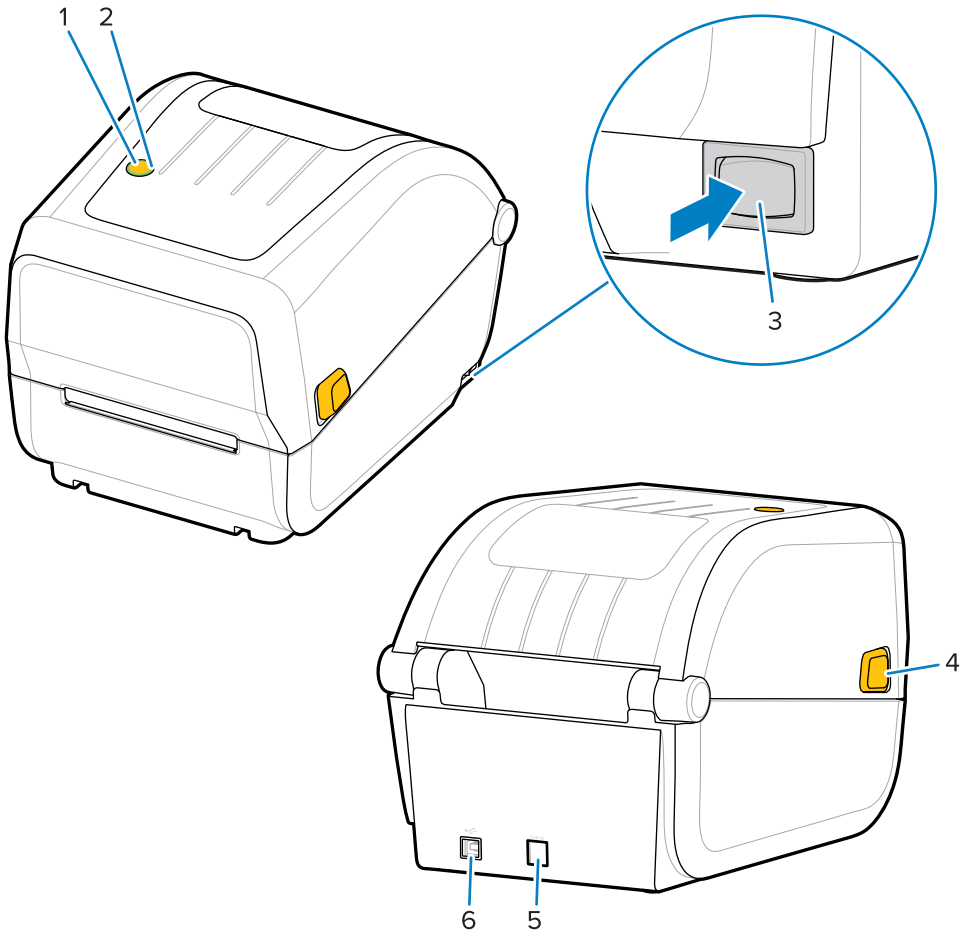


Printer Features

This section will help you identify the external and internal features of your printer.

For more information about your printer, see zebra.com/zd100-info.

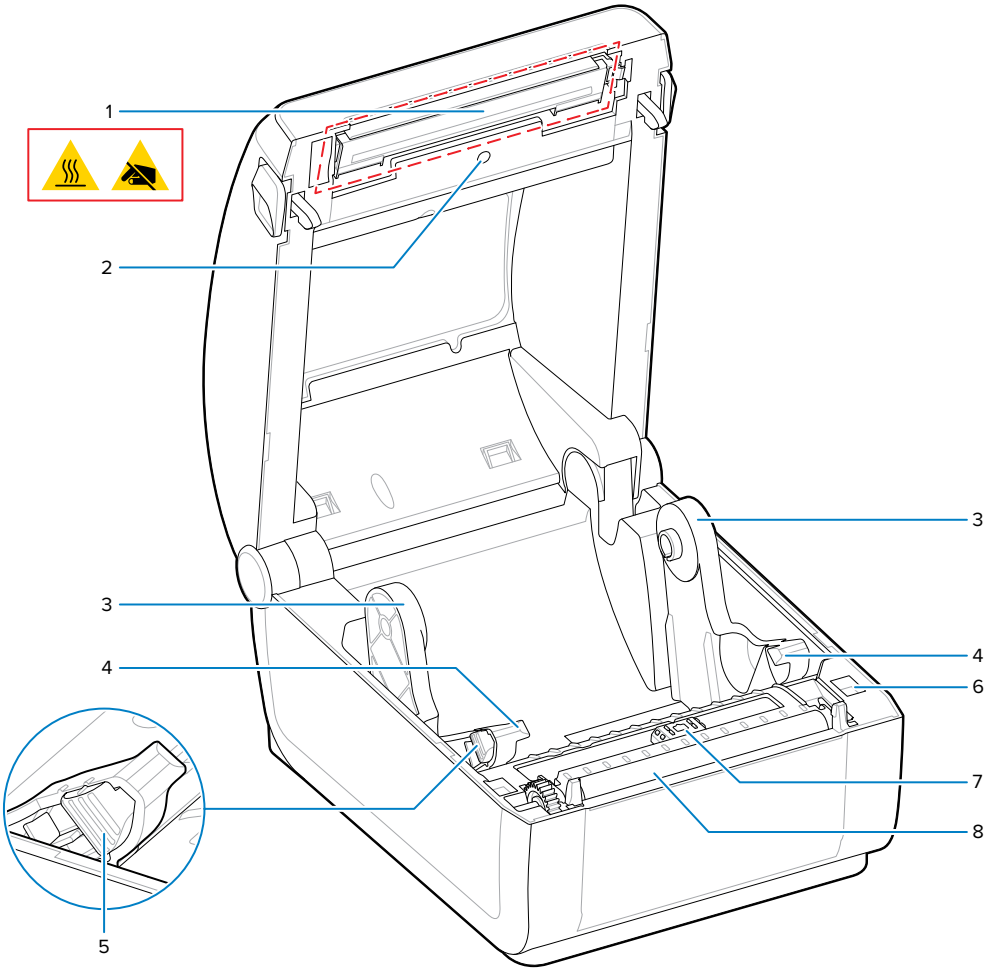
Exterior Features



1	FEED button (see FEED (Advance) Button on page 15)

2	Status indicator (see Status Indicator on page 14)
3	POWER button (see POWER Button on page 14)
4	Release latch
5	DC power receptacle
6	Interface access

Interior Features



1	Printhead
2	Upper web (gap) sensor
3	Roll holders
4	Media guides
5	Media guide stop
6	Head-up sensor (inside)

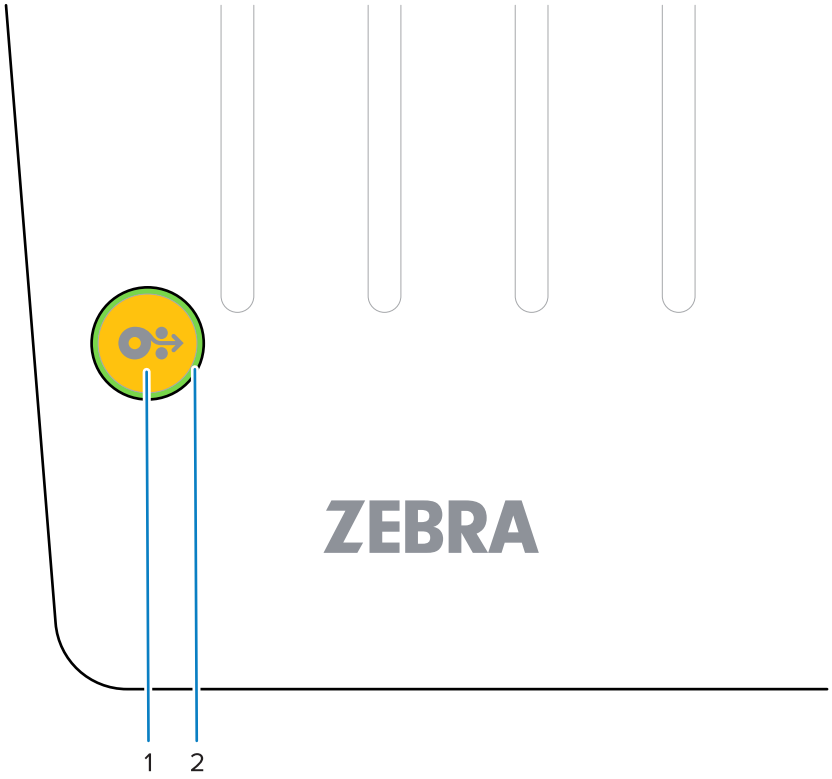
7	Moveable sensor (black mark and lower web/gap)
8	Platen (drive) roller

Controls and Indicators

The user controls are located at the top and toward the front of the printer. Use this interface to perform basic printer control functions and to determine printer status.

User Interface

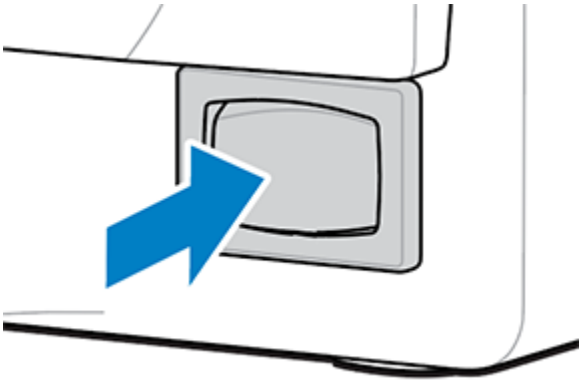
Your printer's user interface is designed to help you with a variety of routine tasks.



	Interface control	Description
1	Feed button  Single multi-functional **FEED** (Advance) button (for more information, see FEED (Advance) Button on page 15)	The **Power** button and the **FEED** button—individually or in combination, and along with information shown by the STATUS indicator—are designed to help you perform a range of routine printer tasks which include: • Calibrating the media (labels, paper, tags, etc.) • Printing a configuration report • Resetting printer settings to their defaults • Entering 'Forced' firmware download mode • Entering and exiting diagnostic (DUMP) mode to debug printer programming and communications **NOTE:** This button is modal—what happens when you press the buttons depends on what the printer is doing at the time.
2	Status indicator (tricolor, encircles the **FEED** button) See Status Indicator on page 14 for information on how to interpret the Status Indicator state and color.	Indicates the printer's operating status and a range of conditions using state and color (such as when the printer runs out of media). The state of the indicator can be: • On (lit) • Off (not lit) • Blinking (off and on) and alternating between colors in a variety of patterns The color can be: • Green—ready or functioning • Amber (orange/yellow)—for busy or active processes (boot-up, over-temperature cooling cycle, etc.). • Red—needs attention

POWER Button

This button turns the printer power ON and OFF.



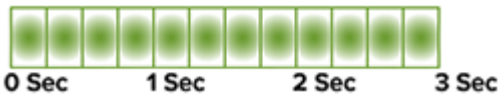
Power ON	Press the POWER button (located on the right rear of the printer). • The printer will power up. • The STATUS Indicator light turns amber when the printer performs self-diagnostics, configuration checks, and integration of optional components. This process will take several seconds to complete. • The STATUS Indicator will turn solid green—or flashing green— indicating the printer is ready for normal print operations.
Power OFF / Shutdown	Press the POWER button (on the right rear of the printer). The printer will turn OFF.

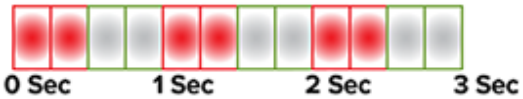
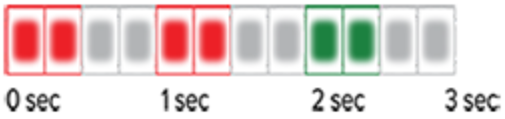
Status Indicator

The STATUS indicator provides information about the printer's basic health and operational status, including powered-up and powered-down states.

The STATUS indicator encircles the **FEED** button.

Familiarize yourself with these printer indicator conditions and what they mean:

This condition...	Indicates...
Green  	The printer is READY for print and data activity.
Flashing Green  	Normal Operation—Printer may be COMMUNICATING or PROCESSING data.

This condition...	Indicates...
Double Flashing Green—two short flashes followed by one long flash 	The printer is PAUSED.
Flashing Red 	Media Alert—The printer is: • open • out of media (ribbon, paper, labels, tags, etc.) • unable to sense the loaded media
Flashing Amber 	Over Temp—The printhead is over temperature and must cool to resume printing.
	Critical Over Temp—The printhead has failed.

For information on how to interpret and troubleshoot error conditions, see Troubleshooting on page 68.

FEED (Advance) Button

The **FEED** button is a multi-function button used to feed labels, reprint the last label, pause printing, and return the printer to normal operation after a pause.

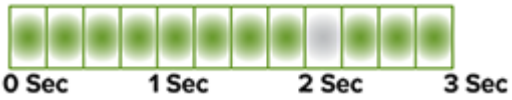
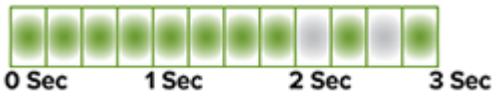
Feed one label	To advance the media by one blank form or format (one label, receipt, tag, ticket, etc.), wait for the printer to stop printing. Press the **FEED** button, and release it within two seconds.
Reprint last label	To activate the Enable Reprint feature, send the printer an SGD command (`ezpl.reprint_mode` OR the ZPL `^JJ` command parameters `D` and `E`), then use the **FEED** button as the 'applicator signal'. This enables a reprint of a failed media print. If the printer runs out of media (paper, labels, etc.), it can reprint the last label (print form/format) from its print storage buffer as described above. **NOTE:** Do NOT turn printer power off or reset the printer if you want to reprint. These actions clear the print buffer.

Stop print activities and place the printer into a PAUSE state	Press the **FEED** button while printing. The printer will finish printing the label it is printing before it enters a PAUSE state.
Return the printer to normal operation after the first three actions above	Press the **FEED** button while in the PAUSE state. If the printer is printing a multi-label (form/format) job or if another job is waiting in the print queue, the printer will resume printing.
Initialize **FEED** button modes	You can access these advanced-operation **FEED** button modes by pressing the button for longer than two seconds. (See FEED Button Modes – Power ON on page 16 and FEED Button Modes – Power OFF on page 17.)

FEED Button Modes – Power ON

This is the first of two advanced function sets accessible through the operation of the **FEED** button. (The other is **FEED** Button Mode - Power OFF.) By noting changes in the state and color of the STATUS indicator light — specifically the patterns of these changes — you can access the Power ON modes used to configure and set up the printer.

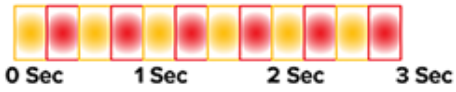
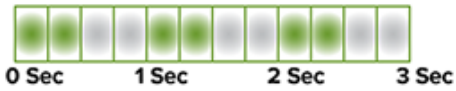
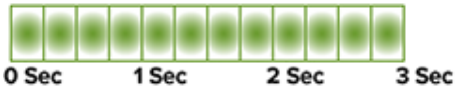
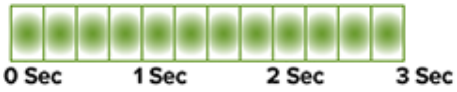
To access advanced operation Power ON modes, ensure the printer is ON and ready to print (STATUS indicator is lit up green). Then follow these instructions:

To...	Press and hold the FEED button for two seconds, then immediately release it and follow these instructions:	Result
Print a configuration report...	 Wait for one flash of the STATUS indicator, then release the **FEED** button.	The printer prints a Configuration Report and exits Advanced Mode.
Calibrate the installed media (labels, paper, tags, etc.) using the Smart Cal routine and set the media-sensing parameters...	 Continue holding the **FEED** button until the STATUS indicator flashes two times, then release the button.	The printer begins measuring media, sets the start of the media position, and exits Advanced mode.
Reset the printer to factory defaults...	 Continue holding the **FEED** button until the STATUS indicator flashes three times, then release the button.	The printer resets to factory defaults (same result as after issuing the ZPL ^JUN command) and exits Advanced mode.
Return the printer to normal operating mode...	Release the **FEED** button two or more seconds after the third flash sequence.	The printer exits Advanced mode and returns to normal operating mode.

FEED Button Modes – Power OFF

This is the second of two advanced function sets of the **FEED** button. (The other is **FEED** Button Mode – Power ON.) By noting changes in the state and color of the STATUS indicator light — specifically the patterns of these changes — you can use the Power OFF modes to update and troubleshoot the printer.

To access the advanced operation Power OFF options, ensure the printer is turned ON and a roll of media is loaded. Then follow these instructions:

To...	Press and hold the FEED button and follow these instructions:	Result
Enter Forced Download mode...	Wait until the STATUS indicator alternates between amber and red, then release the **FEED** button.  Waiting  Data transferring  Booting up  Ready – Firmware updated	The printer waits for data to begin downloading the printer firmware file. **NOTE:** Your printer firmware may be configured to calibrate to the installed media and print a Configuration Report.
Boot up the printer in normal mode...	Continue holding the **FEED** button for three seconds, then release the button when the STATUS indicator turns amber.  Booting up  Ready	The printer boots up normally.

To...	Press and hold the FEED button and follow these instructions:	Result

Enter Data Diagnostics Mode...	Continue holding the **FEED** button for at least three seconds before releasing it.	The printer boots up into Diagnostic (Hex Data Dump) mode and prints the following:
		
		`**********`
		`* Entering Diag Mode *`
		`**********`
		
		See Diagnosing Communication Issues on page 75.

To return to Normal Operating mode...	Two or more seconds after leaving Data Diagnostic Mode (as discussed above), release the **FEED** button. Alternatively, after the STATUS indicator turns green, hold the **FEED** button down for five or more seconds.	The printer returns to normal operating mode.

Setup

The printer setup process is comprised of two phases: hardware setup and host system (software/driver) setup. This section covers how to set up the physical hardware setup to print your first label.

Setting Up the Printer (Process Overview)

This process overview provides general information, with detailed steps in other sections.

1. Place the printer in a safe location with access to power and where you can connect interface cables or wirelessly to the system. See Select a Location for the Printer on page 19.
2. Attach the printer and power supply to a grounded AC power source.
3. Select and prepare media for your printer (see Media on page 82).
4. Load the media (see Loading the Media on page 24).
5. Turn the printer power ON (see POWER Button on page 14).
6. Run a SmartCal Media calibration to calibrate the printer to the media (see Running a SmartCal Media Calibration on page 30).
7. Print a Configuration Report to verify basic printer operation (see Test Printing with the Configuration Report on page 31).
8. Turn printer power OFF.
9. Set up the USB port wired connection.
10. If using a physical connection, attach the printer cable to the network or host system with printer power OFF.

NOTE: Wait to turn the printer power ON. Install the drivers first using the Zebra Setup Utilities (see Setup for Windows OS on page 42 for details). The setup utility will prompt you to turn the printer power ON at the appropriate point in the setup process. If you connected the central device to the printer and turned the printer power ON before installing the drivers, see What To Do If You Forget to Install the Printer Drivers First.

11. Begin the second phase of the printer setup, typically Setup for Windows OS on page 42.

Select a Location for the Printer

For optimal print operations, ensure that the printer and media location is clean with moderate temperatures.

Select a location for the printer that meets these conditions.

Condition	Description
Surface	Must be solid, level, and of sufficient size and strength to hold the printer with media.
Space	The operating location for the printer must include enough space to open the printer (for media access and cleaning) and enable access to connectivity and power cords. Leave open space on all sides of the printer to allow for proper ventilation and cooling. **IMPORTANT:** Do not place any padding or cushioning material under or around the base of the printer, as this will restrict airflow and could cause the printer to overheat.
Power	Situate the printer within easy access of a power outlet.
Data communication interfaces	Ensure that cabling does NOT exceed the maximum distance specified by the communication protocol standard or product data sheet for this printer.
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: 5°C to 41°C (40°F to 105°F) • Operational humidity: 10% to 90% non-condensing • Non-operational temperature: -40°C to 60°C (-40°F to 140°F) • Non-operational humidity: 5% to 85% non-condensing

Attaching Power

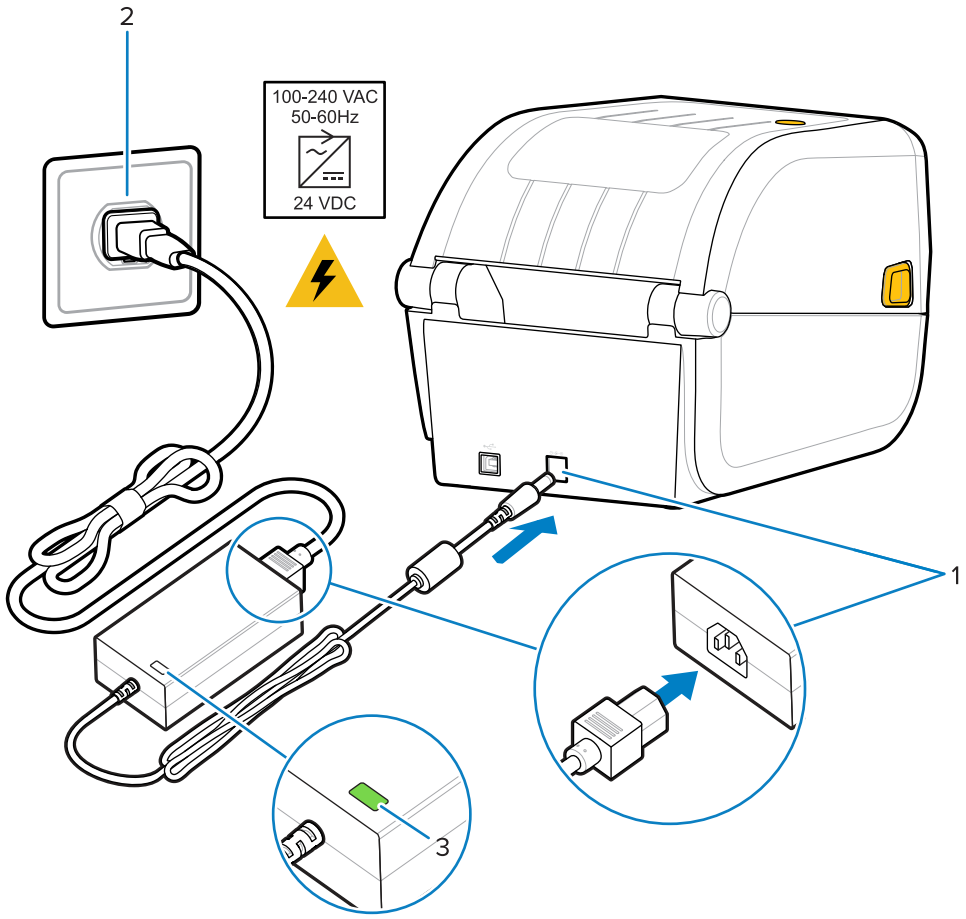
Follow these instructions to connect the power cord and power supply to the printer.

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

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

NOTE: Set up your printer so that you can handle the power cord easily if needed. Some setup or troubleshooting tasks may instruct you to switch printer power OFF. 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. Plug the other end of the AC power cord into an appropriate AC electrical outlet. (The AC-outlet end of the power cord's plug type can vary by region.)
3. The active power light will turn on green if power is on at the AC outlet.



Media Preparation for Printing

Purchase media that will suit your printing needs. Media does not ship with the printer.

You can use labels, tags, tickets, receipt paper, fanfold stacks, tamper-proof labels or other print media formats. Use the Zebra website, or your reseller may be able to help you select the right media for your intended printing application.

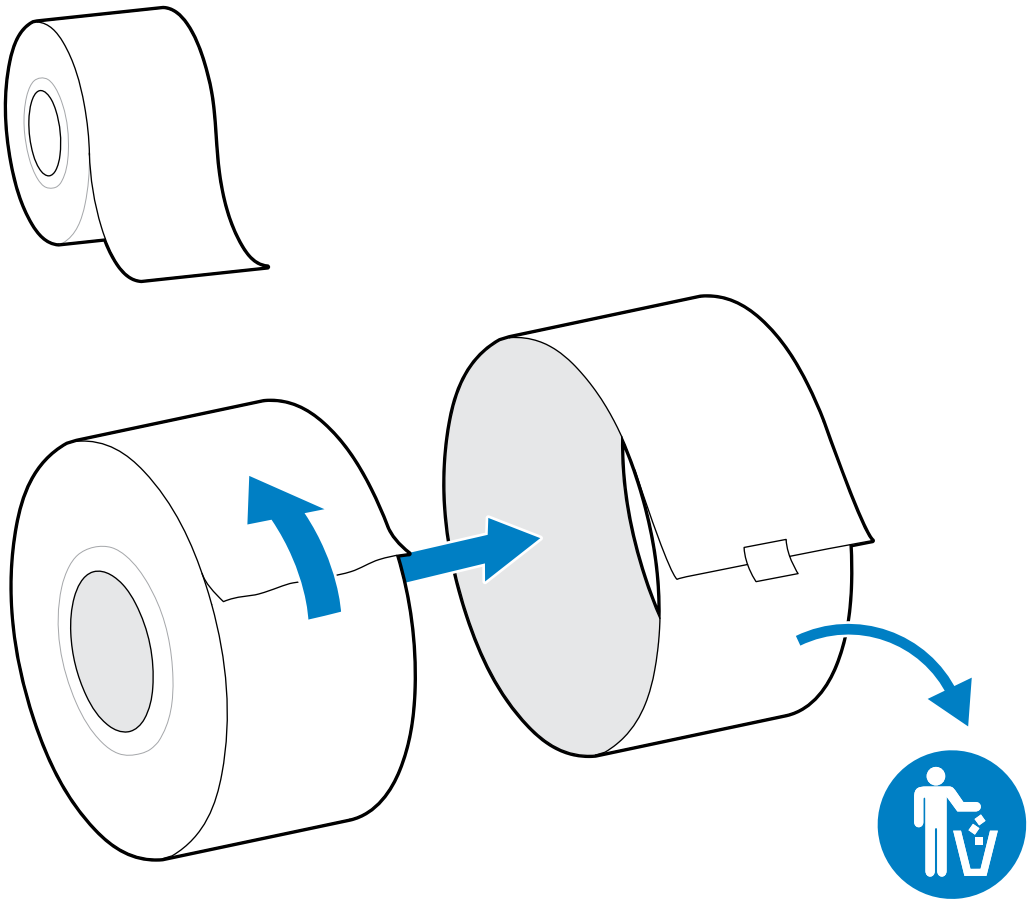
To procure media that is specifically designed for use with your Zebra printer, go to zebra.com/supplies.

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

Preparing and Handling Media

Careful handling and storage of your media are important to maximize print quality. If the media becomes contaminated or dirty, it can damage the printer and cause defects in the printed image, such as voids, streaks, discoloration, and compromised adhesive.

IMPORTANT: . To reduce the possibility of contaminants transferring from the media onto the printhead while printing, remove the outside layer of the media roll or stack.



Media Storage Guidelines

Follow these media storage guidelines for optimal print output.

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

NOTE: Direct thermal media is chemically treated to be heat-sensitive. Exposure to direct sunlight or heat sources may damage the media.

- Do NOT store media with chemicals or cleaning products.
- Leave media in its protective packaging and remove the packaging only before use.
- Many media types and label adhesives have a shelf life or expiration date. Always use the oldest viable (non-expired) media first.

Media Types and Sensing

Use the information in this section to understand various print media options and media sensing types.

Your printer supports three basic types of media:

Continuous media	Used for items like receipts. It has no marks to define print length.

Marked media	Includes black lines, black marks, notches, or holes to define the print length for each printed item.
Label media	Uses the sensor to look through the media backing (liner) to detect the beginning and end of labels on the roll.

The printer uses two sensing methods to accommodate the range of media it supports:

Center area transmissive sensing	For continuous media and gap/web label media.
Half-width movable (reflective) sensing	Used to determine print format (length) using the black marks, black lines, notches, or holes present on the media.

Setting Media Sensing by Media Type

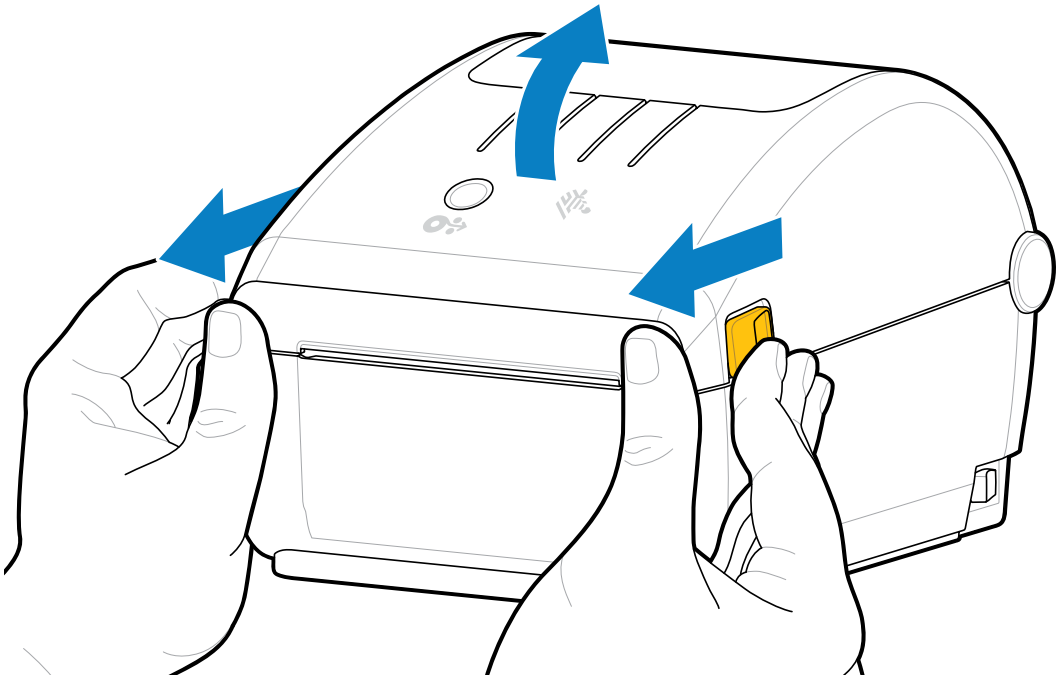
Your printer's media-sensing settings must match the type of media you use. For certain media types, sensing occurs automatically. For others, the sensor can be manually aligned.

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 senses only the media's characteristics. The print format length is set through programming (using a driver or software) or based on 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	Do one of the following depending on the media you plan to use: • Load the media (see Loading the Media on page 24). • Follow the steps in Printing on Fanfold Media on page 52.

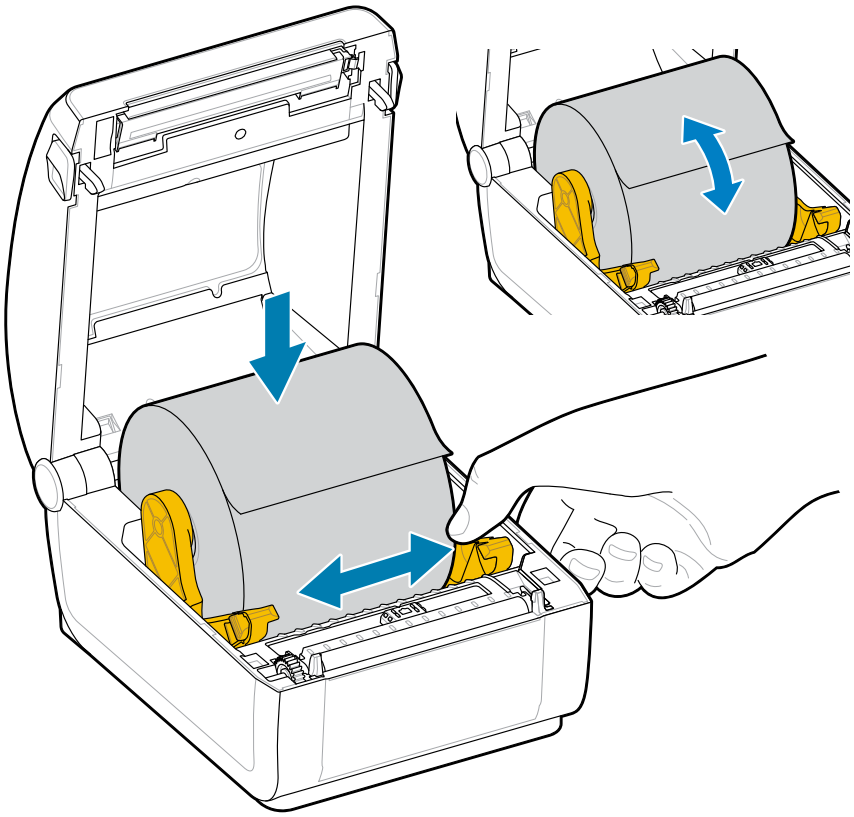
Loading the Media

This procedure describes how to load the media for your printer.

1. Open the printer by pulling the release latch levers toward the front of the printer.

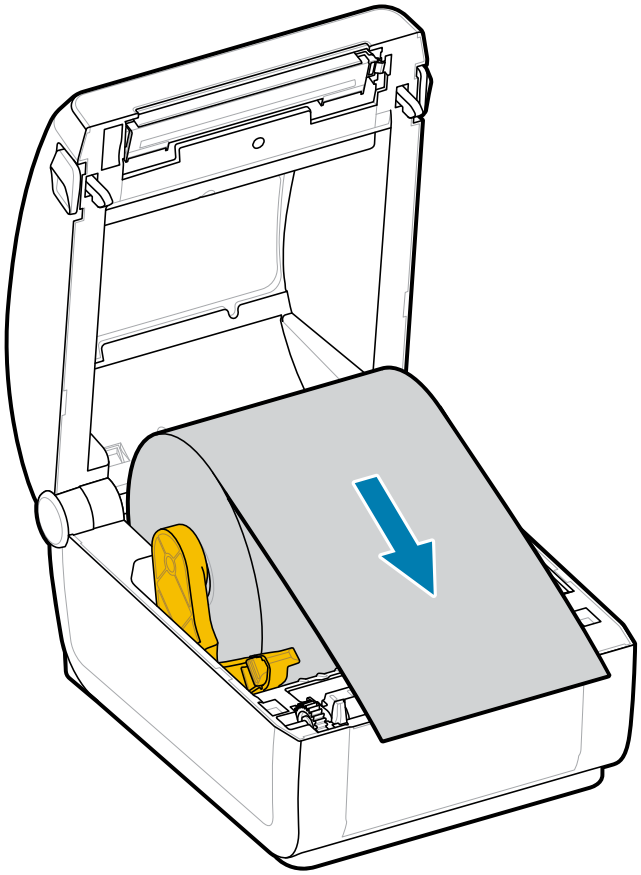


2. Open the media roll holders. With one hand, orient the media roll so that the printing surface faces up as it passes over the platen (drive) roller. Use your free hand to pull the media guides open. Place the media roll on the roll holders and release the guides. Ensure that the roll turns freely.

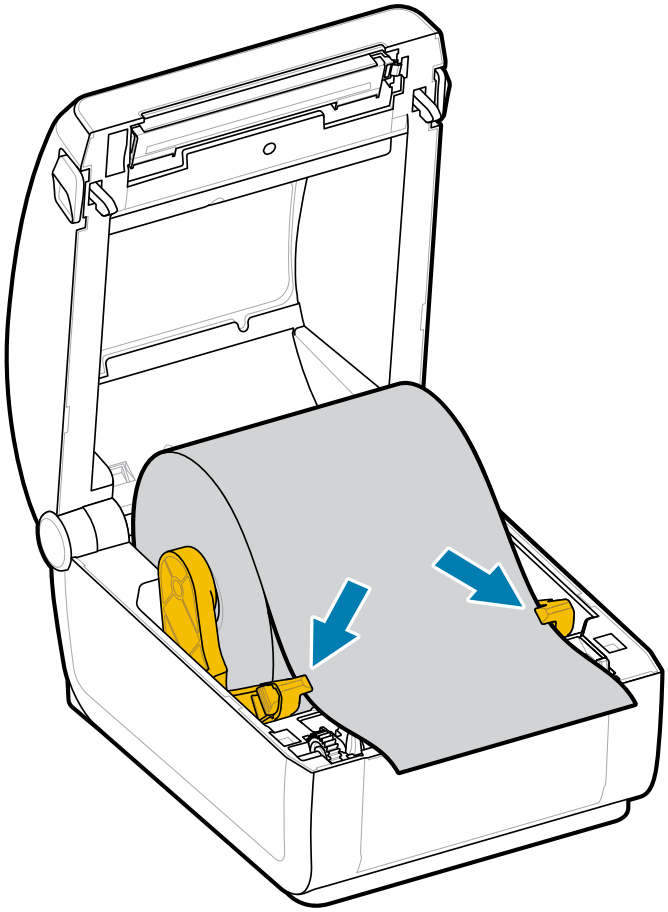


NOTE: Ensure the roll is NOT resting on the bottom of the media compartment.

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



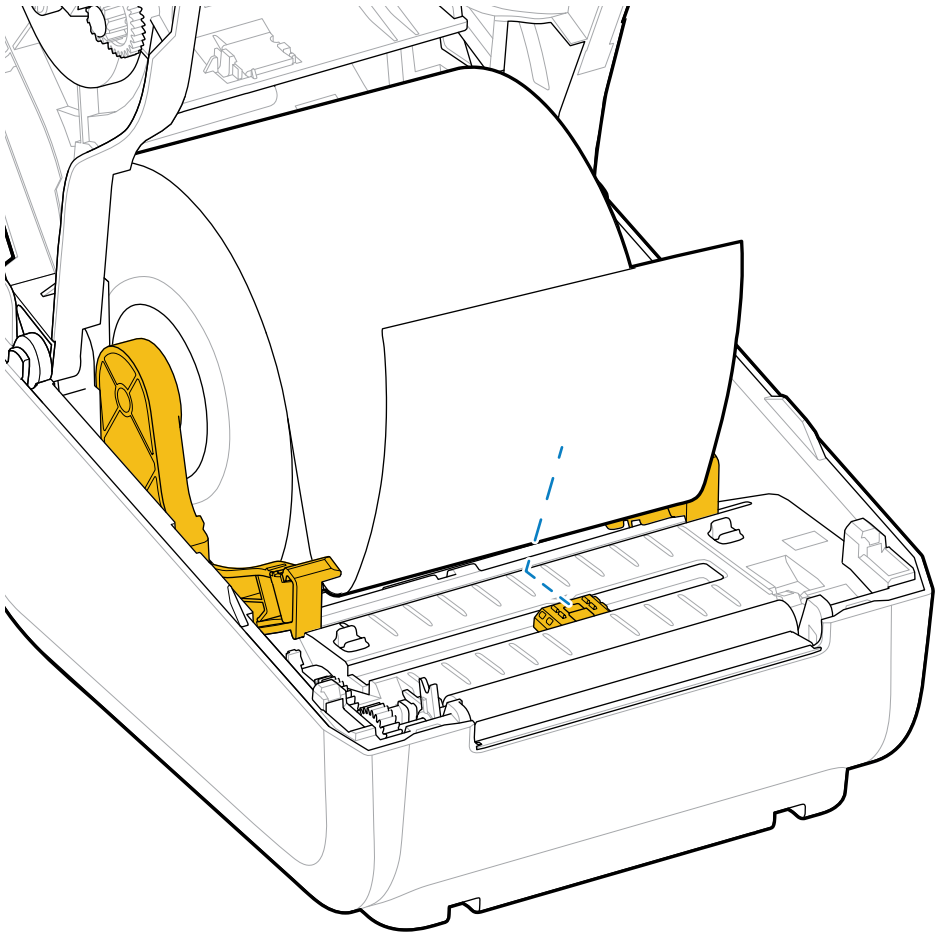
4. Push the media under both media guides.



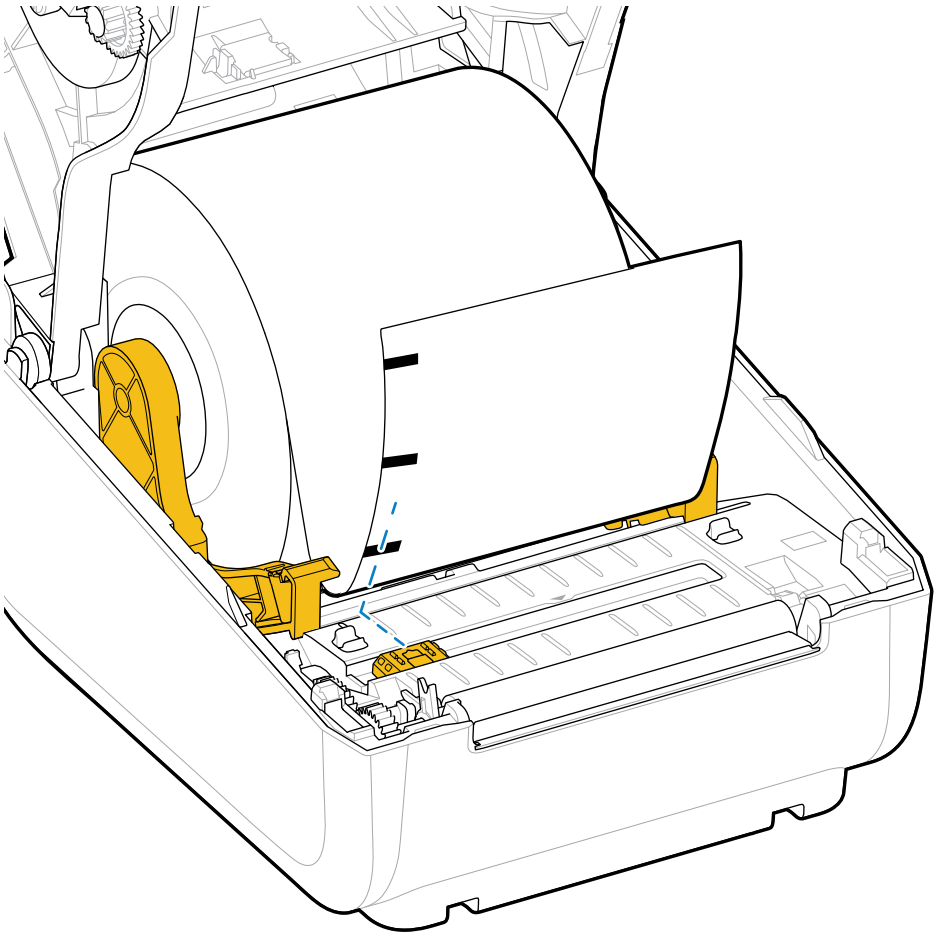
5. Flip the media up and align the movable media sensor according to your media type.

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

For black mark (black line, notches or holes), backed media...	Adjust the sensor position so that it aligns with the center of the black mark. Avoid the center area of the media so that you only use black-mark sensing when printing on black mark media.



Default - Web (Gap) Sensing Standard Operating Position



Off-Center Black Mark Sensing Only

Adjusting the Movable Sensor for Black Marks or Notches

The movable sensor is a dual-function sensor that provides both transmissive (it sees through media) and reflective media sensing. The printer can use only one of these sensing methods at any given time. When printing on black mark media, the movable sensor must be adjusted to detect the marks or notches on the media.

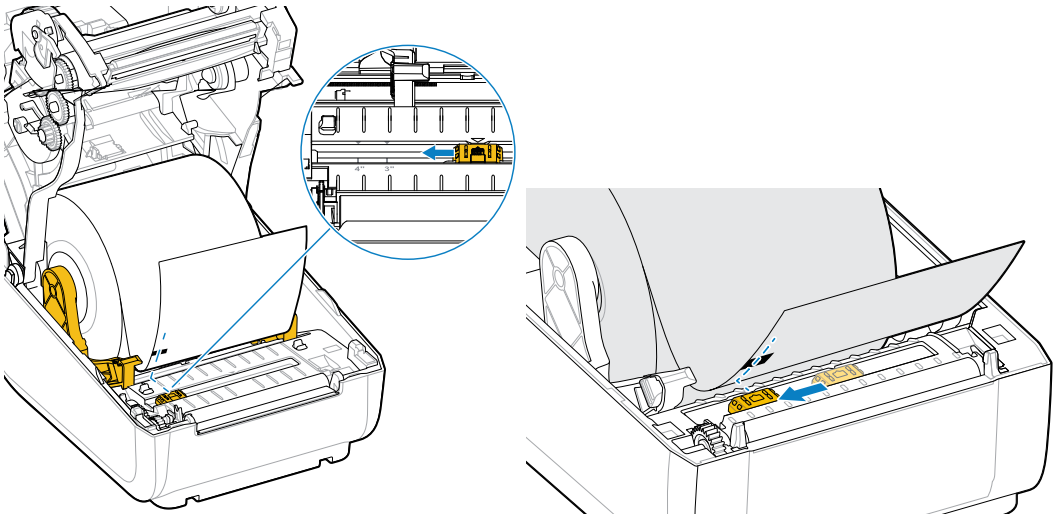
Black-mark sensing identifies non-reflective surfaces, such as black marks, black lines, notches, or holes on the back of the media. These surfaces do not reflect the sensor's near-infrared light beam back to the sensor's detector. The sensor light and its black-mark detector are positioned next to each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

The sensor has a single sensor position for web/gap media, which is its default position.

The design of the 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 the black marks or notches, not to the center of the media roll. This is to avoid using the web/gap sensing array.

1. Position the movable sensor's alignment arrow to the middle of the black mark or notch on the underside of the media.

2. Verify that you have set the sensor alignment as far from the edge of the media as possible, but where 100% of the sensor window is covered by the mark.



NOTE: There are 3" and 4" marks.

When printing, the media can shift from side to side ±1 mm due to media variations and edge damage due to handling. Additionally, notches cut into the side of the media may also become damaged.

Running a SmartCal Media Calibration

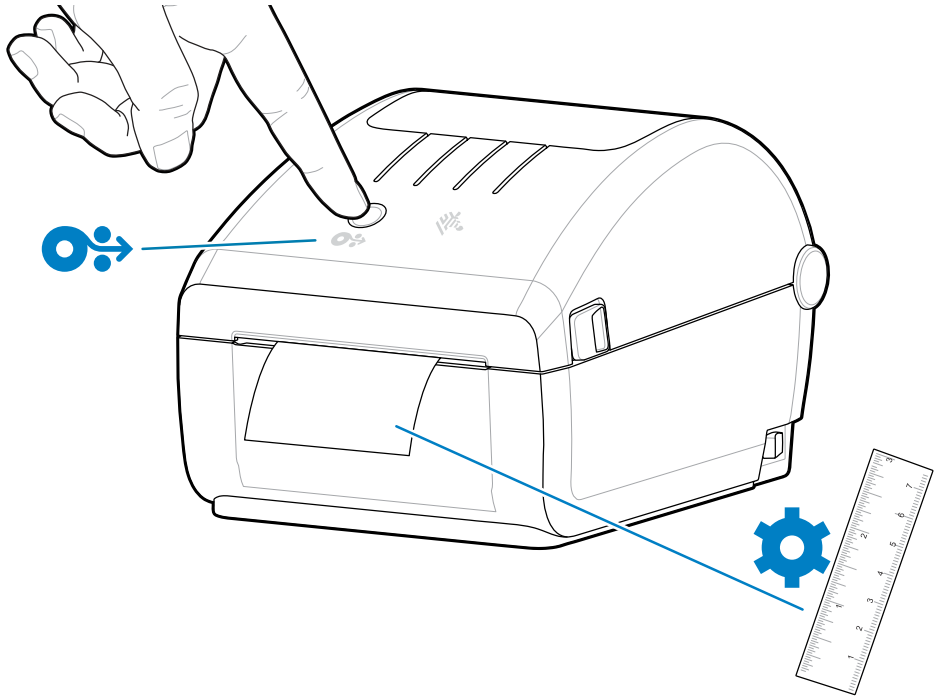
The printer must set media parameters for optimal operation before printing. To achieve this, it automatically determines the media type (web/gap, black mark/notch, or continuous) and measures media characteristics.

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

After loading a roll of new media from the same batch, press the **FEED** (Advance button) once or twice to synchronize the labels. This prepares the printer to continue printing with the new batch of media.

1. Make sure the media is loaded properly in the printer and the top cover of the printer is closed.
2. Press the **POWER** button to turn the printer on and wait until the printer is in the Ready state (the STATUS indicator lights up solid green).

3. Press and hold the **FEED** button for two seconds, until the STATUS indicator flashes once. Continue to hold the **FEED** button until it flashes two more times, then immediately release the button.



4. The printer will measure a few labels and adjust media sensing levels. When it has completed measuring, the STATUS indicator will turn solid green.

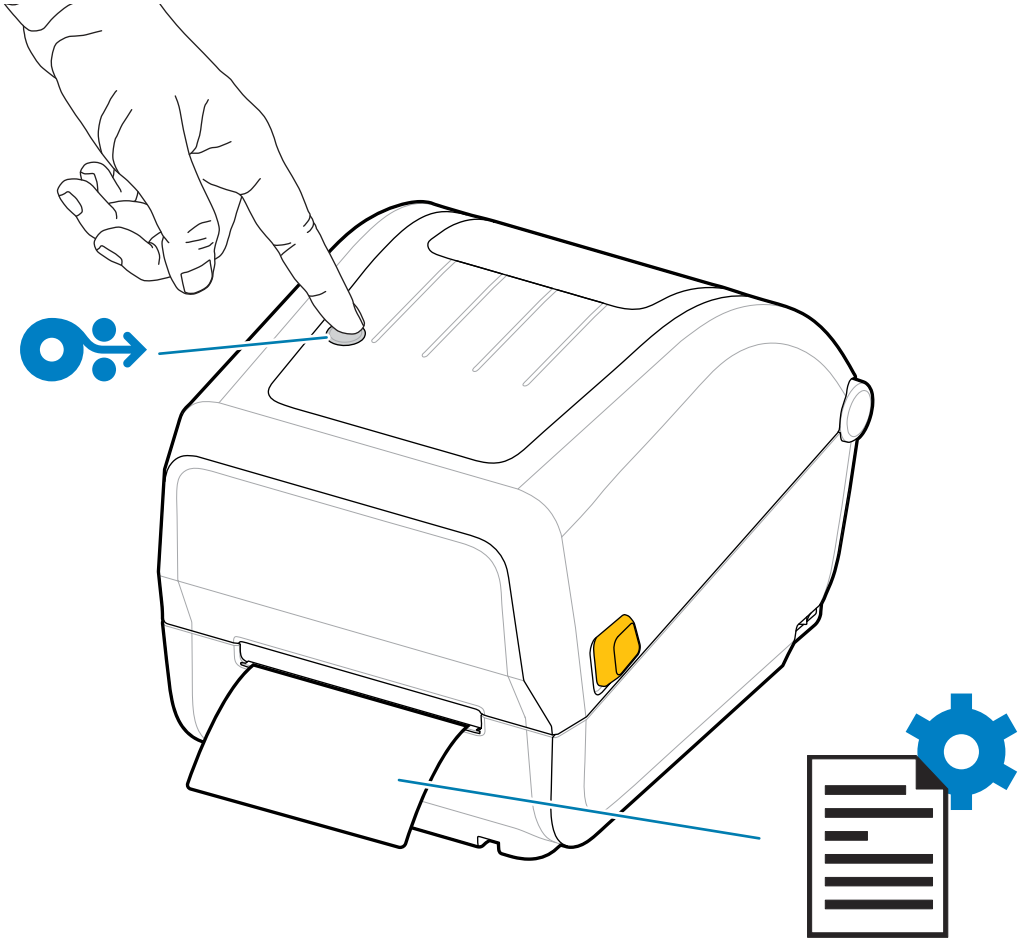
Test Printing with the Configuration Report

Before you connect the printer to a computer, ensure that the printer is in proper working order by printing a configuration report.

The information in the configuration report may assist with printer installation and troubleshooting.

1. Make sure the media is loaded properly in the printer and the printer's top cover is closed.
2. Turn the printer power ON.
3. After the printer is ready (STATUS indicator lights up solid green), press and hold the **FEED** button for approximately two seconds, until the STATUS indicator blinks once, then release the button.

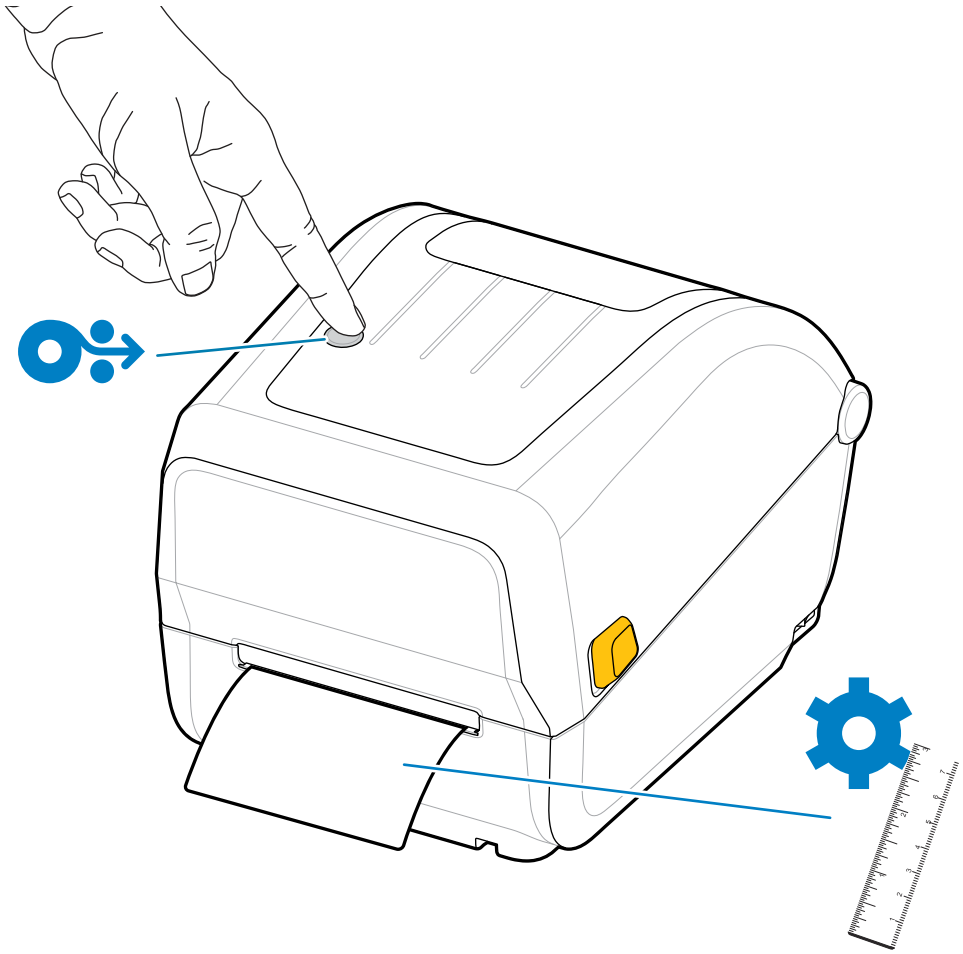
The Printer and Network Configuration Reports print. When the printer stops, the STATUS indicator turns solid green.



If you cannot print these reports, go to Troubleshooting on page 68.

Detecting and Recovering from a Media Out Condition

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



1. Open the printer (see Opening and Closing the Printer on page 7).

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

2. Remove the remaining media and roll core.
3. Insert a new roll of media. (See Loading the Media on page 24).

If you are installing more of the same media...	Load the new media and press the **FEED** (Advance) button once to resume printing.
If you are loading different media (different size, vendor, or batch)...	Load the new media and calibrate the printer to the media to ensure optimal operation. (See Running a SmartCal Media Calibration on page 30.)

NOTE: If you load media of a different size (length or width), it is often necessary to change the programmed media dimensions or the active label format in the printer.

Connecting Your Printer to a Device

Zebra printers support a variety of interface options and configurations.

1. Decide how you will connect to the printer.

   Your printer supports the following interface options and configurations:

   - Universal Serial Bus (USB 2.0) interface—Standard (see Interface Cable Requirements on page 34 and USB Interface on page 35 for cable requirements).

   The central device can be a Windows PC or laptop running the operating systems listed in Setup for Windows OS on page 42, an Android device, or an Apple device.

2. Switch the printer power OFF (see POWER Button on page 14).
3. Connect the printer to the computer or device you will use to manage the printer.
4. Run Zebra Setup Utilities (ZSU) from your central device (see Running the Printer Installation Wizard on page 45).

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

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

   The ZSU wizard installs the Zebra Windows drivers.

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

Interface Cable Requirements

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

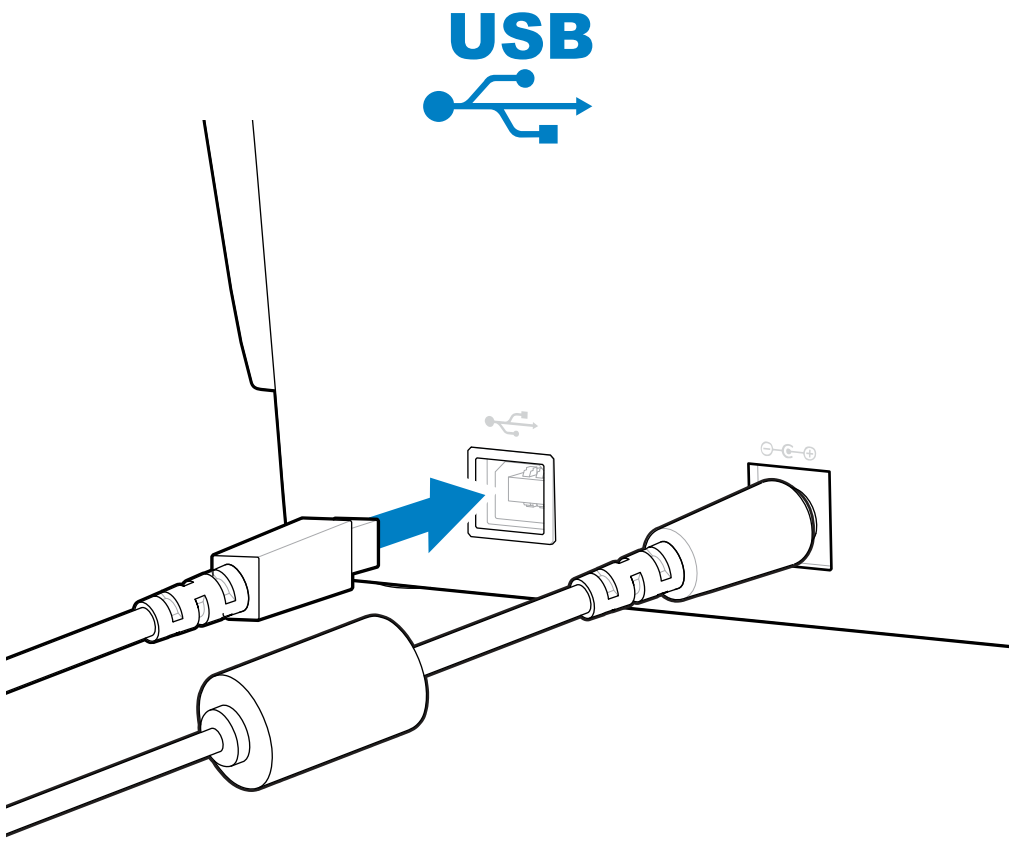
To minimize electrical noise pickup in the cable:

- Keep data cables as short as possible (1.83 m [6 ft.] recommended).
- Do NOT tightly bundle the data cables with power cords.
- Do NOT tie the data cables to power wire conduits.

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

USB Interface

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



When selecting a USB cable for use with your printer, verify that the cable or cable packaging bears the Certified USB mark to guarantee USB 2.0 compliance.

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

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

NOTE: The images in this section depict screens for Windows 10. The screens that display for you depend on the operating system.

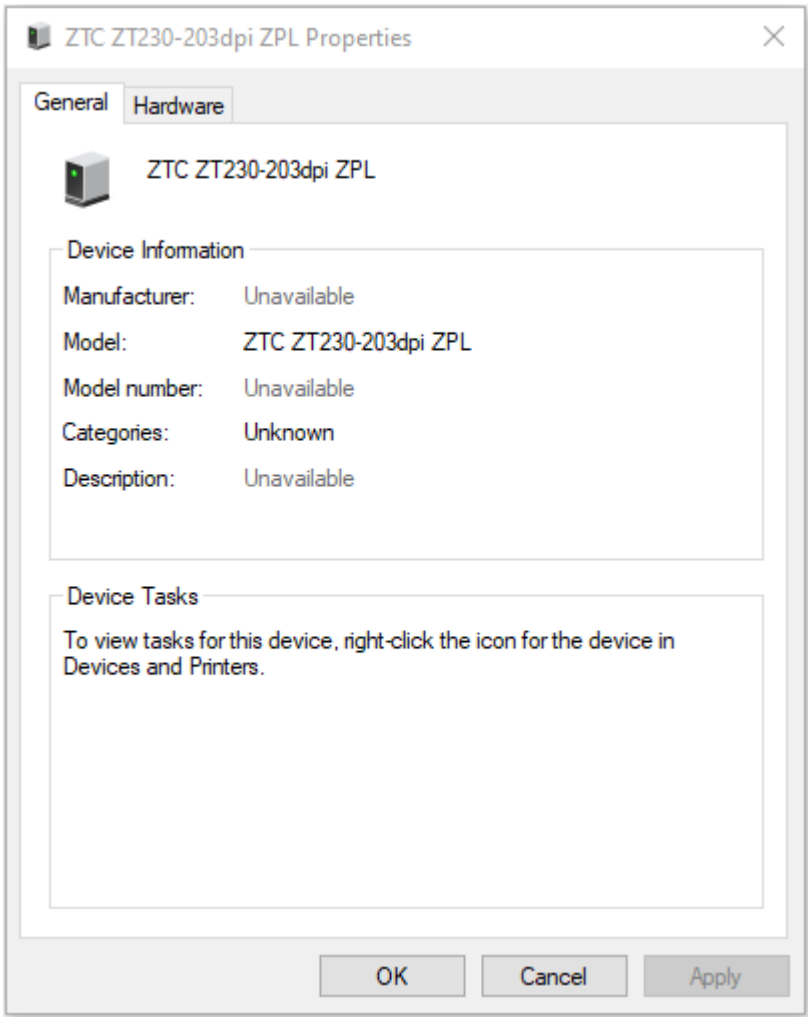
1. From the **Windows** menu, open the **Control Panel**.

2. Click **Devices and Printers**.

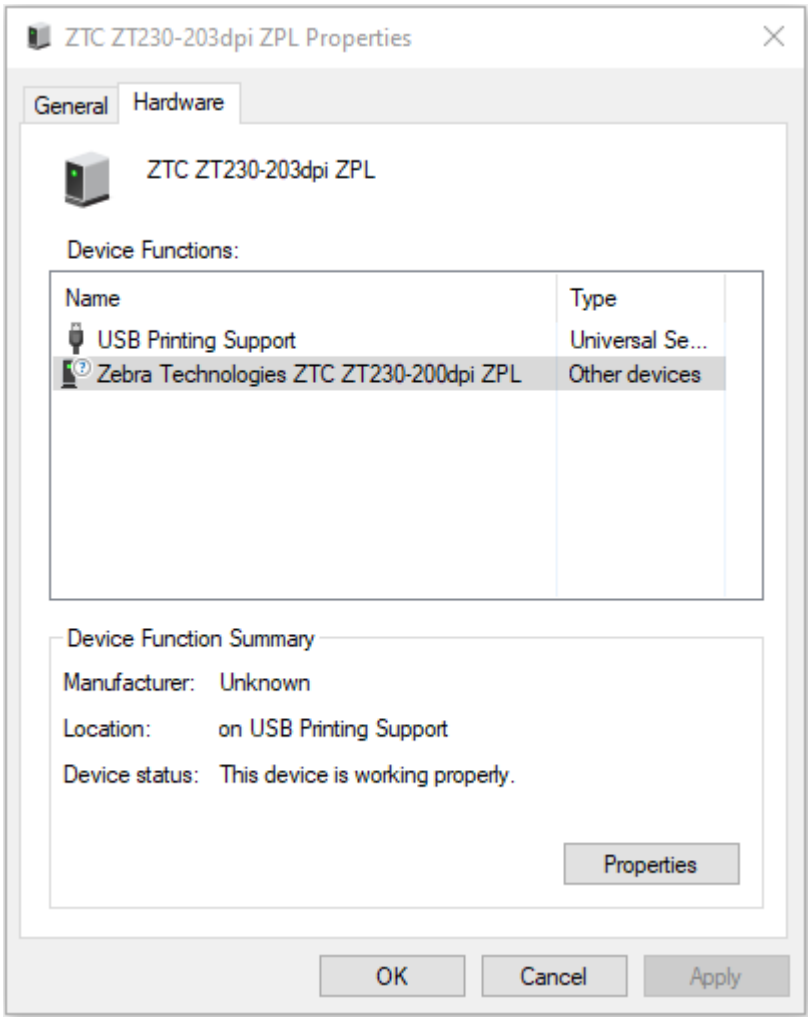
   In this example, the ZTC ZT320-203dpi ZPL is an incorrectly installed Zebra printer.

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

   The properties for the device display.

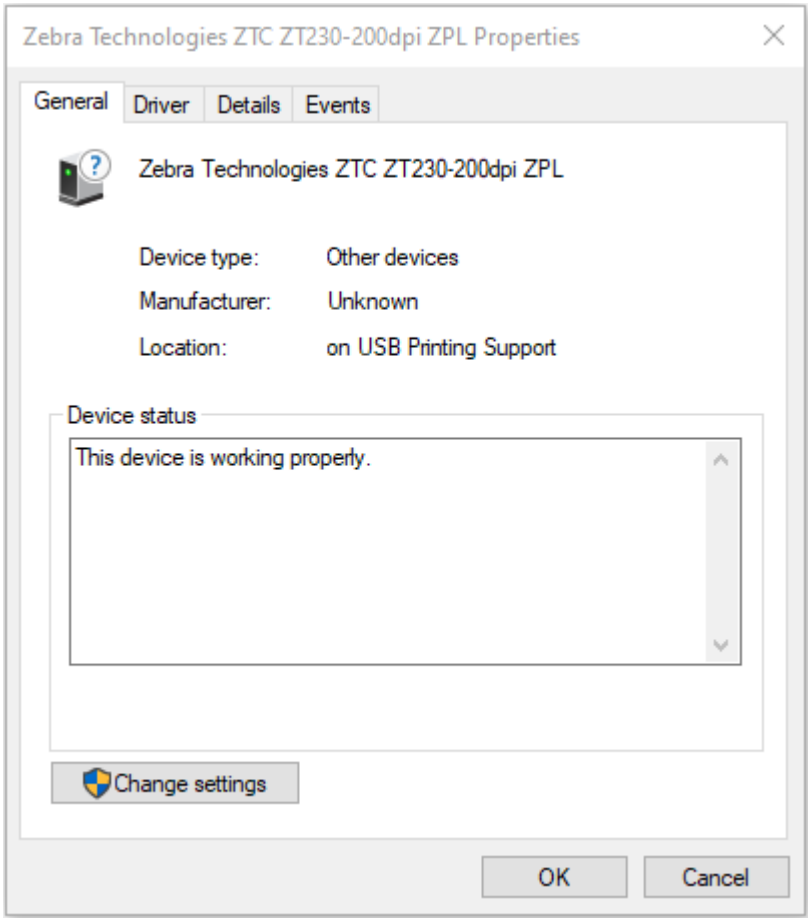


4. Click the **Hardware** tab.

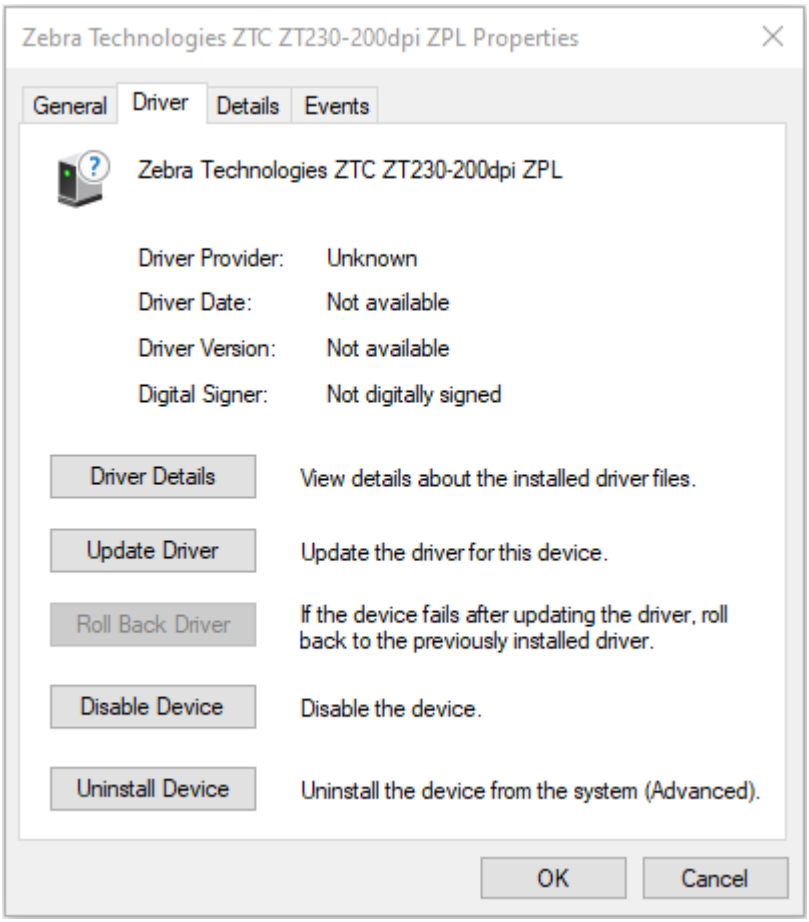


5. Select the printer in the **Device Functions** list, and then click **Properties**.

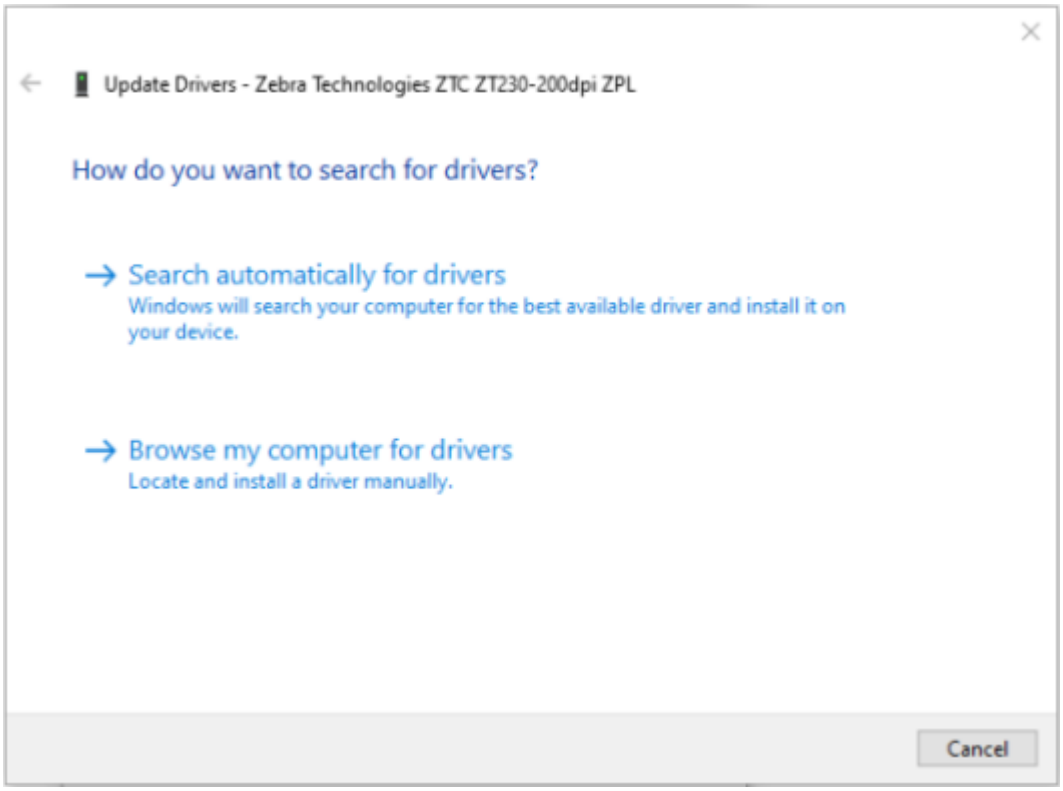
   The properties display.



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

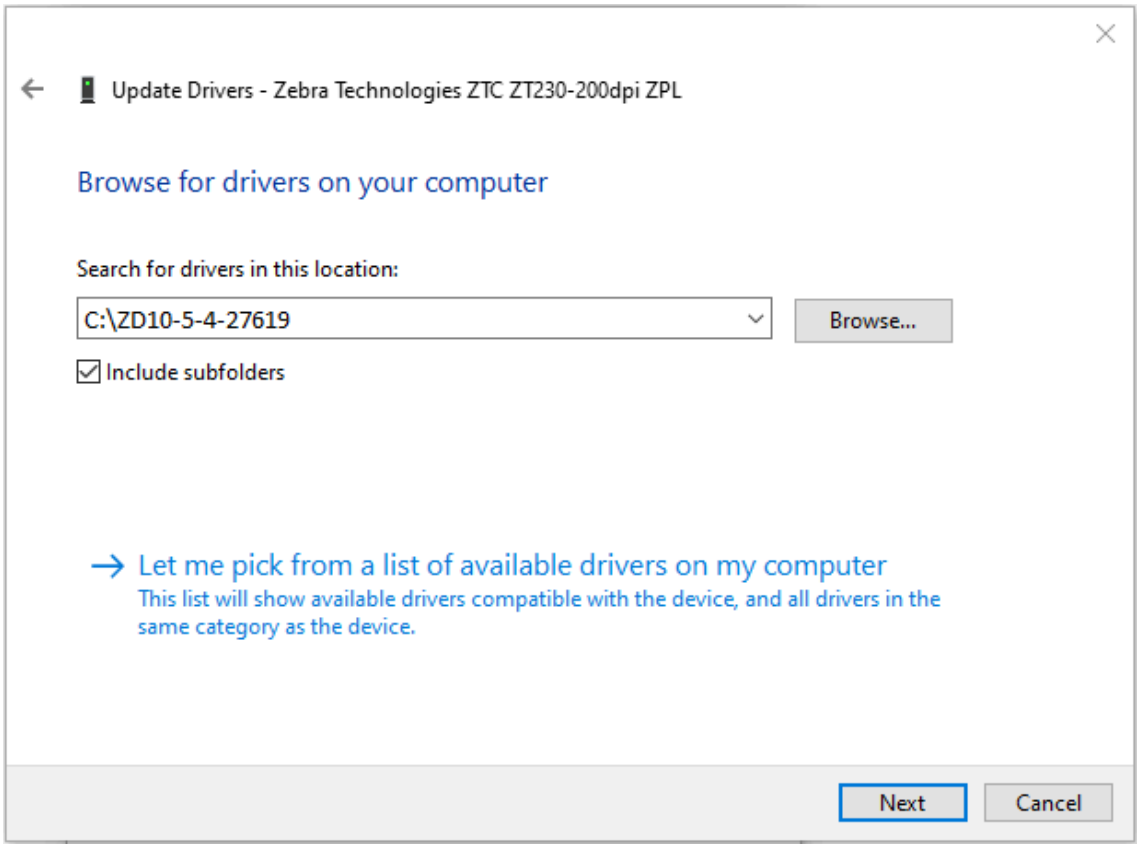


7. Click **Update Driver**.



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

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



11. Click **Next**.

The device is updated with the correct drivers.

Setup for Windows OS

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

Windows to Printer Communication Setup (Process Overview)

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

1. Download the Zebra Setup Utilities (ZSU) from the ZD100da Direct Thermal Desktop Printer page on the Zebra website at zebra.com/zd100-info. (See Installing the Windows Printer Drivers on page 42.)
2. Ensure printer power is OFF.
3. Run Zebra Setup Utilities (ZSU) from your `Download` directory.
4. Click **Install New Printer** and run the installation wizard.
5. Click **Install Printer**, then select your printer's model number from the list of Zebra printers.
6. Select the appropriate USB port and connect it to the PC.
7. Turn the printer power ON when the wizard instructs you to do so.
8. Use the wizard to configure printer communications for the selected interface type.
9. Perform a print test to verify that your printer has been setup properly.

IMPORTANT: If you did not install the printer drivers before connecting to the printer when it was powered ON, see What To Do If You Forget to Install the Printer Drivers First.

Installing the Windows Printer Drivers

To use your printer with a Microsoft Windows-based computer, you must first install the correct drivers. Use the Zebra Setup Utilities to install the printer drivers on your central device and ensure the printer power is switched off when you run the Utilities. These drivers enable you to set up and manage your printer conveniently from your central device.

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

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

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

- For basic interface cabling requirements, see Interface Cable Requirements on page 34.
- For USB cable requirements and information on basic USB connectivity, see USB Interface on page 35.

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

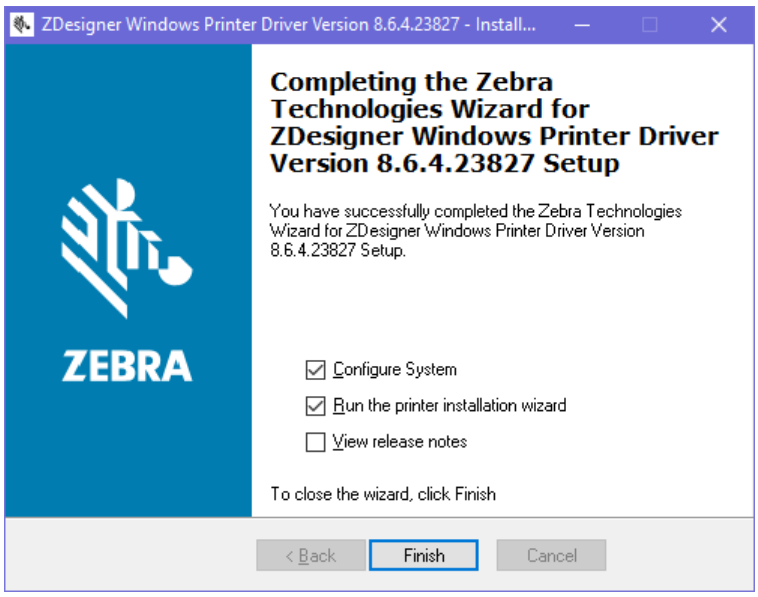
   The driver executable file (such as `zddriver-v10-6-12-28213-installer.exe`) is added to your Download folder.
6. Ensure printer power is OFF.

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

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

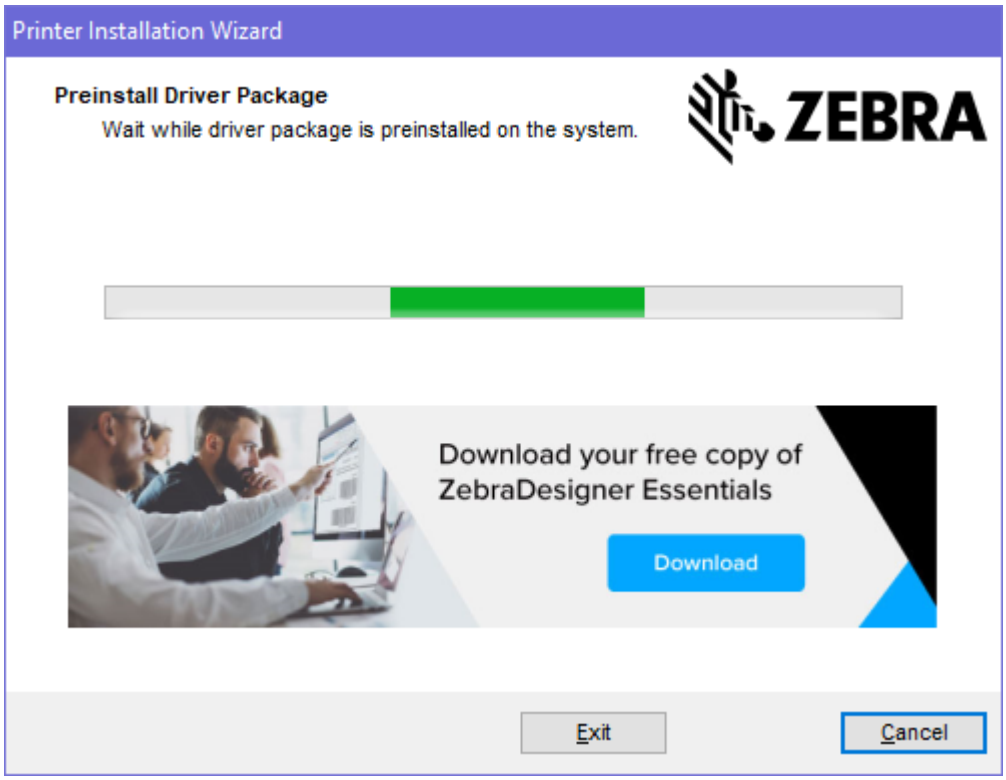
   The setup wizard installs the printer drivers and prompts you to turn printer power ON.

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



8. Select **Configure System**, then click **Finish**.

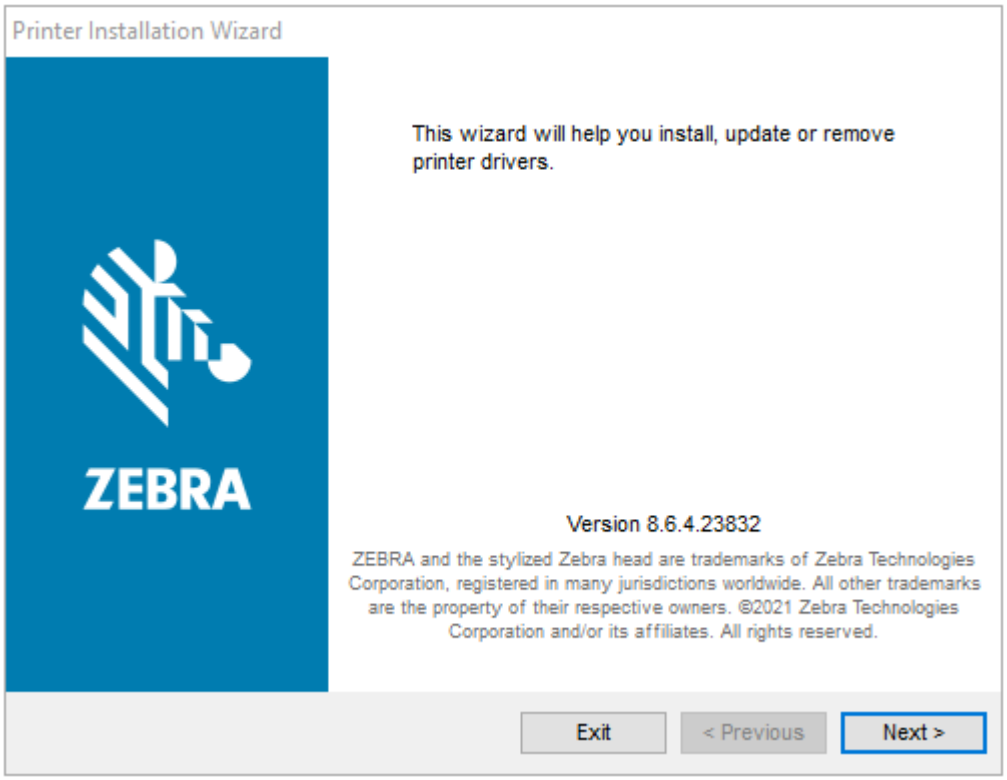
   The Printer Installation Wizard installs the drivers.



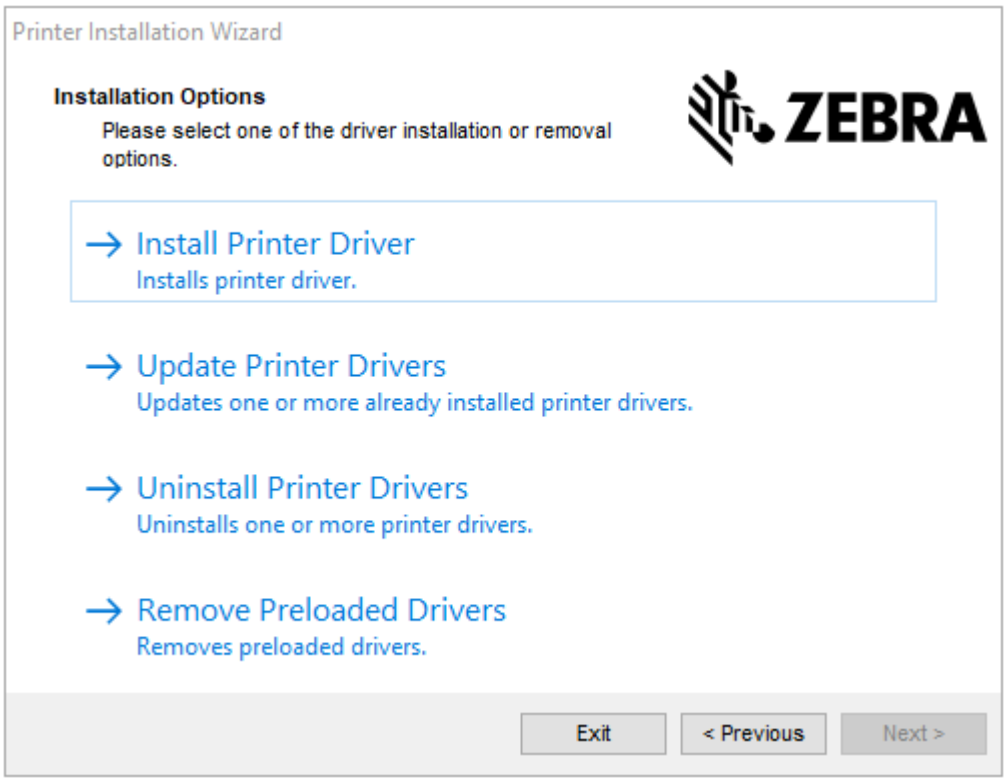
Running the Printer Installation Wizard

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

   The Printer Driver Wizard displays.



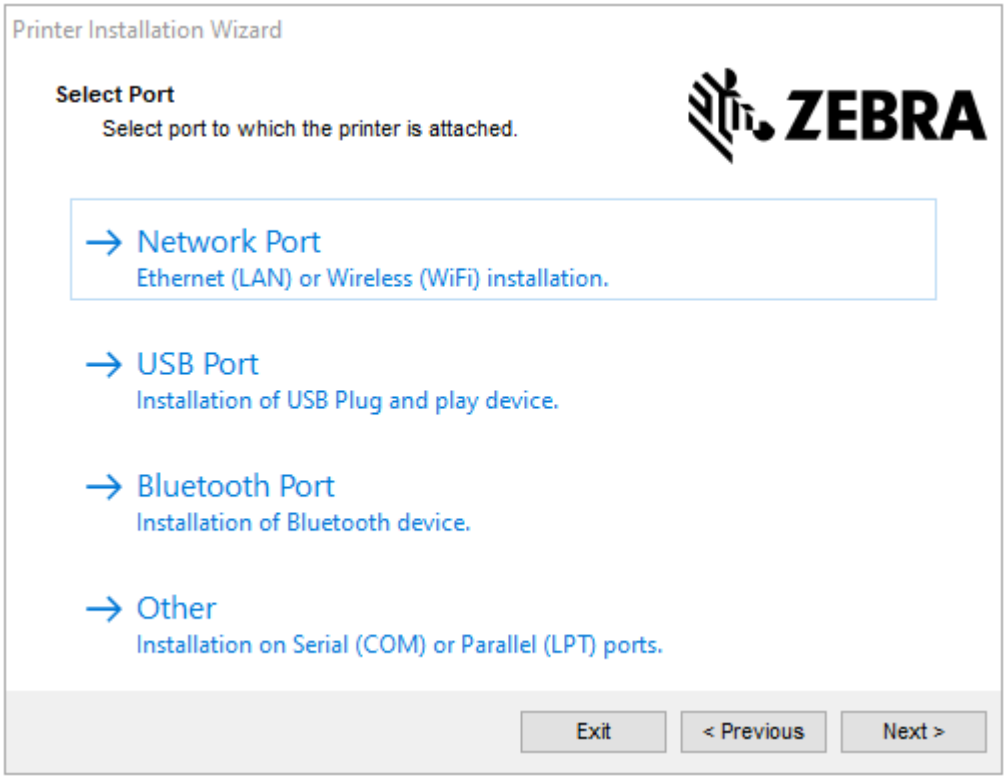
2. Click **Next**.


Printer Installation Wizard
Installation Options
Please select one of the driver installation or removal options.
ZEBRA
Install Printer Driver
Installs printer driver.
Update Printer Drivers
Updates one or more already installed printer drivers.
Uninstall Printer Drivers
Uninstalls one or more printer drivers.
Remove Preloaded Drivers
Removes preloaded drivers.
Exit
< Previous
Next >

3. Click **Install Printer Driver**.

   The license agreement displays.

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



5. Select the communication option that you want to configure for your printer:
   - USB Port: For installing printers connected with the USB cable. Connect the printer to the computer. If the printer is already connected and powered on, you may need to remove the USB cable and install it again. The driver will automatically search for the model of the connected printer.
6. If prompted, select your printer model and resolution.

   The model and resolution are listed on the printer configuration label. See Test Printing with the Configuration Report on page 31 for instructions on printing a label.

After Your Printer is Connected

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

Verifying printer operation is a relatively simple process:

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

Test Printing with Zebra Setup Utilities

Print a configuration report to test the printer.

1. Open the Zebra Setup Utilities.

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

The printer should print a configuration report. If it doesn't, make sure the printer is set up according to the instructions in this guide and use the information in the Troubleshooting section to resolve any issues.

Test-Printing with the Windows Printer and Faxes Menu

Print a test page to test the printer.

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

The printer prints a Windows test page.

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

Print a configuration report to test the printer.

1. Create a text file with this ASCII string: `~WC`
2. Save the file with a name such as `TEST.ZPL`.
3. Copy the file to the printer. If using DOS to send a file to a printer connected to the system's serial port, you would issue the command: `COPY TEST.ZPL COM1`

NOTE: Based on your operating system and other interface connection types, you will need different command strings. See your operating system documentation for instructions on how to copy the file to the appropriate printer interface for this test.

The printer prints a Print Configuration Report.

Print Operations

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

NOTE: To help prevent the motor from overheating, the printer automatically pauses for a few seconds when it has been printing aggressively for an extended time. The printer will print a few labels followed by a short pause and then repeat these actions as needed.

Replacing Supplies while Using the Printer

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

Sending Files to the Printer

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

Determining Your Printer's Configuration Settings

The ZD Series printer can print a configuration report listing printer settings and hardware details.

Included in this report are:

- Operational status (darkness, speed, media type, etc.)
- Printer details (serial number, model name, firmware version, etc.)

For instructions on printing this label...	See Test Printing with the Configuration Report on page 31.
For information on interpreting the configuration report and the associated programming command and command states identified in the report.	See Managing the ZPL Printer Configuration on page 84 to learn how to interpret the configuration report, and the associated programming command and command states listed in the report.

Selecting a Print Mode

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

To set the printer to use a specific print mode, see the instructions on using the ^MM command in the ZPL Programming Guide. The manual is available for download at zebra.com/zd100-info.

These print modes are available with your printer:

Tear Off (Default; available with any printer option and with most media types.)	The printer prints the labels as it receives them. The labels can be torn off after they print.

Adjusting Print Quality

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

Print quality can be configured using the Zebra Setup Utility's **Configure Print Quality** routine.

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

You can control the print darkness (or density) setting using one of the following methods:

- The Set Darkness (~SD) ZPL command (see the ZPL Programming Guide for details).
- The Windows printer driver.
- An application software such as ZebraDesigner.
- The Print Rate (^PR) command, which can lower the print speed to 102 mm/sec (4 ips, the default). (See the ZPL Programming Guide for details.)

After adjusting these settings, you can verify them by printing a Printer Configuration label (see Test Printing with the Configuration Report on page 31).

Adjusting Print Width

You must set the print width before using the printer for the first time. You must also set it when you load media into the printer that is of a different width from the one used in the previous batch of printing.

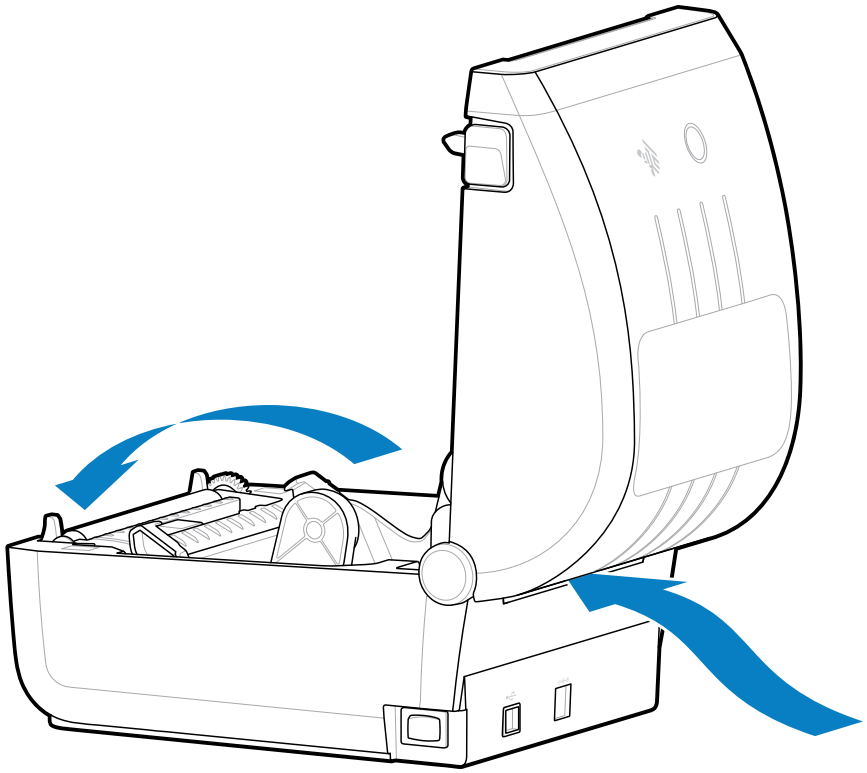
To set the print width, you can use one of the following methods:

- Your Windows printer driver.
- Application software such as ZebraDesigner.
- The ZPL Print Width (^PW) programming command. (See your ZPL Programming Guide for details.)

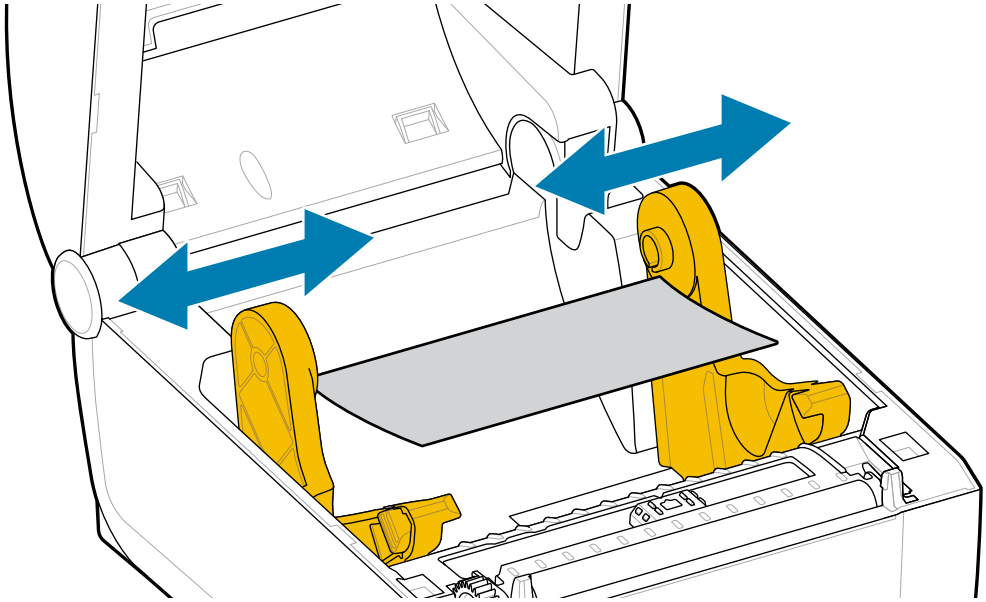
Printing on Fanfold Media

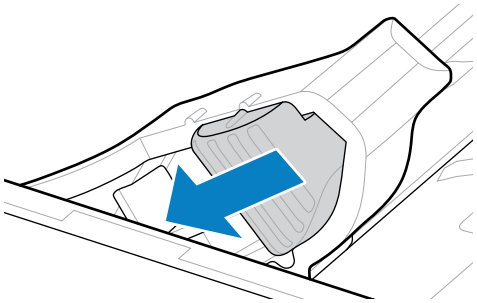
You will need to adjust the media guides' stop position when printing on fanfold media.

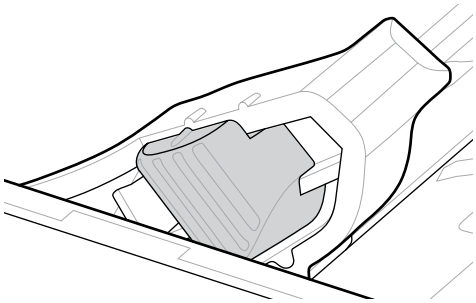
1. Open the top cover.



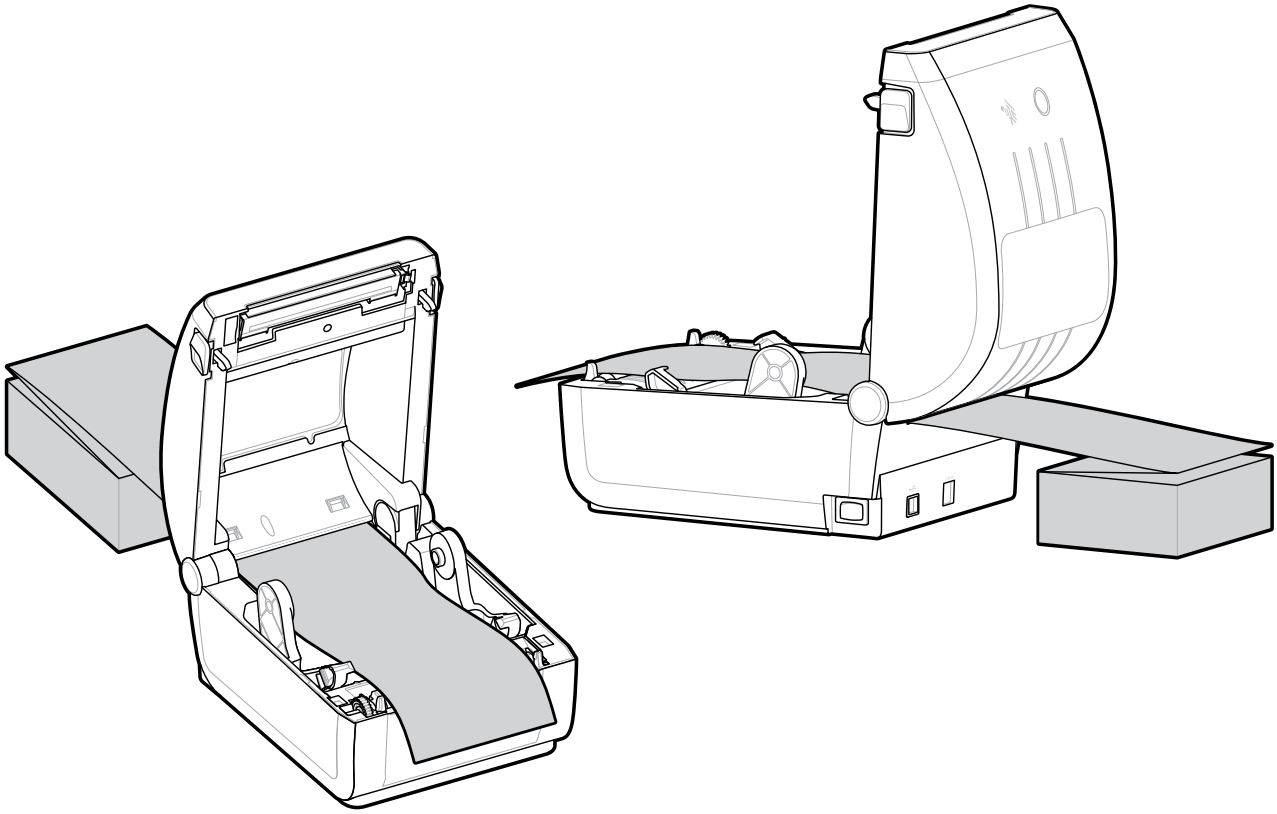
2. Adjust the media guide stop position using the gold thumb wheel.
   a) Use a piece of the fanfold media to help set the stop position.
   b) Push the gray locking slide on the left-hand roll holder towards the back of the printer to lock the roll holder position.
   c) Pull it forward to release the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







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



4. Close the top cover.

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

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

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

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

Printing with Externally-Mounted Roll Media

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

Consider the following when using externally-mounted roll media:

- The media should ideally enter the printer from directly behind the printer and pass through the fanfold media slot in the rear of the printer. (For media loading instructions, see Printing on Fanfold Media.)
- Use the default print speed of 152.4 mm/sec (6 ips) for 203 DPI. See your ZPL Programming Guide for instructions on setting the print speed using the Print Rate or ^PR command.)

- The media should move smoothly and freely. It should not slip, skip, jerk, bind and then move, etc. when mounted on your media stand.
- The movement of the media roll should not be impeded by contact with the printer or other surfaces.
- Position the printer to ensure it does not slip or lift up away from its operating surface while printing.

Printer Fonts

The ZD Series printer supports multiple languages and fonts.

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

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

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

- For descriptions and documentation of the fonts, code pages, character access, listing fonts, and limitations for their respective printer programming languages, see the ZPL and the legacy EPL programming guides downloadable from zebra.com/manuals.
- For information on text, fonts, and character support, see the printer programming guides.

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

IMPORTANT: Some ZPL fonts that are factory-installed in your printer are license-restricted. They CANNOT be copied, cloned, or restored to your printer by reloading or updating the firmware. If these license-restricted ZPL fonts are removed using an explicit ZPL object delete command, you will need to repurchase and reinstall them using a font activation and installation utility.

EPL fonts do not have this restriction.

Identifying Fonts in Your Printer

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

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

Specific to ZPL fonts:

To manage and download fonts for ZPL print operation	Use the Zebra Setup Utility or ZebraNet Bridge Utilities.
To display all fonts loaded onto your printer	Send the ^WD ZPL command to the printer. See the ZPL Programming Guide for details.

	In ZPL: • The bitmap fonts in the various printer memory areas are identifiable by the `.FNT` file extension. • The scalable fonts are identified with the `.TTF`, `.TTE`, or `.OTF` file extensions. (EPL does not support these fonts.)

Localizing the Printer with Code Pages

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

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

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

Asian Fonts and Other Large Font Sets

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

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

The invention of Unicode enabled the ability to support multiple languages using a single font set. A Unicode font supports one or more code points, related to code page character maps accessed in a standard method, that resolves character mapping conflicts.

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

NOTE: Some Unicode fonts are large-sized. These include MS (Microsoft) Arial Unicode font (23 MB) available from Microsoft and the Andale font (22 MB) offered by Zebra. These large font sets typically support many languages, but cannot be downloaded to the ZD100da due to the font file size.

Procuring and Installing Asian Fonts

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

ZPL fonts are purchased separately from the printer.

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

- Simplified and Traditional Chinese
- Korean, including Johab
- Thai

Media Roll Adapters

The media roll adapters kit includes a pair of 38.1 mm (1.5 in.) inner diameter (I.D.) media roll adapters and two mounting screws.

While the media roll adapters are intended to be permanently installed in the printer, they can be changed as necessary to support various media roll sizes.

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

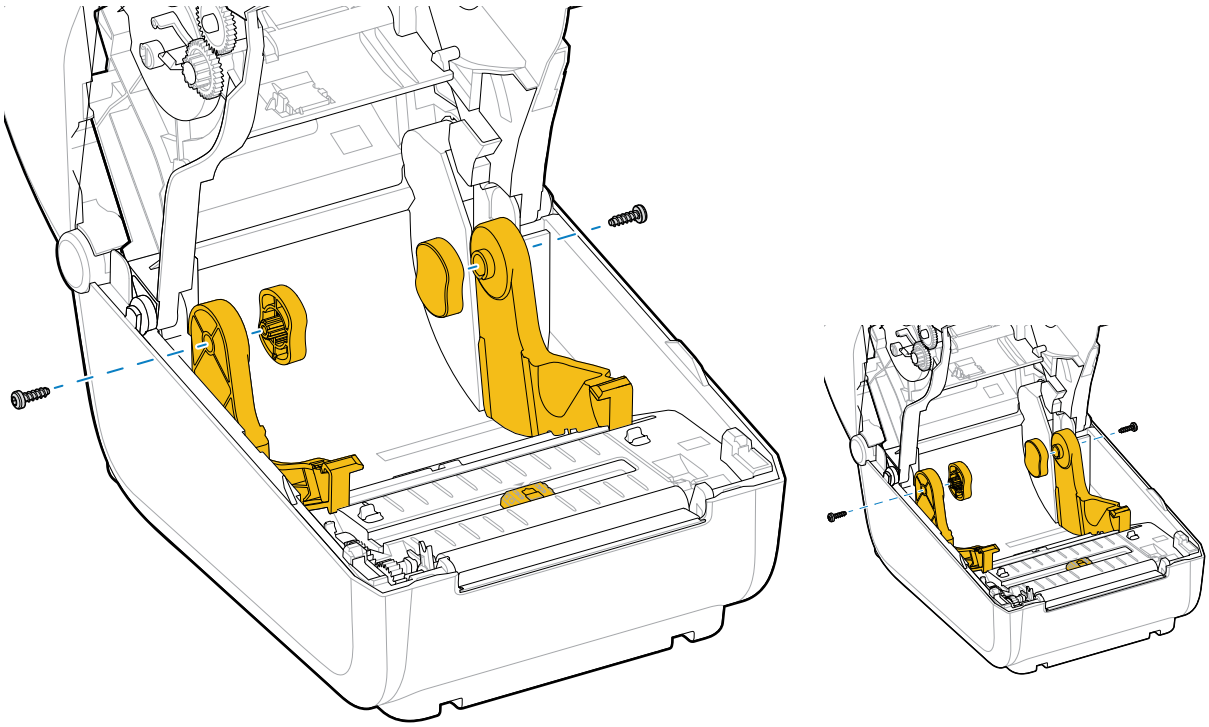
Removing the media adapters to print on standard roll cores may leave plastic pieces in the media roll holder's side areas that rub against the roll. These attached pieces can be pushed back into the side of the media roll holder.

Installing a Media Roll Adapter

The media roll adapters may wear out if changed too frequently. If possible, try to minimize the number of times you change them.

1. Place one screw in the top adapter mounting hole on the roll holder.
2. Turn the screw clockwise with a Torx wrench until the tip of the screw just protrudes through the inside of the roll holder.

   The screws are self-tapping.



3. Place the adapter on the inside of the roll holder ensuring the large side of the adapter is on top and the smooth side (no ribs) faces the middle of the printer.
4. Align the adapter’s top screw hole with the protruding screw tip and pinch it tightly to the roll holder body.

5. Tighten the screw until there is no gap between the adapter and roll holder.

NOTE: Do NOT tighten beyond this point. Over-tightening will strip the thread.

6. 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.

NOTE: Do NOT tighten beyond this point. Over-tightening will strip the thread.

7. Repeat the above steps for the other adapter and roll holder.

When you remove the media adapter to print on standard roll cores, plastic pieces may be left behind in the media roll holder's side areas and rub against the roll. Push these attached pieces back into the side of the media roll holder.

Maintenance

Perform the routine cleaning and maintenance procedures in this section for optimal printer operation.

Cleaning

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

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

CAUTION—EYE INJURY: When using compressed air to clean the sensors, wear eye protection to shield your eyes from flying particles and objects.

Cleaning Supplies

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

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

Printhead cleaning pens	For routine printhead cleaning.
99.7% min. pure isopropyl alcohol	Use a labeled alcohol dispenser. **NOTE:** Never re-moisten cleaning materials used to clean the printer. Always use clean supplies.
Fiber-free cleaning swabs	To clean the media path, guides, and sensors.
Cleaning wipes	To clean the media path and interior (for example, Kimberly-Clark Kimwipes)
Can of compressed air	**CAUTION—PRODUCT DAMAGE:** DO NOT use an air compressor in place of the can of compressed air. Air compressors have micro-contaminants and particles that can enter the air system and damage your printer.

IMPORTANT: To avoid product damage and risk of personal injury, follow the precautions included in each cleaning procedure when cleaning the printer.

Recommended Cleaning Schedule

Printer part	Cleaning Interval	Cleaning Procedure
Printhead	After every five rolls printed.	See Cleaning the Printhead on page 60.
Platen (drive) roller	As needed to improve print quality. (Platen rollers can slip, causing print image distortion, and in worst-case scenarios not move the loaded print media.)	See Cleaning and Replacing the Platen (Driver Roller) on page 63.
Media path	As needed.	Clean it thoroughly with fiber-free cleaning swabs and cloths moistened with 90% isopropyl alcohol. Let the alcohol evaporate completely. See Cleaning the Media Path on page 61.
Interior	As needed.	Use a soft cloth, brush, or compressed air to wipe or blow dust and particles out of the printer. Use 90% isopropyl alcohol and a fiber-free cleaning cloth to dissolve contaminants like oils and grime.
Exterior	As needed.	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 it in the printer or other areas. Do not clean connectors or interior of the printer with this method.

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).

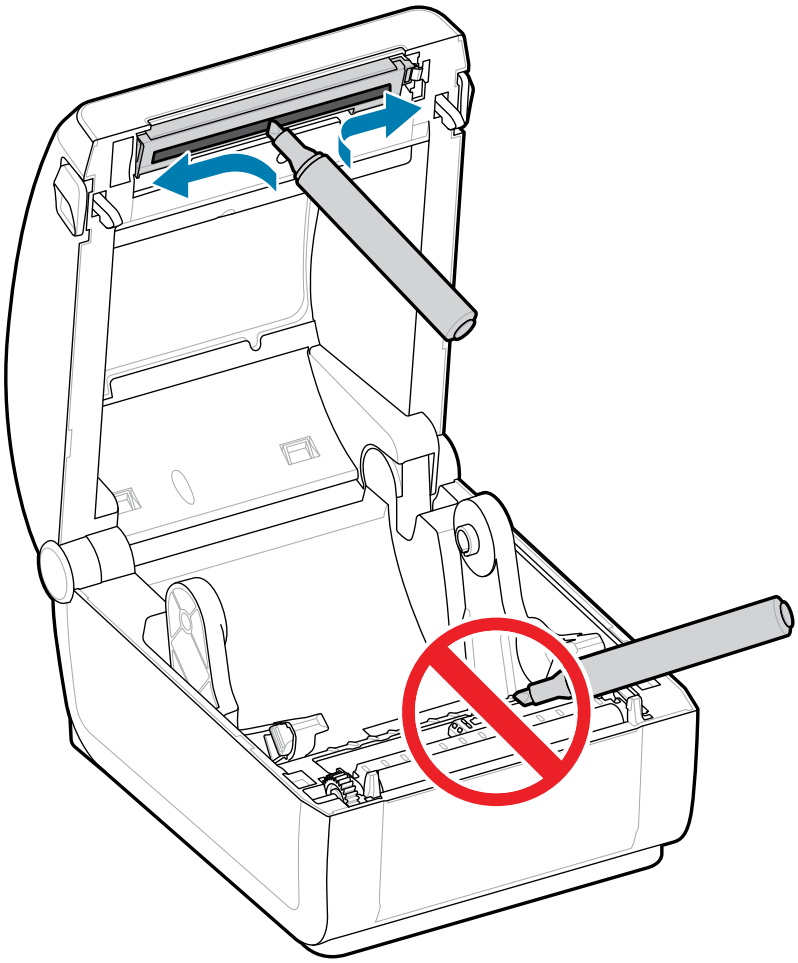
When you load new media, you should also clean the printhead for optimal print operations.

CAUTION: HOT SURFACE! The printhead becomes hot while printing. To avoid damaging the printhead and risking personal injury, AVOID touching the printhead. Use ONLY the cleaning pen to perform printhead maintenance.

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

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 the media to the outside of the media path.



2. Wait one minute before closing the printer to allow all components to dry.

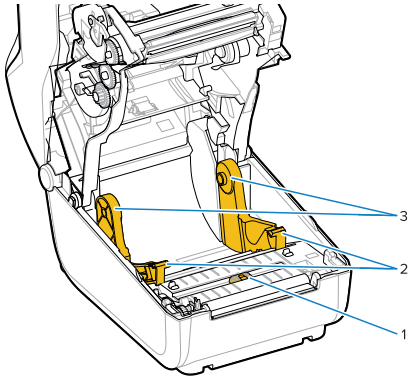
Cleaning the Media Path

Use this procedure to keep the media path clean and free of debris and adhesives.

1. 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.
2. Lightly moisten the cleaning swab or cloth with 90% solution isopropyl alcohol.

NOTE: For hard-to-clean areas, use extra alcohol on a cleaning swab to soak the debris and break up any adhesive that may have accumulated on surfaces in the media compartment.

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



IMPORTANT: DO NOT clean the sensor window (1). Clean only the sensor channel, the groove along which it moves.

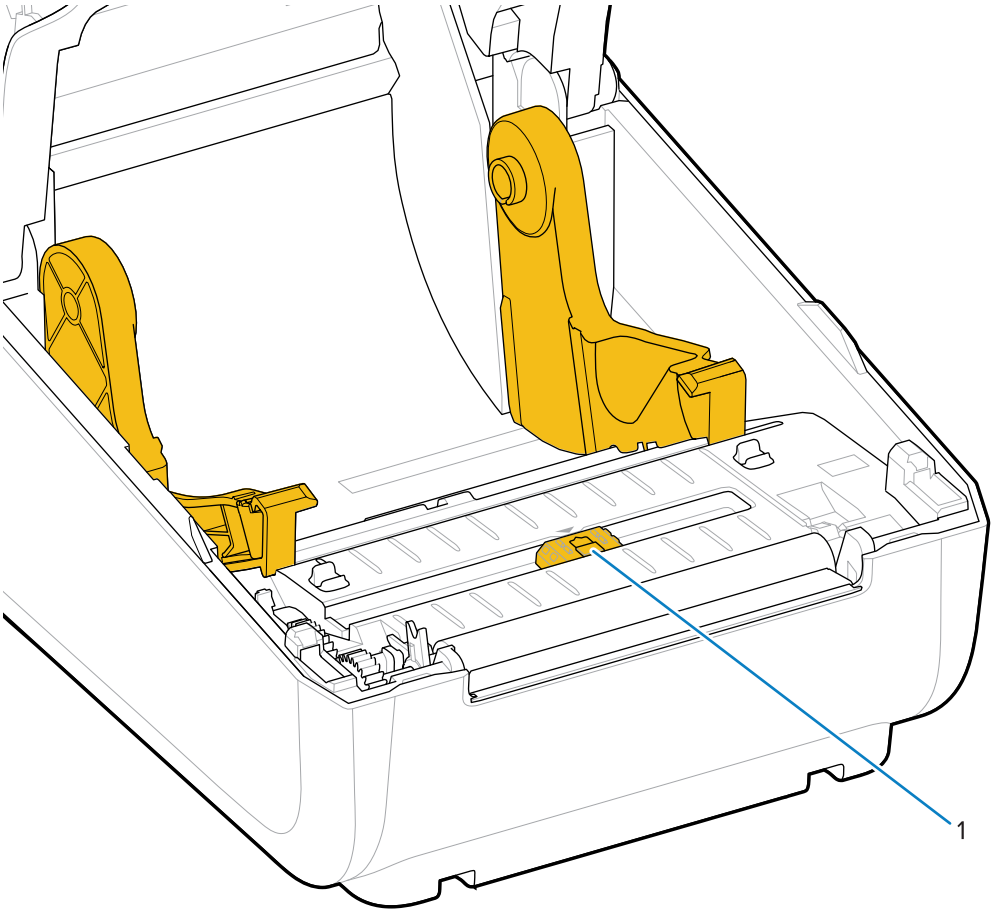
1	Sensor window
2	Media guides
3	Media roll holders

4. To clean the lower half of the printer:
   - **a)** Wipe the inside surfaces of the roll holders and the underside of the media guides with cleaning swabs and wipes.
   - **b)** Wipe only the movable-sensor's slide channel (not the sensor window itself). Move the sensor to access all areas.
   - **c)** Wait one minute for the cleaning solution to dry before closing the printer.
   - **d)** Discard the used cleaning supplies.

Cleaning the Sensor

Dust can accumulate on the media sensors. Use only a can of compressed air to clean the sensors.

This image shows the location of the Movable Sensor for black mark and lower web/gap media.



1. Clean the Movable Sensor's (1) 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 them up.

IMPORTANT: Do NOT use an air compressor to remove dust from the sensor or the inside of the printer. Compressors tend to add moisture, fine grit, and lubricant which can contaminate your printer components and interior.

2. Use a dry swab to remove any residue that may be left from the first cleaning.

3. Repeat the above steps as required until all residue and streaks are removed from the sensor.

Cleaning and Replacing the Platen (Driver Roller)

The platen is the print surface and drive roller for your media. It normally does not require cleaning. Print operations tolerate some accumulation of paper and liner dust on the platen roller.

CAUTION—PRODUCT DAMAGE: 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 off the platen immediately.

Clean the platen (and the media path) whenever the printer exhibits significantly poorer performance, print quality, or media handling. If sticking or jamming continues even after cleaning, you must replace the platen.

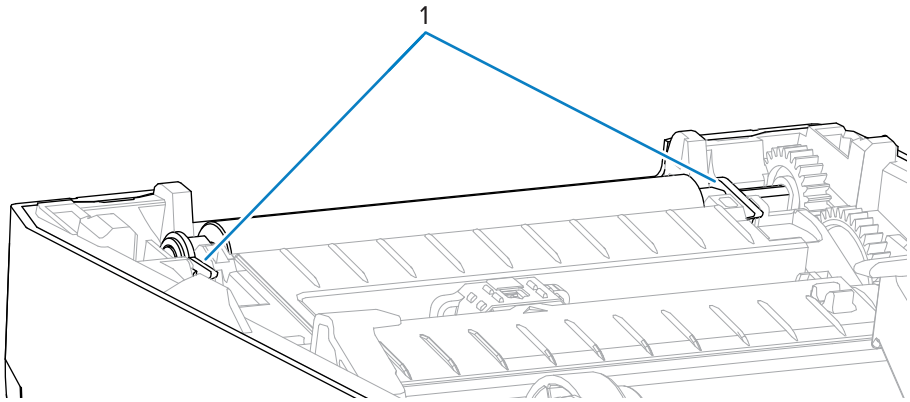
The platen can be cleaned with a fiber-free swab (such as a Texpad swab) or a lint-free, clean, damp cloth very lightly moistened with medical-grade alcohol (90% pure or better) as described in this procedure.

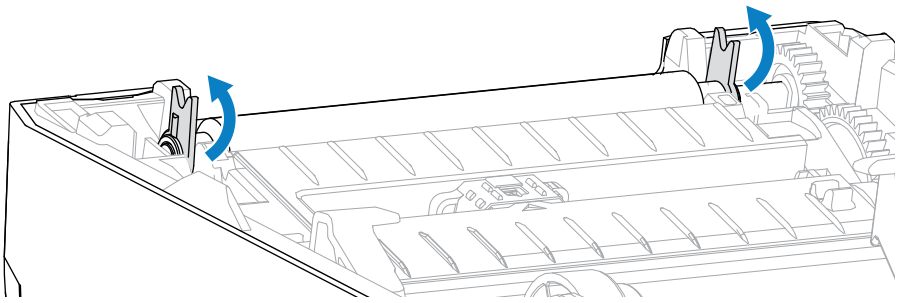
1. To remove the platen roller:

a) Open the cover (and dispenser door, if the dispenser is installed).

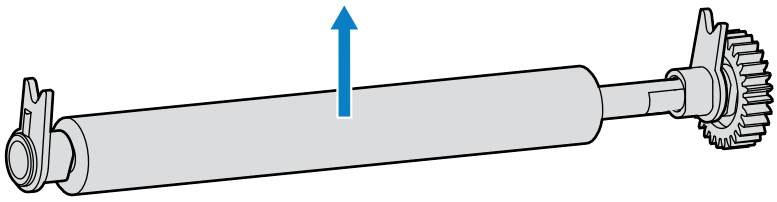
b) Remove media from platen area.

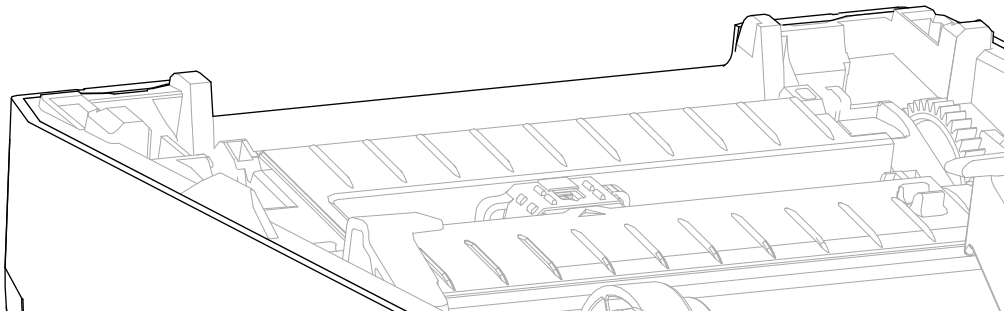
c) Pull the platen-bearing latch-release tabs (1) on the right and left sides towards the front of the printer and rotate them up. (The images with the arrows below show the latches in their closed and open positions, respectively.)



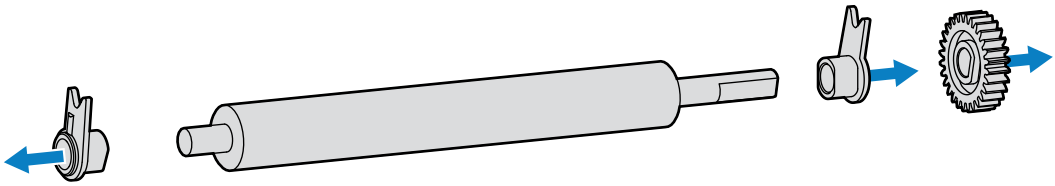


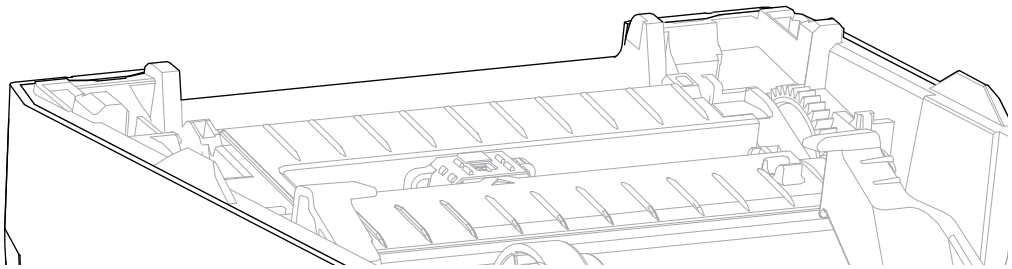
2. Lift the platen out of the printer's bottom frame. (The arrows in this image point to the platen bearings.)



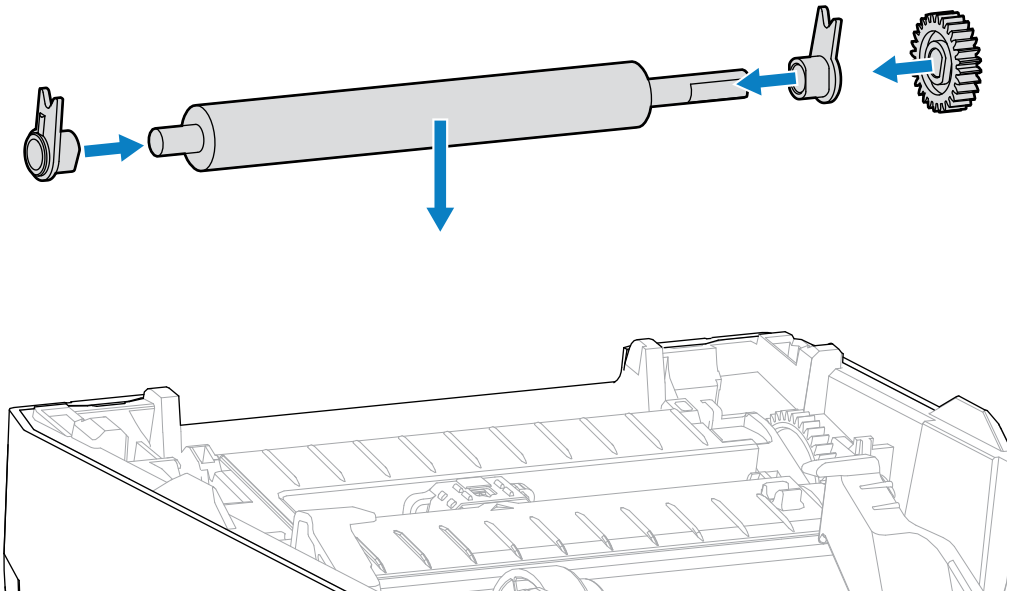


3. Slide the gear and the two bearings off the shaft of the platen roller.





4. Perform this step for cleaning only:
   a) Clean the platen with the alcohol-moistened swab starting from the center and working outwards.
   b) Repeat the above step until the entire roller surface is cleaned thoroughly. While adhesives and oils may be thinned by the initial cleaning, they may not be completely removed.
   c) If there is heavy adhesive build-up or a label jam, use a new swab to remove any residual contaminants.
5. Discard the cleaning swabs after use. Do not reuse them.
6. Ensure the bearings and drive gear are on the shaft of the platen roller.



7. Align the platen with the gear to the left and lower it into the printer's bottom frame.
8. 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.
9. Allow the printer to dry for one minute before closing the dispenser door or media cover and before loading the media.

Updating Printer Firmware

Updating the printer's firmware periodically allows you to benefit from new features, improvements, and printer upgrades related to media handling and printer communications. Use Zebra Setup Utilities (ZSU) to load new firmware.

1. Open Zebra Setup Utilities.
2. Select your installed printer.
3. Click **Open Printer Tools**.

   The Tools window opens.
4. Click the **Action** tab.
5. Load media in the printer (see Media Types and Sensing on page 22).

6. Click **Send file**.

   The lower half of the window shows a filename and path with a **Browse...** button to select the latest firmware file you downloaded from the Zebra website.

7. Wait and observe the user interface.

   If the firmware version shown is different than the version installed on the printer:

   - The firmware download to the printer begins.
   - The printer's STATUS indicator flashes green while the firmware is downloading.
   - The printer restarts and installs the firmware.
   - After a successful firmware update, the printer's STATUS indicator displays solid green, indicating that the firmware was validated and installed.
   - The printer prints a configuration report.

The firmware update is complete.

Other Printer Maintenance

There are no user-level maintenance procedures beyond those detailed in this section.

Troubleshooting

Use the information in this section to troubleshoot printer issues.

Resolving Alerts and Errors

Alert	Possible Cause	Recommended Solution
Media Path		
Printhead Open		
A print command has been issued, or **FEED** was pressed, and the printer detected that the printhead (cover) is not closed.	The cover is open or has not been closed properly.	Close the cover/printhead. Push down on the front top corners of the printer's cover. You should hear and feel the cover latches snap in place to lock the cover closed for printing. (See Opening and Closing the Printer on page 7.) If that does not resolve the issue, contact your Zebra partner or Zebra Tech Support for assistance.
Media Out		
A print command has been issued, **FEED** was pressed, or the printer is printing and cannot detect media in the print path.	No media (roll) in the printer	Load your chosen media in the printer and close the printer. (See Loading the Media on page 24.) You may need to press **FEED** one time or **PAUSE** to get the printer to resume printing.

Alert	Possible Cause	Recommended Solution
	The printer has detected an end-of-media-roll condition either because it is at the end of a roll or there is a label missing between two labels in the middle of the roll. (See Detecting a Media-Out Condition.)	Open the printer. If the media is at the end of the roll, load new media and continue printing. (See Media Types and Sensing on page 22.) **NOTE:** Do NOT turn printer power OFF if it detects a media-out condition in the middle of a roll. The print job will be lost. (See Replacing Supplies while Using the Printer on page 50.) If a label is missing in the middle of the roll: • Close the printer. • Press **FEED** to advance the roll to the next label. • Then press **FEED** again once or twice to resync the label calibration.
	Misaligned movable media sensor	Check the position of the movable media sensor. (See Setting Media Sensing by Media Type on page 23 and Adjusting the Movable Sensor for Black Marks or Notches on page 29.) The printer may need to be recalibrated for the media after adjusting the sensor. (See Running a SmartCal Media Calibration on page 30.)
	The printer is set for non-continuous (labels or black mark) media, but continuous media is loaded.	Make sure that the media sensor is positioned in its default center location. (It may previously have been positioned for black-mark media using Adjusting the Movable Sensor for Black Marks or Notches on page 29. See Setting Media Sensing by Media Type on page 23.) The printer may need to be recalibrated for the media after adjusting the sensor. (See Running a SmartCal Media Calibration on page 30.)

Alert	Possible Cause	Recommended Solution
	Dirty media sensor	**1.** Clean the upper web (gap) Sensor Array and the lower Movable Media sensors. (See Cleaning the Sensor on page 62.) **2.** Reload media in the printer. **3.** Adjust the Movable Media sensor's position for your media. **4.** Close the cover. (See Opening and Closing the Printer). **5.** Recalibrate the printer for the media. (See Running a SmartCal Media Calibration on page 30.)
	The printer is unable to sense the media due either to potential data corruption of memory or to faulty components.	Reload the printer's firmware. (See Updating Printer Firmware on page 66.) If that does not resolve the issue, contact your Zebra partner or Zebra Tech Support for assistance.
Printhead Over Temp		
The printhead is over temperature and paused to allow the printhead to cool.	The printer is printing a large batch job, typically with large amounts of print.	The print operation will resume after the printhead has cooled.
	The ambient temperature at the printer's location exceeds the specified operating range. The printer's ambient temperatures can at times be higher if it is in direct sunlight.	Move the printer location or cool the ambient temperature in the printer's current location.
Printhead Shutdown		
The printhead is below operating temperature for proper printing.	The printhead has had a critical temperature or power failure.	**1.** Turn printer power OFF by holding **POWER** down for five seconds. **2.** Wait for the printer to shutdown completely. Turn printer power ON. If that does not resolve the issue, contact your Zebra partner or Zebra Tech Support for assistance.
Printhead Under Temp		

Alert	Possible Cause	Recommended Solution
The printhead is below operating temperature for proper printing.	The ambient temperature where the printer is located is below the specified operating range.	1. Turn printer power OFF. 2. Move the printer to a different location and wait for it to warm naturally. **NOTE:** Moisture may condense in (and on) the printer if the temperature changes too quickly. For optimal printer operating and storage temperature ranges, see Select a Location for the Printer on page 19.
	The printhead thermistor has failed.	• Turn printer power OFF by holding **POWER** down for five seconds. • Wait for the printer to shutdown completely. • Turn printer power ON. If that does not resolve the issue, contact your Zebra partner or Zebra Tech Support for assistance.

Resolving Print Issues

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

Alert	Possible Cause	Recommended Solution
General Print Quality Issues		
The printed image does not look right.	The printer is set at an incorrect darkness level and/or print speed.	Adjust the printers Darkness setting. (See Adjusting Print Quality on page 51.)
	The printhead is dirty.	Clean the printhead. (See Cleaning the Printhead on page 60.)
	The platen roller is dirty or damaged.	Clean or replace the platen. Platens can wear out or get damaged. (See Cleaning and Replacing the Platen (Driver Roller) on page 63.)
	You may be using the wrong power supply.	Verify you are using the power supply that came with your printer.
	The printhead has worn out.	Contact your Zebra partner or Zebra Tech Support for assistance.
No Print on the Label		

Alert	Possible Cause	Recommended Solution
The printed image does not look right.	The media may not be direct thermal media and is made for the Thermal Transfer mode of printing.	Ensure you are using the right type of media and the right printer settings for the media you are using.
	Media has been loaded incorrectly.	The media printable surface must face up towards the printhead. (See Media Preparation for Printing on page 21 and Media Types and Sensing on page 22.)
Labels Are Distorted in Size or Print Area Start Position Varies		
The printed image or a part of it skips between labels (mis-registration).	Media is loaded incorrectly. OR The movable media sensor is not set properly.	Verify that the sensor is positioned correctly for your media type and its sensing location. See the following: • Media Types and Sensing on page 22 • Setting Media Sensing by Media Type on page 23 • Adjusting the Movable Sensor for Black Marks or Notches on page 29
	The media sensors are not calibrated for your media length, the media's physical properties, or sensing type (gap/notch, continuous, or mark).	See Running a SmartCal Media Calibration on page 30.
	The platen (drive) roller is slipping or damaged.	Clean or replace the platen. Platens can wear out or get damaged. (See Cleaning and Replacing the Platen (Driver Roller) on page 63.
	The printer has communication issues with cables or communication settings.	See Resolving Communication Issues on page 72.

Resolving Communication Issues

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

Alert	Possible Cause	Recommended Solution
Label Job Sent, Data Transfers, But Labels Don't Print		
A label format was sent to the printer but was not recognized.	The prefix and delimiter characters set in the printer do not match the characters in the label format.	Verify the ZPL programming prefix (`COMMAND CHAR`) and delimiter (`DELIM./CHAR`) characters. (See ZPL Printer Configuration Format on page 84.)
Data was transferred to the printer but the printer does not print.	Incorrect data is being sent to the printer.	Check the label format. (See the ZPL Programming Guide for details on printer programming.)

Resolving Miscellaneous Issues

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

Alert	Possible Cause	Recommended Solution
Settings are Lost or Ignored		
Some parameters are set incorrectly.	Printer settings were changed without saving them. (The ZPL ^JU command was not used to save the printer configuration before printer power was turned OFF.)	Cycle printer power OFF and then back ON to verify the settings were saved.
	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 its default setting.	See the ZPL Programming Guide to verify command usage and syntax. (This guide and other online printer support resources are available at zebra.com/zd100-info.)
	The prefix and delimiter characters set in the printer do not match the ones in the label format.	Verify the ZPL programming settings of the Control, Command and Delimiter communication character settings are correct for your system software environment. (See ZPL Configuration on page 84.) Print a Configuration Report (see Test Printing with the Configuration Report on page 31) to ensure these are correct. Compare them to the commands in the label format/form you are trying to print.
	The Main Logic board may not be working properly. Firmware is corrupted or the Main Logic board failed.	1. Do one of the following a. Reset the printer to its factory defaults (see FEED Button Modes – Power ON on page 16). b. Use the Zebra Setup Utility and open **Printer Tools** > **Action** > **Load printer defaults** . 2. Reload printer firmware. (See Updating Printer Firmware on page 66.) If the printer does not recover from this error, contact your Zebra partner or Zebra Tech Support for assistance.

Alert	Possible Cause	Recommended Solution
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.	The printer was not calibrated for the media being used. The printer is configured for continuous media.	• Set the printer for the correct media type (gap/notch, continuous, or mark). • Run a SmartCal Media Calibration. (See Running a SmartCal Media Calibration on page 30.)
Printer Locks Up		
All indicator lights are on and the printer locks up or the printer locks up while restarting.	The printer memory has been corrupted by an unknown event.	Use one of these options to reset the printer to its factory defaults: • Follow the instructions in FEED Button Modes – Power ON on page 16. • Open the Zebra Setup Utility in your central device, then go to **Printer Tools** > **Action** > **Load printer defaults**. • Reload printer firmware. (See Updating Printer Firmware on page 66.) If the printer does not recover from this error, contact your Zebra partner or Zebra Tech Support for assistance.

General Printer Diagnostics

You can diagnose printer issues and get insights into the operating condition of your printer using diagnostic reports, calibration procedures, and other tests.

IMPORTANT: Use full-width media when performing self-tests. If your media is not wide enough, the test labels may print on the platen (drive) roller.

Keep these tips in mind when testing:

- During these self tests, do NOT send data to the printer from the host device. (If your media is shorter than the label to be printed, the test label proceeds to the next label.)
- When canceling a self-test prior to completion, always reset the printer by turning printer power OFF and back ON.

Diagnostic self-tests are enabled by pressing a specific user interface button or combination of buttons while turning printer power ON. Keep the button(s) pressed until the first indicator light turns off. The selected self test automatically starts at the end of the printer's power-on self-test.

Manually Calibrating the Printer

It is recommended that you calibrate the printer manually when using pre-printed media or if the printer will not correctly auto-calibrate when you run a SmartCal procedure.

Make sure media is loaded. A good common label size is 4 by 6 inches.

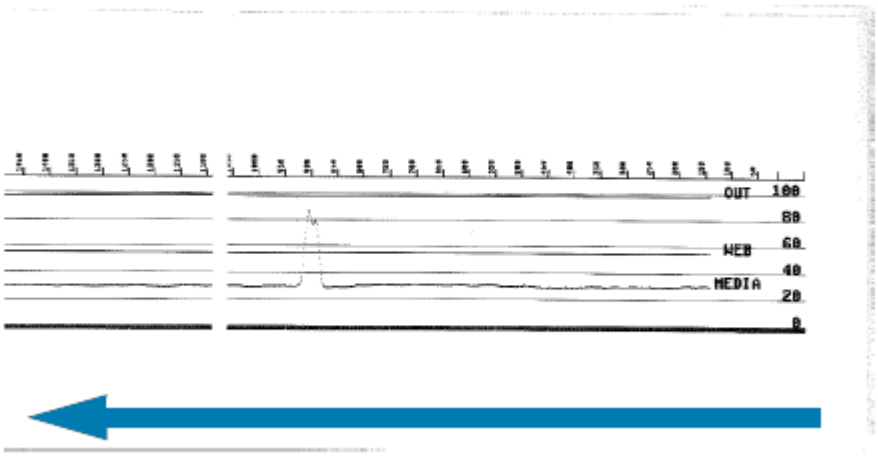
1. Turn printer power ON.

2. Send this command to the printer: `! U1 do "ezpl.manual_calibration" ""`

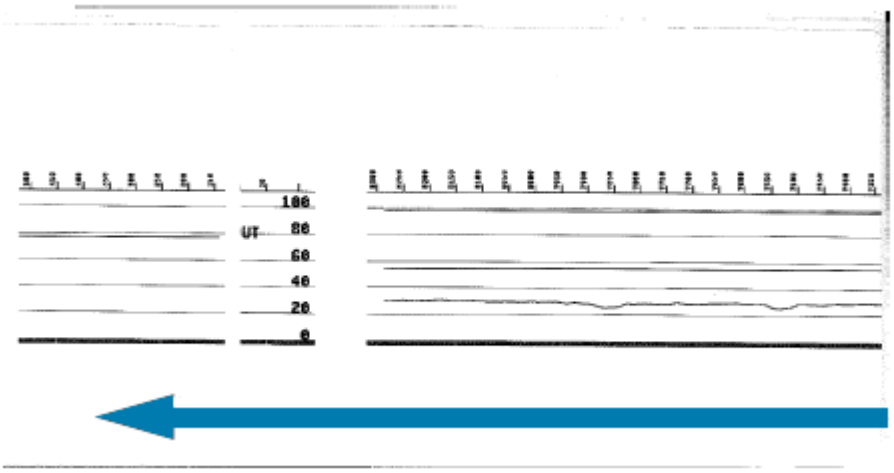
   (See Sending Files to the Printer on page 50.)

The printer will set the media sensor for the label backing in use. When this adjustment is complete, the printer will auto-feed the media roll until a label is positioned at the printhead. It will then print a profile of the media sensor settings (similar to the one shown here). When done, the printer will save the new settings in memory. It is now ready for normal operation.

This image shows the start of several labels (at the right).



This image shows the end of several labels (at the left).



Diagnosing Communication Issues

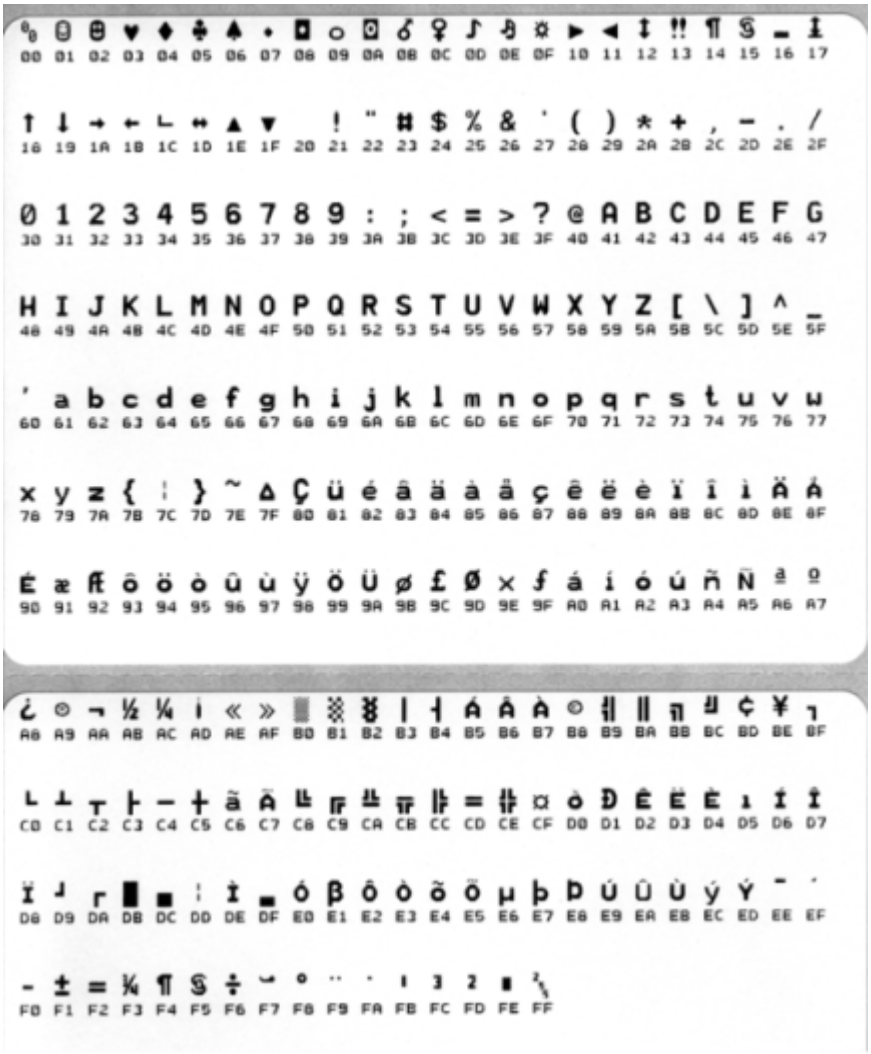
If there is a problem transferring data between the computer and the printer, try placing the printer in Communications Diagnostics mode. The printer will print the ASCII characters and their respective hexadecimal values for any data received from the host computer:

1. To enter diagnostic mode, do one of the following:
   - Send the ZPL ~JD command- to the printer. (See the ZPL Programming Guide.)
   - Send the EPL dump command to the printer. (See the EPL Programming Guide.)
   - Use the **FEED** button after turning printer power ON. (For details, see FEED Button Modes – Power ON on page 16.)

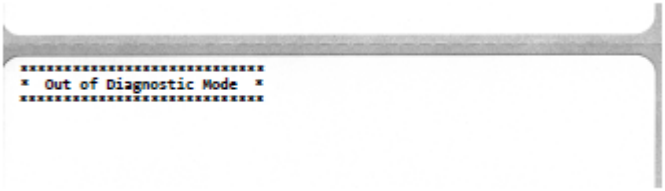
   The printer prints the following:

2. Retrieve the printout and and use the information below to understand the report.

The Communications Diagnostic printout displays hexadecimal data (00h-FFh which is 0-255 decimal) with a specific character for each hexadecimal value displayed above the hexadecimal data.



To exit diagnostic mode and resume printing, turn printer power OFF and then back ON. Alternately, press the **FEED** button as many times as it takes to clear the printer's command buffer and print `Out of Diagnostic mode` on the label.

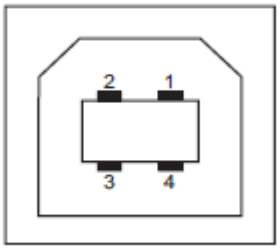


Interface Connector Wiring

This section details the connector wiring for the printer connector interface.

Universal Serial Bus (USB) Interface

This figure shows the cable wiring required to use the printer's USB interface.



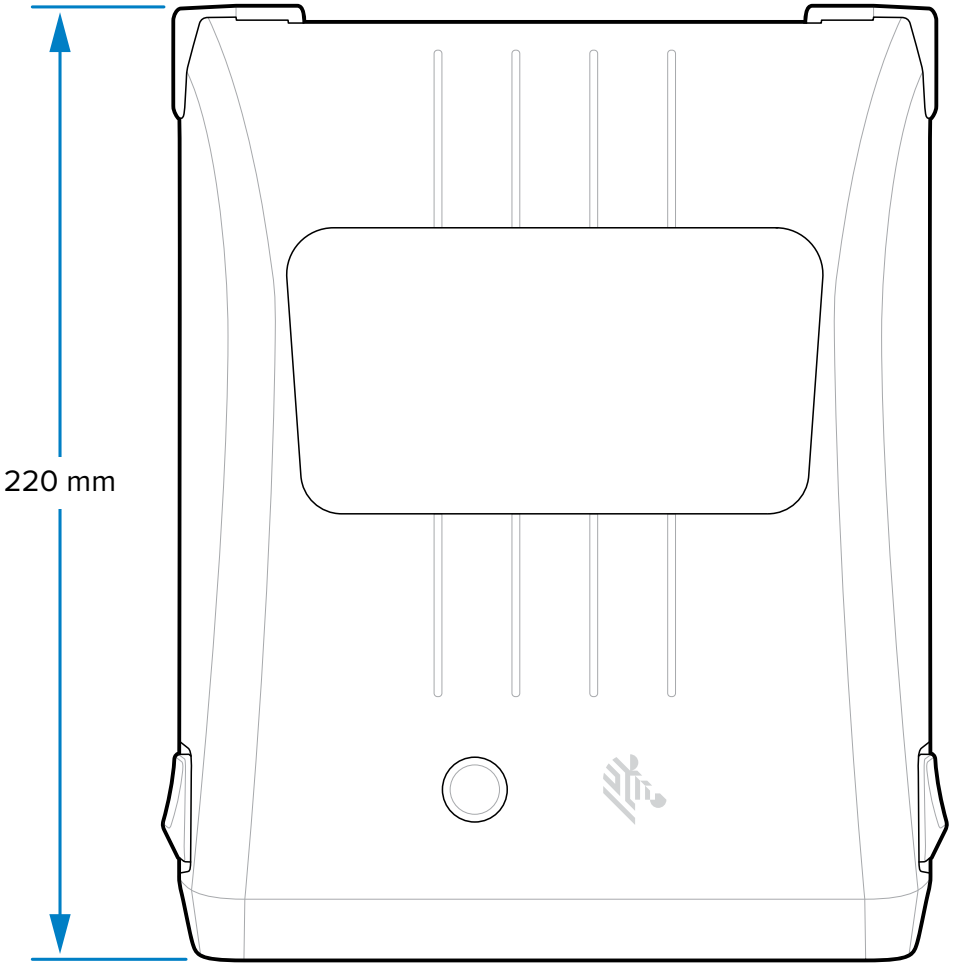
IMPORTANT: When used with third-party cables, your printer requires USB cables—or USB cable packaging—that bears the Certified USB mark to guarantee USB 2.0 compliance. Visit usb.org for details.

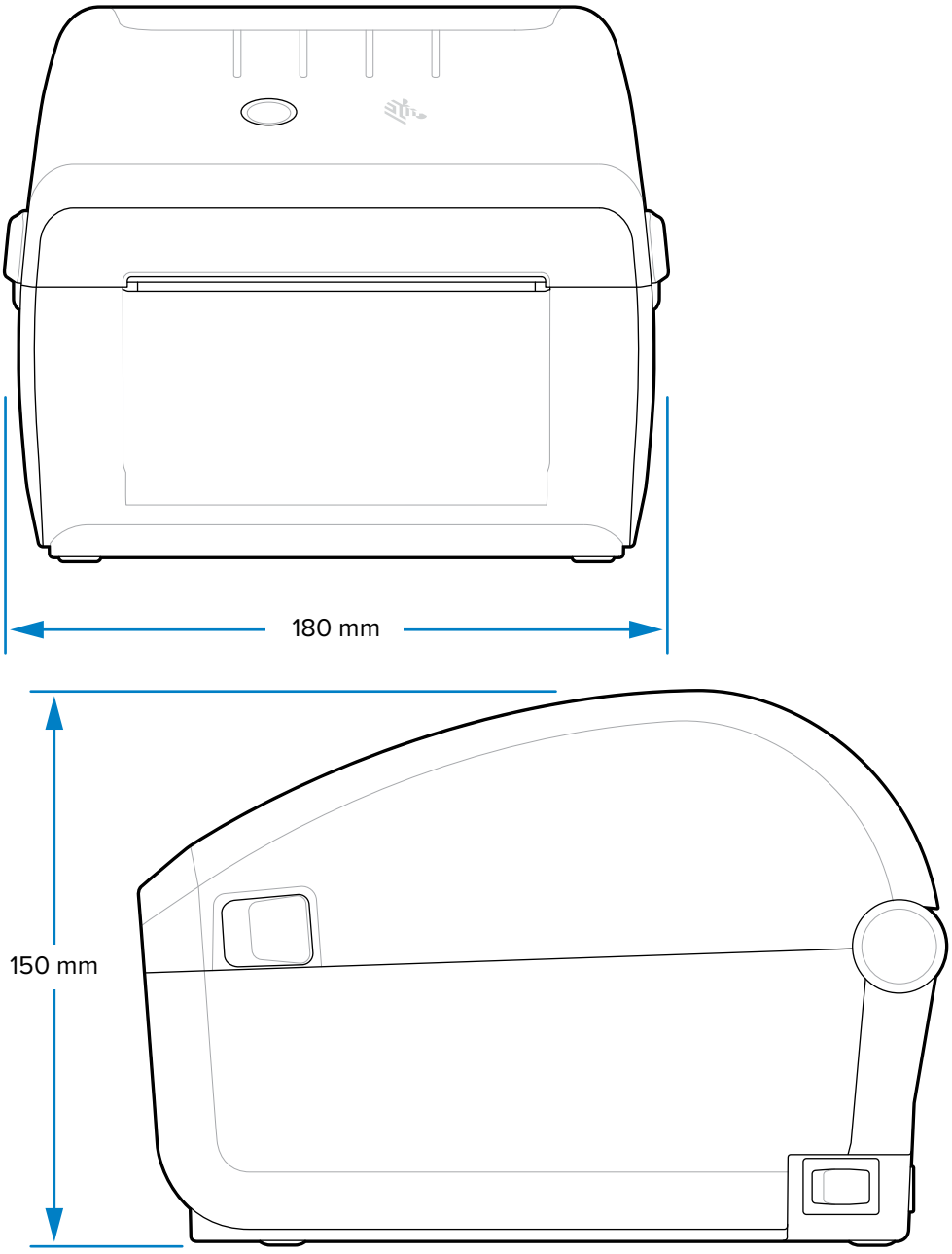
USB B style connector pinouts (in the image shown)	Pin 1 — Vbus (Not Connected) Pin 2 — D- (Data Signal, Negative Side) Pin 3 — D+ (Data Signal, Positive Side) Pin 4 — Shell (Shield/Drain Wire)

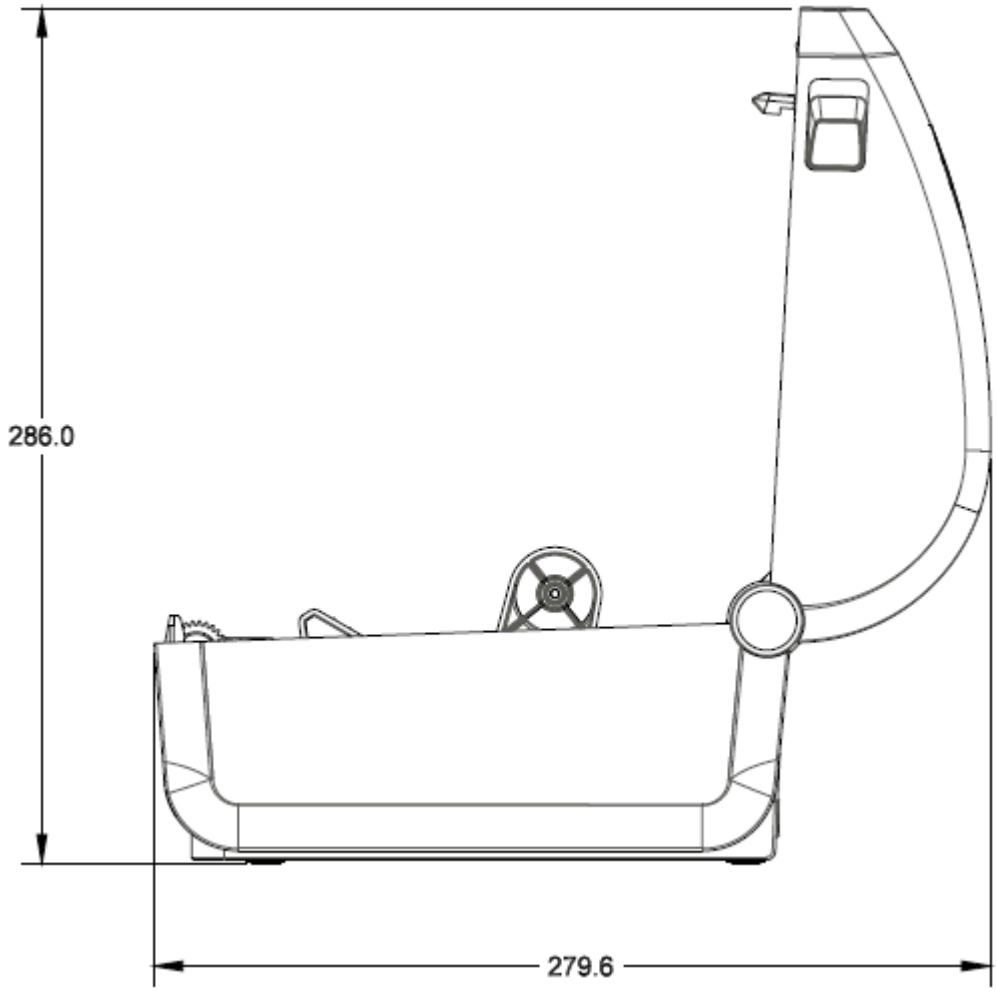
Dimensions

This section lists external printer dimensions.

Standard Printer Dimensions




180 mm
150 mm



All dimensions are in millimeters.

Media

This section provides a simple media overview for your printer.

Thermal Media Types and Procurement

Zebra strongly recommends the use of Zebra-brand supplies in order to ensure consistent high-quality printing.

IMPORTANT: A wide range of Zebra paper, polypropylene, polyester, and vinyl stock has been specifically engineered for Zebra-brand printers to enhance the printing capabilities of your device and prevent premature printhead wear.

To purchase supplies, go to zebra.com/supplies.

Your printer can use the following types of media:

Standard (noncontinuous) media	Most standard (noncontinuous) media uses an adhesive backing that has individual labels or a continuous length of labels affixed onto 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 0.19 mm or 0.0075 in. thick). Tag stock does not have adhesive or a liner, and it is typically perforated between tags.

Types of media rolls and fanfold media include standard or noncontinuous roll media, noncontinuous fanfold media, and continuous roll media.

Your printer typically uses roll media, but also supports fanfold or other continuous media.

General Media and Print Specifications

Media widths	• Direct Thermal mode maximum: 108 mm (4.25 in.) • Minimum for all printers: 15 mm (0.59 in.)
Media length	• Maximum: 990 mm (39 in.) • Minimum 25.4 mm (1.0 in.)
Media thickness	• Maximum: 0.1905 mm (0.0075 in.) • Minimum: 0.06 mm (0.0024 in.)
Media Roll Outer Diameter (O.D.)	127 mm (5.0 in.)

Media Roll Core Inner Diameter (I.D.)	• Standard roll configuration:
	  • 12.7 mm (0.5 in.) I.D.
	  • 25.4 mm (1 in.) I.D.
	• With optional media roll adapter: 38.1 mm (1.5 in.) I.D.

Dot pitch	203 dpi: 0.125 mm (0.0049 in.)
Barcode modulus x-dim	203 dpi: 0.005-0.050 in.

ZPL Configuration

This section provides an overview of managing printer configuration, the Configuration Status report, and printer and memory printouts.

Managing the ZPL Printer Configuration

Printers that support ZPL 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.

These settings will remain in effect until:

- they are changed by subsequent commands,
- the printer is reset,
- printer power is cycled (turned on and off), or
- you restore a parameter that has a factory default by resetting the printer to its defaults.

You can save and restore printer configurations using the ZPL Configuration Update command (^JUS). This command initializes (or re-initializes) the printer with pre-configured settings.

- To retain the current settings after the printer is reset or the power is cycled, send the ^JUS ZPL command to the printer to save all current persistent settings.
- To restore the last-saved values to the printer, use the ^JUR command.

ZPL stores all parameters when you issue the ^JUS command. The legacy EPL programming language (supported by your ZD Series 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 using either printer language.

To help manage your printer, you can instruct the printer to print a Configuration Report. The report lists operating parameters, sensor settings, and printer status among other details (see Managing the ZPL Printer Configuration on page 84). You can also print this and other reports using the Zebra Setup Utility and the ZebraDesigner Windows driver.

ZPL Printer Configuration Format

You can manage more than one printer easily by creating a printer configuration programming file to send to all of them. Alternatively, you can use ZebraNet Bridge to clone a printer's setup.

The basic structure of a ZPL programming configuration file is as follows:

^XA	Start Format Command
	Format commands are case sensitive. (a) General print and command settings (b) Media handling and behaviors Media print size ^JUS command to save
^XZ	End Format Command

See the ZPL Programming Guide and the Configuration Setting to Command Cross-reference to create a programming file using the appropriate commands you need for the task at hand.

Zebra Setup Utilities (ZSU) can be used to send programming files to the printer. Windows Notepad (text editor) can be used to create programing files.

Configuration Setting to Command Cross-Reference

The Printer Configuration Report lists a majority of the configurations settings that can be set by sending ZPL commands to the printer.

For information on these commands, see the ZPL Programming Guide available from zebra.com.

```
                PRINTER CONFIGURATION

Zebra Technologies
ZTC ZD100-203dpi ZPL
DNV243200057

+10.0.............. DARKNESS
6 IPS.............. PRINT SPEED
+000............... TEAR OFF ADJUST
TEAR OFF........... PRINT MODE
GAP/NOTCH.......... MEDIA TYPE
TRANSMISSIVE....... SENSOR SELECT
832................ PRINT WIDTH
1242............... LABEL LENGTH
15.0IN   380MM..... MAXIMUM LENGTH
MAINT. OFF......... EARLY WARNING
CONNECTED.......... USB COMM.
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
053................ WEB SENSOR
096................ MEDIA SENSOR
067................ MARK SENSOR
012................ MARK MED SENSOR
033................ TRANS GAIN
019................ TRANS LED
054................ MARK GAIN
050................ MARK LED
DPCSWFXM........... MODES ENABLED
.................. MODES DISABLED
832 8/MM FULL...... RESOLUTION
V102.01.05ZP2549<-. FIRMWARE
1.3................ XML SCHEMA
1.0.0.............. HARDWARE ID
2048k.............R: RAM
4864k.............E: ONBOARD FLASH
NONE............... FORMAT CONVERT
FW VERSION......... IDLE DISPLAY
12/02/24........... RTC DATE
18:27.............. RTC TIME
805 LABELS......... NONRESET CNTR
805 LABELS......... RESET CNTR1
805 LABELS......... RESET CNTR2
6,772 IN........... NONRESET CNTR
6,772 IN........... RESET CNTR1
6,772 IN........... RESET CNTR2
17,201 CM.......... NONRESET CNTR
17,201 CM.......... RESET CNTR1
17,201 CM.......... RESET CNTR2
FIRMWARE IN THIS PRINTER IS COPYRIGHTED
```

The sensor settings shown in this image, for example, are used for service purposes.

Table 1 ZPL Commands and Configuration Report Callout Cross-Reference

Command	Listing Name	Default (or description)
^SD	DARKNESS	10.0
^PR	PRINT SPEED	• 101.6 mm/s / 4 ips • 152.4 mm/s / 6 ips (maximum)
^TA	TEAR OFF	+000
^MN	MEDIA TYPE	GAP/NOTCH
	SENSOR SELECT	AUTO (^MNA - Auto-Detect)
^PW	PRINT WIDTH	832 (dots for 203 dpi)
^LL	LABEL LENGTH	1230 (dots) (dynamically updated while printing)
^ML	MAXIMUM LENGTH	989 mm (39.0 in.)
—	USB COMM.	(Connection Status: Connected / Not Connected)
— SGD —**	COMMUNICATIONS	NORMAL MODE
^CT / ~CT	CONTROL CHAR	<~> 7EH
^CC / ~CC	COMMAND CHAR	<^> 5EH
^CD / ~CD	DELIM./CHAR	<,> 2CH
^SZ	ZPL MODE	ZPL II
— SGD —	COMMAND OVERRIDE **NOTE:** Not supported with a ZPL command. Uses the Set-Get-Do command listed in the ZPL manual. (See device.command_override.xxxxx in the ZPL Programming Guide.)	INACTIVE
^MFa	MEDIA POWER UP	NO MOTION
^MF,b	HEAD CLOSE	FEED
~JS	BACKFEED	DEFAULT
^LT	LABEL TOP	+000
^LS	LEFT POSITION	+0000
	REPRINT MODE	DISABLED

From this point in the Configuration Receipt listing, the printout lists sensor settings and values which can be used to troubleshoot sensor and media operations. These are typically used by Zebra Tech Support to diagnose printer problems.

The configuration settings listed here resume after the TAKE LABEL sensor value. This listing includes commands that are:

- used to generate status information or commands, or
- relate to printer features whose settings are seldom changed from their defaults.

Table 2 ZPL Commands and Configuration Receipt Callout Cross-Reference

Command	Listing Name	Description
^MP	MODES ENABLED	Default: DPCSWFXM (See ^MP Command)
	MODES DISABLED	(No default set)
^JM	RESOLUTION	Default: 832 8/mm (203 dpi)
—	FIRMWARE	Lists ZPL Firmware Version
—	XML SCHEMA	1.3
—	HARDWARE ID	Lists Firmware Boot-block Version
—	CONFIGURATION	CUSTOMIZED (after first use)
—	RAM	2048k..... R:
—	ONBOARD FLASH	4864k.....E:
^MU	FORMAT CONVERT	NONE
	RTC DATE	Date Displayed
	RTC TIME	Time Displayed
	NONRESET CNTR0 (1, 2)	X,XXX IN
	RESET CNTR1	X,XXX IN
	RESET CNTR2	X,XXX IN

The printer can set a command or a group of commands at one time for all receipts or labels that follow. Those settings remain in effect until:

- they are changed by subsequent commands
- the printer is reset, or
- you restore the printer to its factory defaults.

Printer Memory Management and Related Status Reports

To help you manage printer resources, your printer supports a variety of format commands.

Use these commands to:

- manage memory.
- transfer objects (between memory areas, import and export).
- name objects.
- output various printer operating status reports.

These commands are very similar to the old DOS commands such as DIR (directory listing) and DEL (delete file). The most common reports are also part of the Zebra Setup Utility and ZebraDesigner Windows driver.

It is recommended you issue a single command within this type of format (form) for ease of reuse as a maintenance and development tool.

^XA	Start Format command
	A single format command for ease of reuse.
^XZ	End Format command

Many of the commands that transfer objects, and manage/report on memory are control commands (~). They need not be within a format (form). They will be processed immediately after they are received by the printer, whether in a format (form) or not.

ZPL Programming for Memory Management

The ZPL programming language has various printer memory locations that are used to run the printer, assemble the print image, and store formats (forms), graphics, fonts, and configuration settings.

- ZPL treats formats (forms), fonts, and graphics similar to the way it treats files. It treats memory locations like disk drives in the DOS operating system environment.
  - Memory Object Naming supports up to 16 alphanumeric characters followed by a three alphanumeric-character file extension (for example: `123456789ABCDEF.TTF`).
- Allows moving objects between memory locations and deleting objects.
- Supports DOS directory style file-list reports as printouts or status to the central device or host computer.
- Allows use of wildcards (*) for file access.

Glossary

A list of terms used in this guide are defined here.

alphanumeric

Indicating letters, numerals, and characters such as punctuation marks.

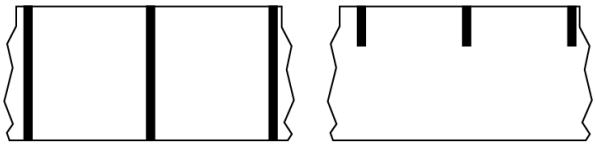
backfeed

When the printer pulls the media and ribbon (if used) backward into the printer so that the beginning of the label to be printed is properly positioned behind the printhead. Backfeed occurs when operating the printer in Tear-Off and Applicator modes.

barcode

A code by which alphanumeric characters can be represented by a series of adjacent stripes of different widths. Many different code schemes exist, such as the universal product code (UPC) or Code 39.

black mark media



Media with registration marks found on the underside of the print media that act as start-of-label indications for the printer. The reflective media sensor is the generally-selected option for use with black mark media.

Contrast this with continuous media on page 91 or gap/notch media on page 93.

calibration (of a printer)

A process in which the printer determines some basic information needed to print accurately with a particular media and ribbon combination. To do this, the printer feeds some media and (if using non-continuous media) the length of individual labels or tags.

collection method

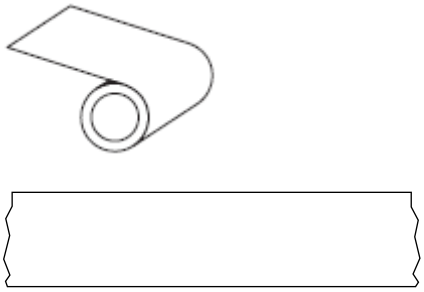
Select a media collection method that is compatible with your printer options. Selections include tear-off, peel-off, cutter, and rewind. The basic media and ribbon loading instructions are the same for all collection methods with some additional steps necessary for using any media collection options.

configuration

The printer configuration is a group of operating parameters specific to the printer application. Some parameters are user selectable, while others are dependent on the installed options and mode of operation. Parameters may be switch selectable, control panel programmable, or downloaded as ZPL II commands. A configuration label listing all the current printer parameters may be printed for reference.

continuous media

Label or tag-stock media that does not have gaps, holes, notches, or black marks to indicate label separations. The media is one long piece of material wound into a roll. This allows the image to be printed anywhere on the label.



A transmissive (gap) sensor is typically used for the printer to detect when the media runs out.

Contrast this with black mark media on page 90 or gap/notch media on page 93.

core diameter

The inside diameter of the cardboard core at the center of a roll of media or ribbon.

diagnostics

Information about which printer functions are not working that is used for troubleshooting printer problems.

die-cut media

A type of label stock that has individual labels stuck to a media liner. The labels may be lined up against each other or separated by a small distance. Typically the material surrounding the labels has been removed. (See non-continuous media on page 95.)

direct thermal

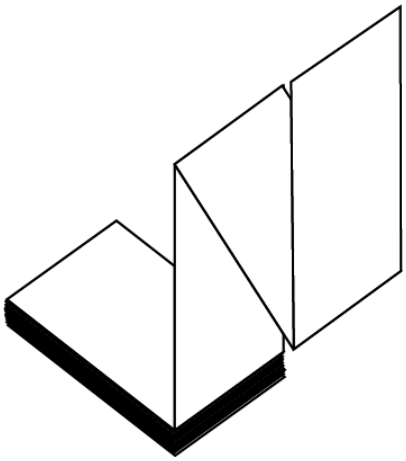
A printing method in which the printhead presses directly against the media. Heating the printhead elements causes a discoloration of the heat-sensitive coating on the media. By selectively heating the printhead elements as the media moves past, an image is printed onto the media. No ribbon is used with this printing method.

Contrast this with thermal transfer on page 99.

direct thermal media

Media that is coated with a substance that reacts to the application of direct heat from the printhead to produce an image.

fanfold media



Non-continuous media that comes folded in a rectangular stack and folded in a zigzag pattern. Fanfold media is either gap-notch media or black mark media, meaning it uses black marks or notches to track media format positioning.

Fanfold media can have the same label separations as non-continuous roll media. The separations fall either on or near the folds.

Contrast this with roll media on page 98.

firmware

This is the term used to specify the printer's operating program. This program is downloaded to the printer from a host computer and stored in flash memory. Each time the printer power is turned on, this operating program starts. This program controls when to feed the media forward or backward and when to print a dot on the label stock.

FLASH memory

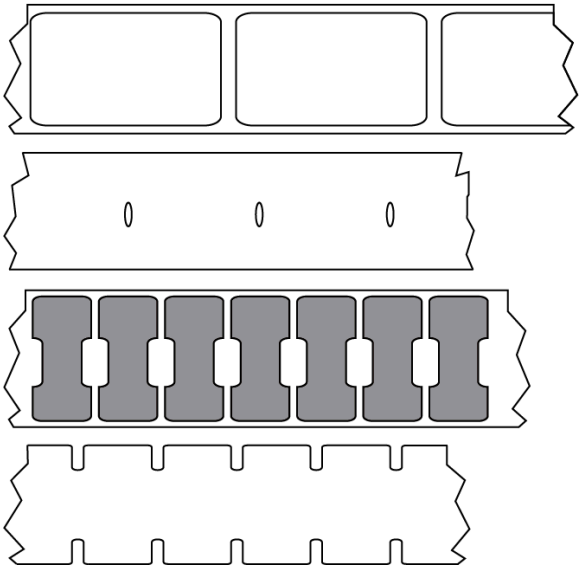
Non-volatile memory that maintains the stored information intact when power is off. This memory area is used to store the printer's operating program. Can also be used to store optional printer fonts, graphic formats, and complete label formats.

font

A complete set of alphanumeric characters in one style of type. Examples include CG Times™, CG Triumvirate Bold Condensed™.

gap/notch media

Media that contains a separation, notch, or hole, indicating where one label/printed format ends and the next begins.



Contrast this with black mark media on page 90 or continuous media on page 91.

ips (inches-per-second)

The speed at which the label or tag is printed. Many Zebra printers can print from 1 ips to 14 ips.

label

An adhesive-backed piece of paper, plastic, or other material on which information is printed. A non-continuous label has a defined length, as opposed to a continuous label or a receipt which can have a varying length.

label backing (liner)

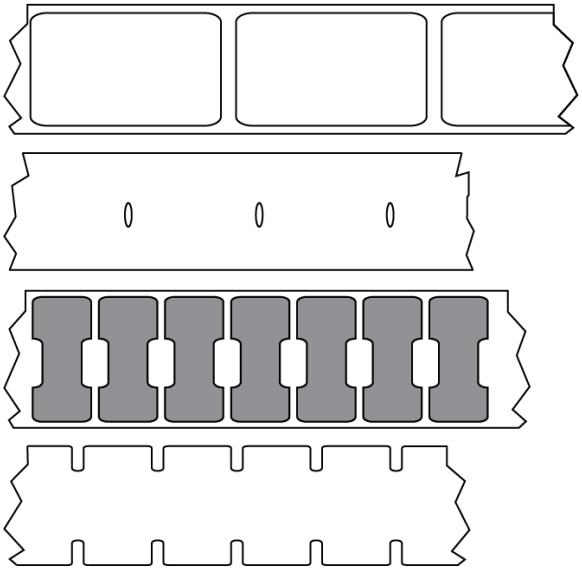
The material on which labels are affixed during manufacture and which is discarded or recycled.

label type

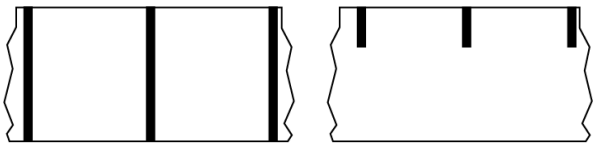
The printer recognizes the following label types.

Continuous

Gap/Notch



Mark



LCD (liquid crystal display)

A backlit display that provides the user with either operating status during normal operation or option menus when configuring the printer to a specific application.

LED (light emitting diode)

Indicators of specific printer status conditions. Each LED is either off, on, or blinking depending on the feature being monitored.

linerless media

Linerless media does not use backing to keep the layers of labels on a roll from sticking to one another. It is wound like a roll of tape, with the sticky side of one layer in contact with the non-sticky surface of the one below it.

Depending on the printer, individual labels may be separated by perforations, or they can be cut apart with a linerless cutter. Because there is no liner, more labels can potentially fit on a roll, cutting down the need to change media as often.

Linerless media is considered an environmentally friendly option because no backing is wasted, and the cost per label can be less than that of standard labels.

Zebra recommends using Zebra ZeroLiner direct thermal linerless media.

mark media

See black mark media on page 90.

media

Material onto which data is printed by the printer. Types of media include: tag stock, die-cut labels, continuous labels (with and without media liner), non-continuous media, fanfold media, and roll media.

media sensor

This sensor is located behind the printhead to detect the presence of media and, for non-continuous media, the position of the web, hole, or notch used to indicate the start of each label.

media supply hangar

The stationary arm that supports the media roll.

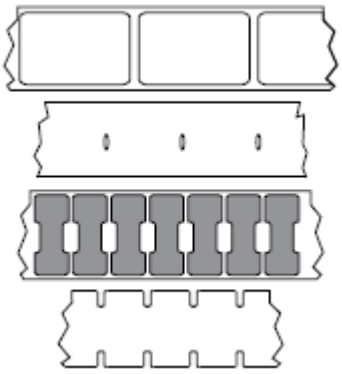
non-continuous media

Media that contains an indication of where one label/printed format ends and the next one begins. Types of non-continuous media include gap-notch media and black mark media. (Contrast this with continuous media.)

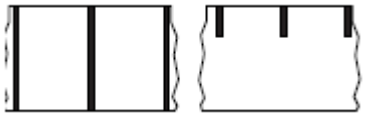
Non-continuous roll media usually comes in the form of labels with an adhesive backing on a liner. Tags (or tickets) are separated by perforations.

Individual labels or tags are tracked and position-controlled using one of these methods:

- Web media separates labels by gaps, holes, or notches.



- Black mark media uses pre-printed black marks on the back side of the media to indicate label separations.



- Perforated media has holes—to allow the labels or tags to be separated from each other easily—along with position-control marks, notches, or label gaps.

non-volatile memory

Electronic memory that retains data even when the power to the printer is turned off.

notched media

A type of tag stock containing a cutout area that can be sensed as a start-of-label indicator by the printer. This is typically a heavier, cardboard-like material that is either cut or torn away from the next tag. See gap/notch media on page 93.

peel-off mode

A mode of operation in which the printer peels a printed label away from the backing and allows the user to remove it before another label is printed. Printing pauses until the label is removed.

perforated media

Media with perforations that allow the labels or tags to be separated from each other easily. The media may also have black marks or other separations between labels or tags.

print speed

The speed at which printing occurs. For thermal transfer printers, this speed is expressed in terms of inches per second (ips).

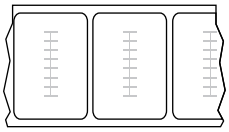
print type

The print type specifies whether the type of media being used requires ribbon to print. Thermal transfer media requires ribbon while direct thermal media does not.

printhead wear

The degradation of the surface of the printhead and/or the print elements over time. Heat and abrasion can cause printhead wear. Therefore, to maximize the life of the printhead, use the lowest print darkness setting (sometimes called burn temperature or head temperature) and the lowest printhead pressure necessary to produce good print quality.

Radio frequency identification (RFID) "smart" media



Each RFID label has an RFID transponder (sometimes called an "inlay"), made of a chip and an antenna, embedded between the label and the liner. The shape of the transponder varies by manufacturer and is visible through the label. All "smart" labels have memory that can be read, and many have memory that can be encoded.

RFID media can be used in a printer that is equipped with an RFID reader/encoder. RFID labels are made from the same materials and adhesives as non-RFID labels.

receipt

A receipt is a variable length printout. One example of a receipt is in retail stores, where each purchased item occupies a separate line on the printout. Therefore, the more items purchased, the longer the receipt.

registration

Alignment of printing with respect to the top (vertical) or sides (horizontal) of a label or tag.

ribbon

Ribbon is a thin film that is coated on one side with wax, resin, or wax resin (usually called ink), which is transferred to the media during the thermal transfer process. Ink is transferred onto the media when heated by the small elements within the printhead.

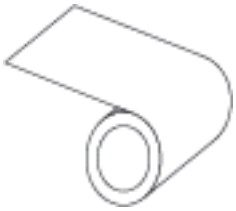
Ribbon is only used with the thermal transfer print method. Direct thermal media does not use ribbon. When ribbon is used, it must be as wide as or wider than the media being used. If the ribbon is narrower than the media, areas of the printhead are unprotected and subject to premature wear. Zebra ribbons have a coating on the back that protects the printhead from wear.

ribbon wrinkle

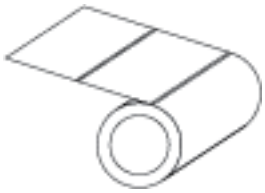
A wrinkling of the ribbon caused by improper alignment or improper printhead pressure. This wrinkle can cause voids in the print and/or the used ribbon to rewind unevenly. This condition should be corrected by performing adjustment procedures.

roll media

Media that comes supplied rolled onto a core (usually cardboard). It can be continuous (no separations between labels)



or non-continuous (some type of separation between labels).



Contrast this with fanfold media on page 92.

supplies

A general term for media and ribbon.

symbology

The term generally used when referring to a barcode.

tag stock

A type of media having no adhesive backing but featuring a hole or notch by which the tag can be hung on something. Tags are usually made of cardboard or other durable material and are typically perforated between tags. Tag stock can come on rolls or in a fanfold stack. (See gap/notch media on page 93.)

tear-off mode

A mode of operation in which the user tears the label or tag stock away from the remaining media by hand.

thermal transfer

A printing method in which the printhead presses an ink or resin coated ribbon against the media. Heating the printhead elements causes the ink or resin to transfer onto the media. By selectively heating the printhead elements as the media and ribbon move past, an image is printed onto the media.

Contrast this with direct thermal on page 92.

void

A space on which printing should have occurred, but did not due to an error condition such as wrinkled ribbon or faulty print elements. A void can cause a printed barcode symbol to be read incorrectly or not at all.