



# QLn Series™



## Mobile Printers

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## User Guide

P1028026-005 Rev. A



**ULINE**

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# Document Conventions

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

## Cautions, Important, and Note



---

**Caution • Warns you of the potential for electrostatic discharge.**

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**Caution • Warns you of a potential electric shock situation.**

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

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

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

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

---



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

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# Introduction to the QLn™ Series Printers

Thank you for choosing our Zebra® QLn™ Series Mobile Printers. You will find these rugged printers will become a productive and efficient addition to your workplace thanks to their innovative design and state of the art features. Zebra Technologies is the leader in industrial printers with world-class support for all of your bar code printers, software, and supplies.

This user's guide gives you the information you will need to operate the QLn420, QLn320, and QLn220 printers, including QLn Healthcare and Made for iPhone® (MFi) printers. MFi printers provide Apple co-processor (MFi) support which allows an Apple device such as an iPhone or iPad® to authenticate and connect over Bluetooth®.



These printers use CPCL and ZPL programming languages. To create and print labels using the CPCL and ZPL languages, refer to the Programming Guide for CPCL and ZPL (p/n P1012728-008). See Appendix G for instructions on how to access manuals on [zebra.com](http://zebra.com).

## QLn Series Software Utilities:

- Zebra Net Bridge™ : printer configuration, fleet management
- Zebra Setup Utility: single printer configuration, quick set-up
- Zebra Designer Pro: label design
- Zebra Designer Drivers: Windows® driver
- OPOS Driver: Windows driver
- Multiplatform SDK

(These utilities can be found on the Zebra website at <http://www.zebra.com/us/en/support-downloads.html>. See Appendix G.)

# Unpacking and Inspection

- Check all exterior surfaces for damage.
- Open the media cover (refer to “Loading the Media” in the Getting Ready to Print section) and inspect the media compartment for damage.

In case shipping is required, save the carton and all packing material.

# Reporting Damage

If you discover shipping damage:

- Immediately notify and file a damage report with the shipping company. Zebra Technologies Corporation is not responsible for any damage incurred during shipment of the printer and will not cover the repair of this damage under its warranty policy.
- Keep the carton and all packing material for inspection.
- Notify your authorized Zebra re-seller.

# QLn Series Technology

The QLn420, QLn320 and QLn220 use several technologies made popular in other Zebra Mobile Printer product lines, as well as newer technologies.

# Smart Battery

The QLn Series battery pack is a high capacity, smart Lithium Ion battery that contains electronics which allow the printer to monitor its operating parameters. Among these are the number of charge cycles it has undergone and its date of manufacture. Using these parameters, the printer’s software can monitor the battery’s condition and alert the user when to recharge or remove the battery from service.

Operating Temperature	Charging Temperature	Storage Temperature
-20°C to +55°C (-4°F to 131°F)	0°C to +40°C (32°F to 104°F)	-25°C to +65°C (-13°F to 149°F)



*The QLn Series printers will only function properly with genuine Zebra smart battery packs.*

The smart battery's health has three states: GOOD, REPLACE, and POOR. The battery health factor determines whether or not the printer can operate and what is communicated to the user via the display.

# of Charge Cycles	Health	Power-up Message
<300	GOOD	None
≥300 but <550	REPLACE	"Battery Diminished Consider Replacing" *
≥550 but <600	REPLACE	"Warning-Battery Is Past Useful Life" *
≥600	POOR	"Replace Battery Shutting Down" **

**\* Warning accompanied by one long beep.**

**\*\* Warning will flash on and off accompanied by beeping at a rate of once per second. After 30 seconds the printer will shut down.**



**Note • Power down the printer before removing the battery to minimize the risk of corruption.**

---

## Printing Technology

The QLn Series printers use the Direct Thermal method to print human readable text, graphics and barcodes. It incorporates a sophisticated print engine for optimal printing under all operational conditions.

### Direct Thermal

Direct thermal printing uses heat to cause a chemical reaction on specially treated media. This reaction creates a dark mark wherever a heated element on the printhead comes in contact with the media. Since the printing elements are arranged very densely at 203 d.p.i. (dots per inch) horizontal and 200 d.p.i. vertical, highly legible characters and graphic elements may be created a row at a time as the media is advanced past the printhead. This technology has the advantage of simplicity, as there is no requirement for consumable supplies such as ink or toner. However, since the media is sensitive to heat, it will gradually lose legibility over long periods of time, especially if exposed to environments with relatively high temperatures.

## QR Code

The QR barcode includes human readable text (URL) which links the user to printer information and short videos on topics such as buying supplies, features overview, loading media, printing a configuration report, cleaning instructions, and accessory information. (See Page 13 for each printer's URL address.)

## Made for iPhone (MFi)

QLn printers support communication with Apple devices running iOS 5 or later over a standalone Bluetooth 3.0 radio and the BT3.0 radio included with the 802.11n (dual) radio. Only printers with the "M" in the ninth digit spot of the part number support this feature, i.e. QNx-xxxxxMxx-xx.

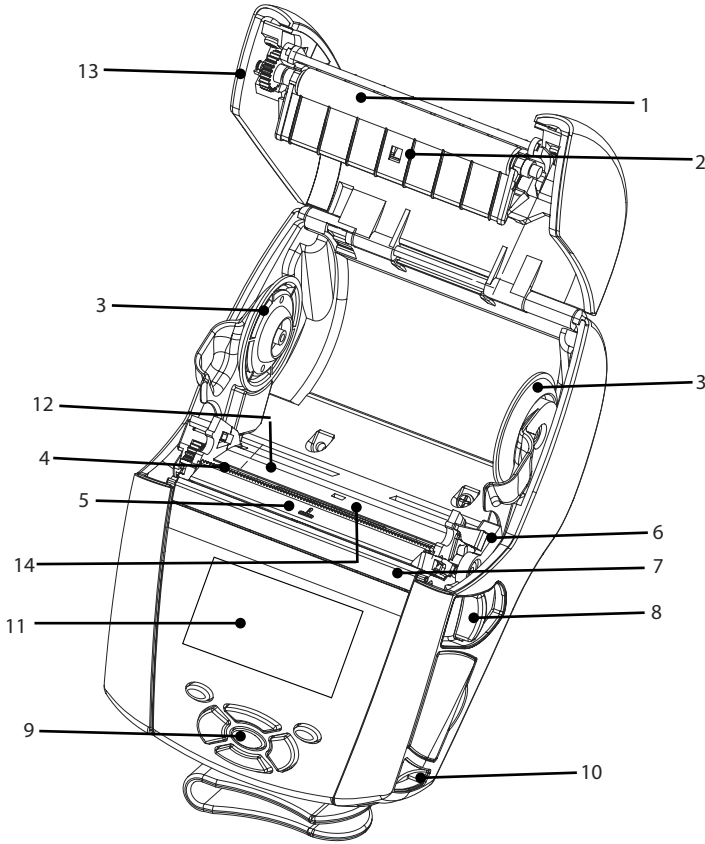


## Near Field Communication (NFC)

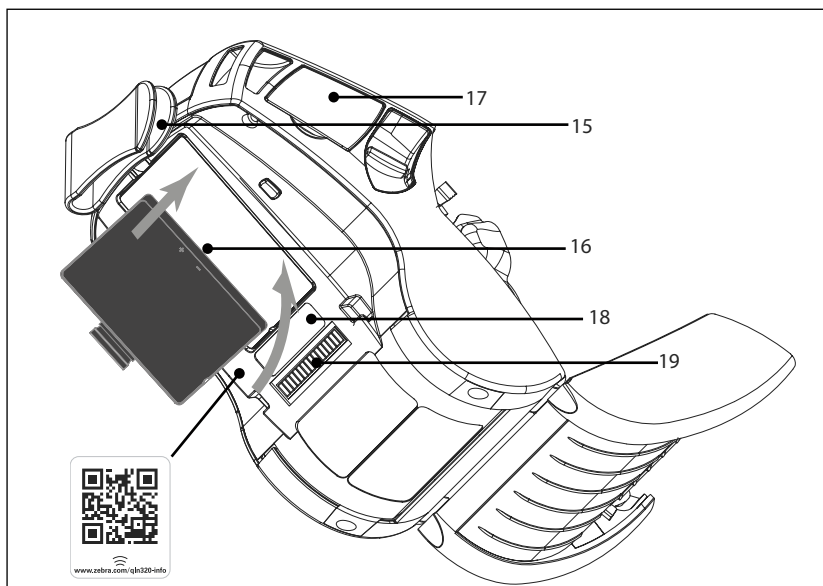
A **passive** NFC tag with the Bluetooth printer address will provide instant access to printer-specific information via an NFC-enabled smartphone.

# QLn Series Overview

Figure 1: QLn320 Shown



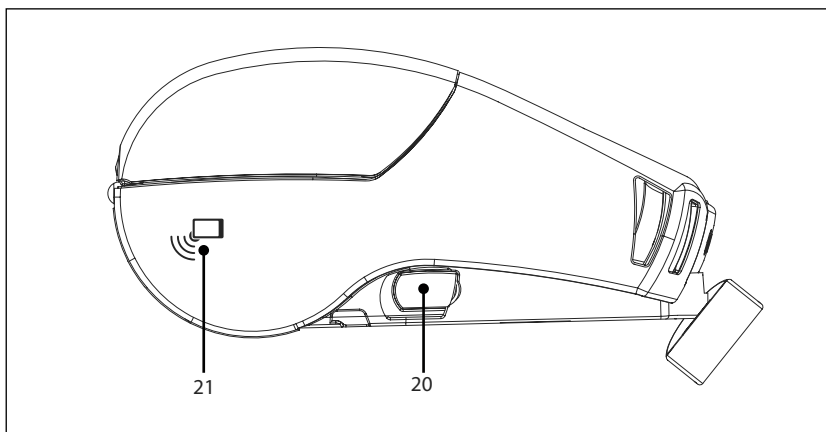
- |                          |                            |
|--------------------------|----------------------------|
| 1. Platen Roller         | 15. Belt Clip              |
| 2. Black Bar Sensor      | 16. Battery                |
| 3. Media Support Disks   | 17. USB/RS-232 Comm Ports  |
| 4. Tear Bar              | 18. MAC Address Label      |
| 5. Label Presence Sensor | 19. Docking Contacts       |
| 6. Peeler Lever          | 20. DC Input               |
| 7. Peeler Bail           | 21. NFC (Print Touch Icon) |
| 8. Latch Release Lever   |                            |
| 9. Key Pad               |                            |
| 10. Strap Post           |                            |
| 11. Status Screen        |                            |
| 12. Printhead            |                            |
| 13. Media Cover          |                            |
| 14. Gap Sensor           |                            |



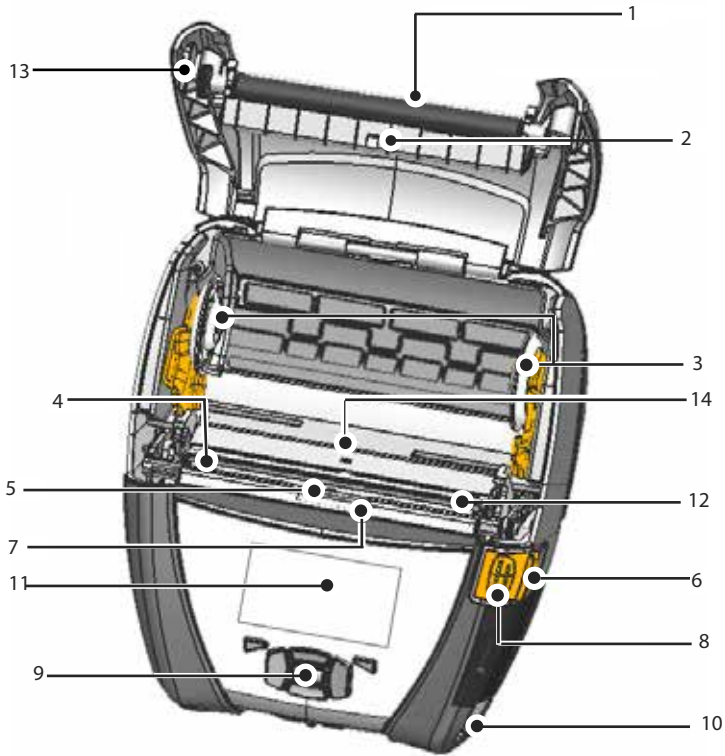
**Note:** Scanning the QR code with a smartphone will provide printer-specific information at [www.zebra.com/qln220-info](http://www.zebra.com/qln220-info) and [www.zebra.com/qln320-info](http://www.zebra.com/qln320-info).



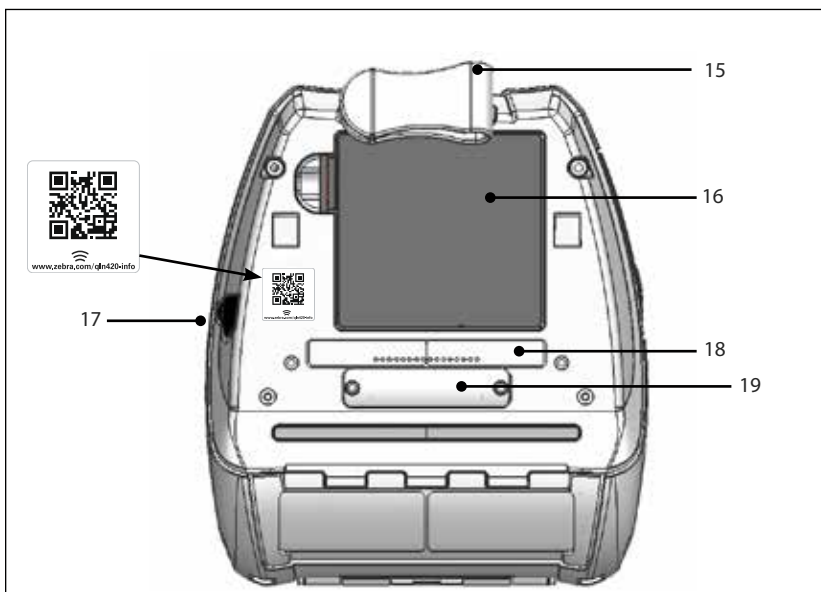
**Note:** Tapping the Zebra Print Touch™ icon with a Near Field Communication (NFC) enabled smartphone will provide instant access to printer-specific information. For more information about NFC and Zebra products, go to <http://www.zebra.com/nfc>. Bluetooth pairing applications via NFC is also possible. Please see Zebra Multi-platform SDK for more information.



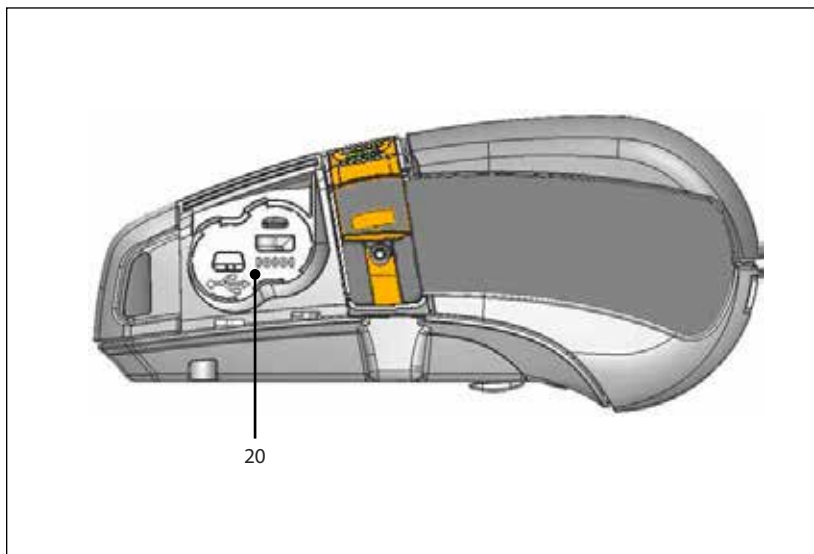
**Figure 2: QLn420 Shown**



- |                          |                           |
|--------------------------|---------------------------|
| 1. Platen Roller         | 15. Belt Clip             |
| 2. Black Bar Sensor      | 16. Battery               |
| 3. Media Support Disks   | 17. DC Input              |
| 4. Tear Bar              | 18. MAC Address Label     |
| 5. Label Presence Sensor | 19. Docking Contacts      |
| 6. Peeler Lever          | 20. USB/RS-232 Comm Ports |
| 7. Peeler Bail           |                           |
| 8. Latch Release Lever   |                           |
| 9. Key Pad               |                           |
| 10. Strap Post           |                           |
| 11. Status Screen        |                           |
| 12. Printhead            |                           |
| 13. Media Cover          |                           |
| 14. Gap Sensor           |                           |



**Note:** Scanning the QR code with a smartphone will provide printer-specific information at [www.zebra.com/qln420-info](http://www.zebra.com/qln420-info).



# Getting Ready to Print

## Battery

### Installing the Battery

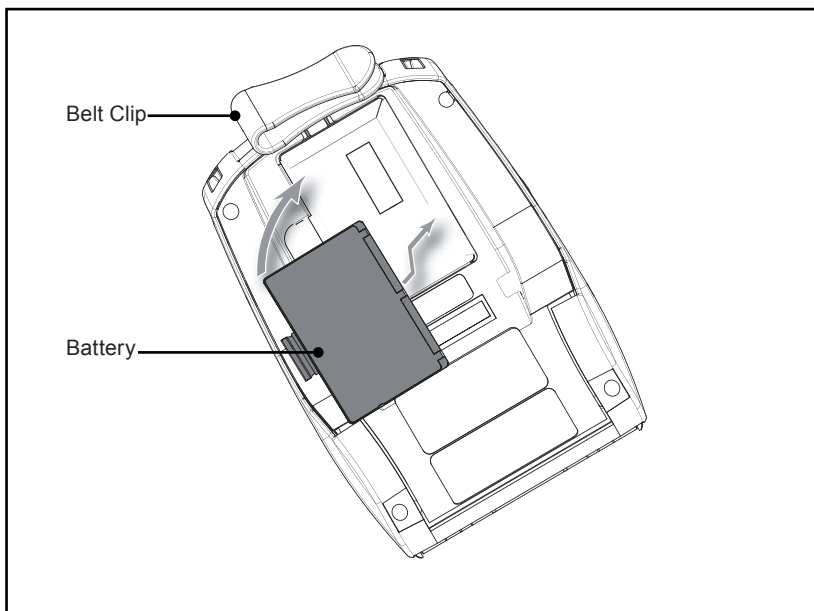


**Important • Batteries are shipped in sleep mode to preserve their maximum capacity while in storage prior to initial use. Plug in the AC adapter (see Pg. 19) or insert the battery into the Smart Charger 2 or Quad Charger (see Pg. 17) to wake it up before using for the first time.**

1. Locate the battery compartment on the bottom of the printer.
2. Swivel the belt clip (if present) to access battery compartment.
3. Insert the battery into the printer as shown in Figure 1. (It is not possible to insert the pack in an incorrect orientation.)
4. Rock the battery into the compartment as shown until it locks in place.

When the battery is first installed, the control panel indicators may briefly turn on and then go off which indicates the battery is not fully charged.

**Figure 3: Installing the Battery (QLn220 Shown)**



## Battery Safety

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**Caution • Avoid accidental short circuiting of any battery. Allowing battery terminals to contact conductive material will create a short circuit which could cause burns and other injuries or could start a fire.**

---



**Important • Always refer to the Important Safety Information data sheet shipped with each printer and the Technical Bulletin shipped with each battery pack. These documents detail procedures to ensure maximum reliability and safety while using this printer.**

---



**Important • Always dispose of used batteries properly. Refer to Appendix E for more battery recycling information.**

---



**Caution • Use of any charger not approved specifically by Zebra for use with its batteries could cause damage to the battery pack or the printer and will void the warranty.**

---



**Caution • Do not incinerate, disassemble, short circuit, or expose to temperatures higher than 65°C (149°F).**

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## Charger Safety

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**Do not place any charger in locations where liquids or metallic objects may be dropped into the charging bays.**

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# Smart Charger-2 (SC2) Single Battery Charger (P1031365-063)

The Smart Charger-2 (SC2) is a charging system for use with the 2-cell and 4-cell lithium-ion smart batteries used in the QLn Series printers.

## Charging Status Indicators

The SC2 uses a LED indicator to indicate the charge state in either Green, Yellow, or Amber as detailed below.

DC Power Input	Indicator	Battery Status
Present	Green	Battery not present
Present	Green	Fully charged
Present	Yellow	Charging
Present	Amber	Fault
Present	Off	Present and Battery Health = POOR

There will also be a battery charging graphic to indicate that this LED is the charging status indicator  .

## Battery Health Indicator

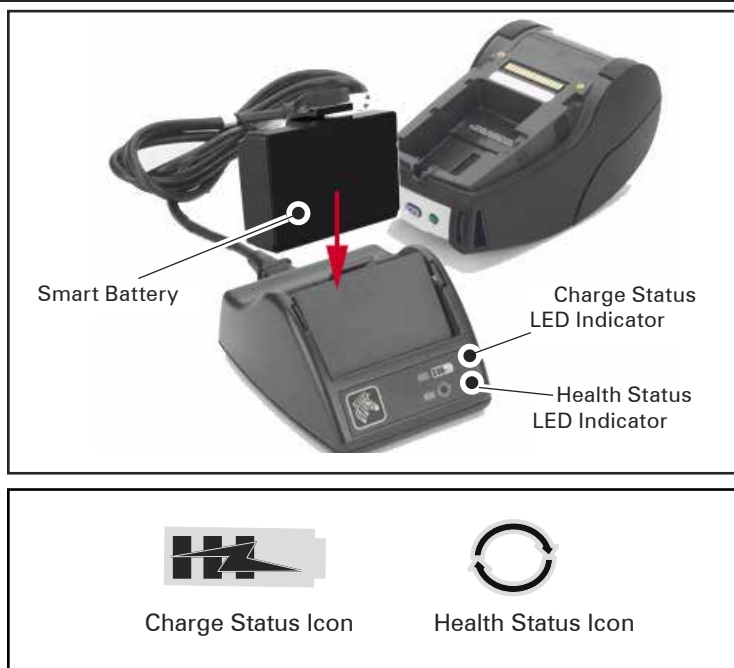
The SC2 features a tri-color (Yellow/Green/Amber) LED to indicate the health of the battery pack. An evaluation of the battery health begins upon insertion of the battery in the charger and results in the appropriate LED being illuminated as shown below. The LED will remain illuminated as long as input power is applied.

Battery	Indicator	Health Status
None or non-smart	Off	
Smart battery present	Green	GOOD
Smart battery present	Yellow	CAPACITY DIMINISHED
Smart battery present	Flashing yellow	PAST USEFUL LIFE
Smart battery present	Amber	UNUSABLE-REPLACE (discard per Instructions in Appendix E



**Note • For detailed information on the SC2, refer to the Smart Charger 2 User Guide (p/n P1040985-001).**

**Figure 2: Smart Charger-2 (SC2)**



### SC2 Dimensions

Height	Width	Length
65.1 mm (2.56 in.)	101.5 mm (4 in.)	120.9 mm (4.75 in.)

## Model UCLI72-4 Quad Charger (AC18177-5)

The UCLI72-4 Quad Charger is designed to charge up to four (4) QLn Series battery packs simultaneously. Batteries must be removed from the printer to be charged in the Quad Charger.

1. Ensure that the charger has been installed properly per the Quad Charger instruction manual. Ensure that the power indicator on the front panel is on.
2. Plug a battery pack into any one of the four charging bays as shown in Figure 3, noting the orientation of the battery pack. Slide the battery pack into the charging bay until it stops and then rock the battery pack back until it snaps into place. The amber indicator directly under the battery being charged will turn on if the battery is properly inserted.

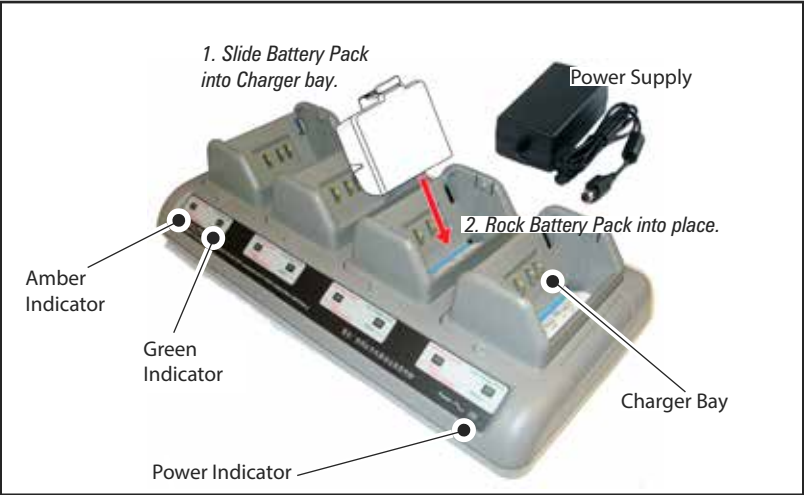
The indicators under the battery will allow you to monitor the charging process per the table below:

Amber	Green	Battery Status
On	Off	Charging
On	Flashing	80% charged (O.K. to use)
Off	On	Completely Charged
Flashing	Off	Fault-Replace Battery



**Important • A fault condition is caused by a problem with the battery. The charger may indicate a fault because the battery is too hot or cold to charge reliably. Try to charge the battery again when it returns to the room's ambient temperature. If the amber indicator starts flashing on the second attempt, the battery should be discarded. Always dispose of batteries in a proper manner as described in Appendix F.**

Figure 3: Quad Charger



Quad Charger Cycle Times :

Battery Status	Standard Pack	Extended Pack
Battery 80% Charged	<2 Hrs.	<4 Hrs.
Battery Fully Charged	< 3 Hrs.	<5 Hrs.



**Note • These times are for completely discharged batteries.**

Battery packs which are only partially discharged will take less time to reach their charged state. Batteries which have reached 80% of their charge capacity may be used, however, it is recommended that you allow the batteries to reach a full charge to maintain maximum battery life.



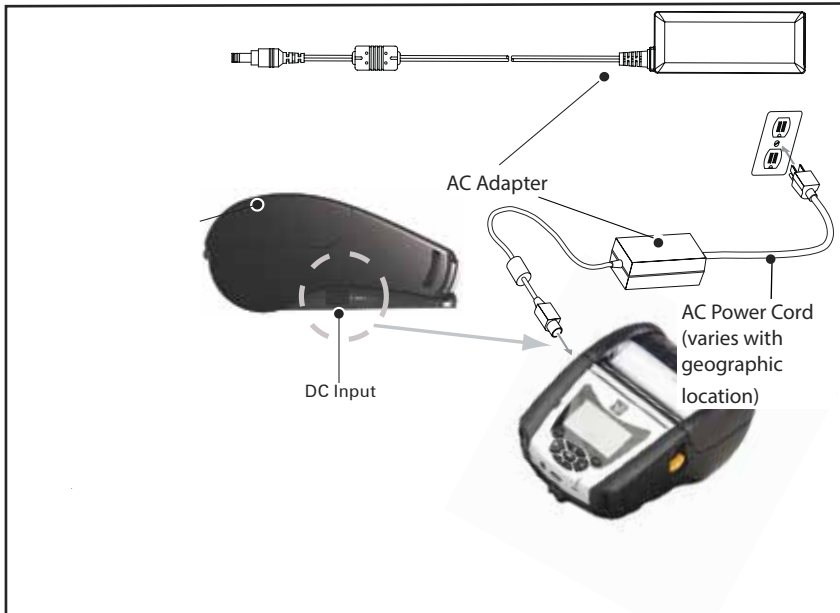
***The UCLI72-4 Quad Charger has a safety feature which stops charging a battery after six hours regardless of its charge state. If not fully charged, it might be indicative of a battery that needs to be replaced.***



***Use care when installing the UCLI72-4 Quad Charger so that you do not block the ventilating slots on the top and bottom covers. Ensure that the charger is plugged into a power source which will not accidentally be turned off if you will be charging batteries overnight.***

## AC Power Adapter (p/n P1031365-024)

**Figure 4: Charging the Battery Pack with the AC Power Adapter**



- Open the protective cover on the printer to expose the DC input charger jack.
- Connect the appropriate AC power cord for your location to the adapter and then plug the power cord into an AC receptacle.
- Plug the barrel plug from the AC adapter into the charger jack on the printer.
- The printer will power up and begin charging. The printer can be left on or turned off at this point. Charging will continue in either state.



---

**Note • Batteries are shipped in sleep mode to preserve their maximum capacity while in storage prior to initial use. Plug in the AC adapter (see Pg. 19) or insert the battery into the Smart Charger 2 or Quad Charger (see Pg. 17) to wake it up before using for the first time.**

---



---

**While it's possible to charge the battery when using the printer, charge times will increase under this condition.**

---

## Ethernet and Charging Cradles

The cradle is an expansion base intended for use with the QLn Series printers. There is a four bay cradle (QLn-EC4) or a single bay option (QLn-EC) for use with the QLn220 and 320, as shown on pages 23 and 24. There is also a single bay Ethernet and charging option for the QLn420 (QLn420-EC) as shown on page 24.

The QLn-EC/EC4 cradles provide charging power to the docked printer as well as providing a standard 10/100Mb/S Ethernet port for communication to the printer. The QLn420-EC also provides charging power to the docked printer, as well as a standard 10/100Mb/T Ethernet port for communication to the printer. All cradles also supply battery charging power to the docked printer and acts as a supplementary power source for a functioning QLn printer.

All QLn Ethernet cradles feature two LED's to indicate the status of the cradle: Solid green to indicate when power is provided to the input of the cradle; and blinking green to indicate Ethernet activity.

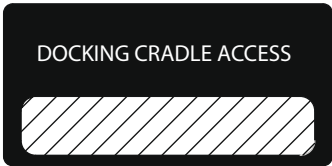
The cradle allows the user to dock the printer easily and remove it with the push of a button. The printer shall remain

operable while docked, i.e. display is viewable, charge LED status is viewable, and printer controls and data entry are available. The printer will still print while docked and the user shall be able to replace the media as well.

LED Status	Indication
Solid Green	Power On
Blinking Green	Ethernet Activity

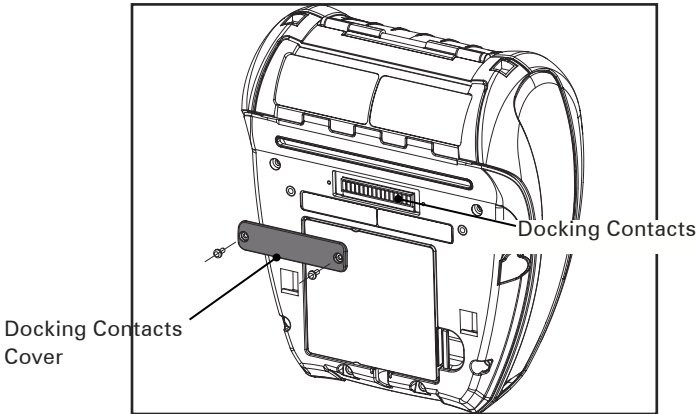


**Note • Remove the “Docking Cradle Access” label on the bottom of the QLn320 or QLn220 printers before docking the printer in the cradle.**

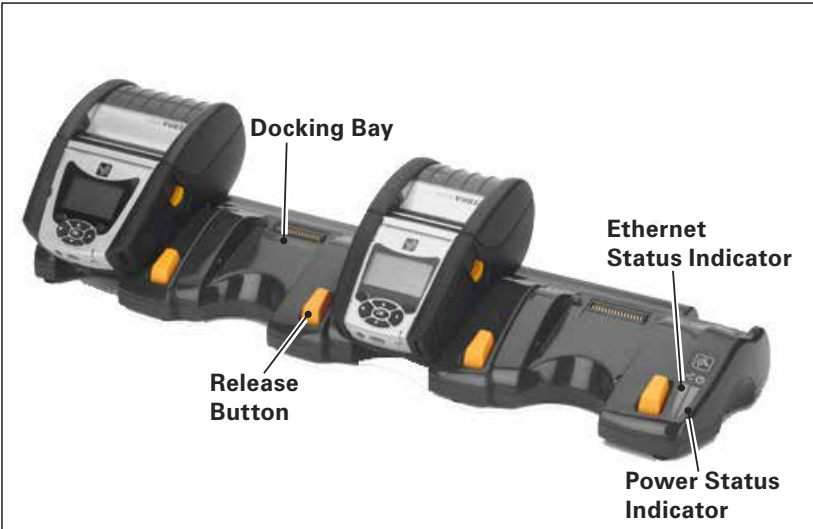


**Note • Clean the docking contacts with a Zebra cleaning pen to remove any residue left behind by the label.**

The QLn420 does not use the above label over the docking contacts, but instead includes a plastic docking contacts cover secured by two screws. Remove the screws to remove the docking contacts cover from the printer and expose the docking contacts (as shown below).



**Figure 5: Ethernet Cradle (4-Bay for QLn220/320)**



Height	Width	Length
66,7 mm (2.62 in.)	579,9 mm (22.83 in.)	150,57 mm (5.93 in.)



**Note • The QLn220 and 320 extended battery capacity is not compatible with the QLn-EC and EC4 cradles.**

**Figure 6: Ethernet Cradle Single Bay (QLn220/320)**



Cradle	Height	Width	Length
QLn-EC	66,7 mm (2.62 in.)	171,28 mm (6.74 in.)	150,57 mm (5.93 in.)
QLN420-EC	66,2 mm (2.60 in.)	137,7 mm (5.42 in.)	219,6 mm (8.64 in.)

**Figure 7: Ethernet Cradle (QLN420)**



## Printer Operation with Cradle

- All QLn Series printers will charge when placed in their supported cradles.
- Only QLn Series printers that have the Ethernet option installed will connect to an Ethernet network. Check the PCC code on the back of the printer (see Appendix D for location). Codes of the form QNx-xxxxxx0xx-xx do not support Ethernet, and codes of the form QNxxxxxxExx-xx or QNx-xxxxxMxx-xx do support Ethernet (where “x” means don’t care). You can also check the “Communications” sub-menu on the LCD (see Main Menu Screen on page 38). After selecting this sub-menu, any communication options not installed will be so indicated.
- When power is applied to the cradle and the printer is docked, the printer charge LED indicates the charge status of the printer (see Figure 18).
- Docking the printer in the cradle will automatically turn the printer on to ensure it is available to be managed remotely.
- When the printer detects input power from the cradle, and the presence of a live Ethernet link, it will automatically reboot and connect to the Ethernet network.
- For printers with an 802.11 radio, this interface will be turned off when the Ethernet link is active. It will turn back on if the Ethernet link is no longer active.
- For printers with a Bluetooth radio, this interface will remain active while the printer is in the cradle.
- The serial and USB ports will remain active while the printer is in the cradle.
- The DC input barrel jack connector (see Figure 7) cannot be used while the printer is in the cradle. The DC barrel jack should be plugged directly into the cradle instead.



**Note • The printer provide over voltage protection such that no damage occurs when voltages from 0-36V are applied at the DC Power jack. Upon application of voltage greater than 36V, the DC line fuse will permanently open to reduce fire hazard. The battery is only charged when 12VDC is applied using the Zebra AC adapter.**

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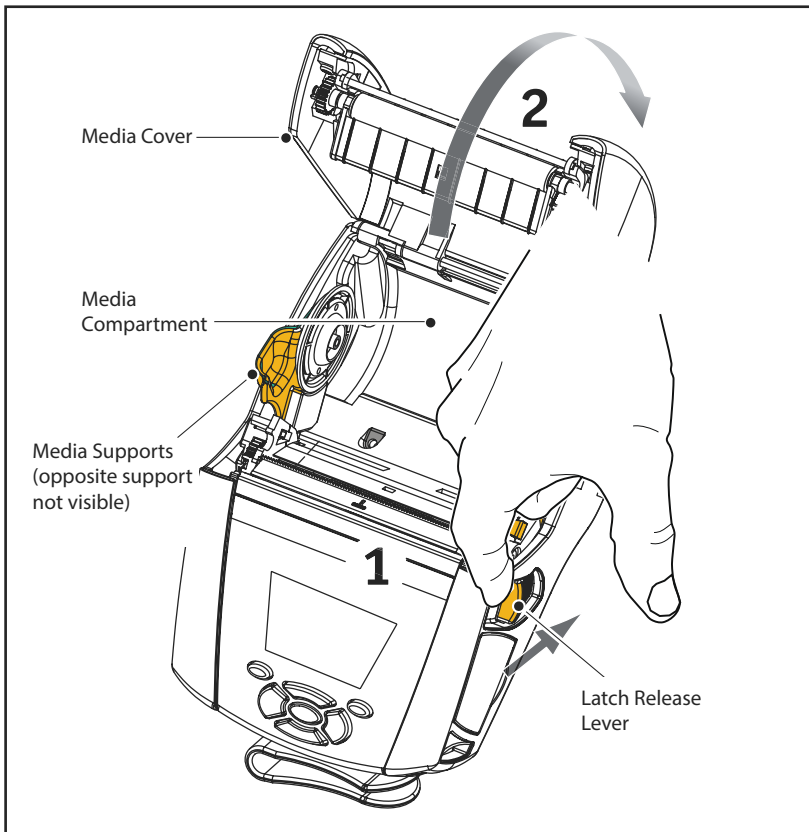
## Loading the Media in the QLn Series Printers

You can operate QLn Series printers in one of two different modes: Tear-Off or Peel-Off. Tear-Off mode allows you to tear off each label (or a strip of labels) after it is printed. In Peel-Off mode, the backing material is peeled away from the label as it is printed. After you remove this label, the next one is printed.

### Loading Media Procedure

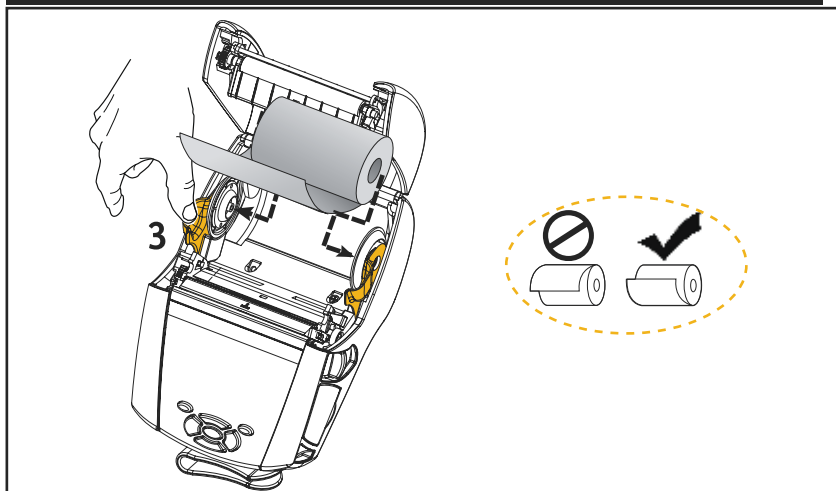
1. Open the printer (Refer to Figure 7).
  - Press the Media Cover Button on the side of the printer as shown in "1" below. The Media Cover will open automatically.
  - Rotate the Media Cover back completely as shown in "2", exposing the media compartment and adjustable media supports.

**Figure 8: Opening the Printer**

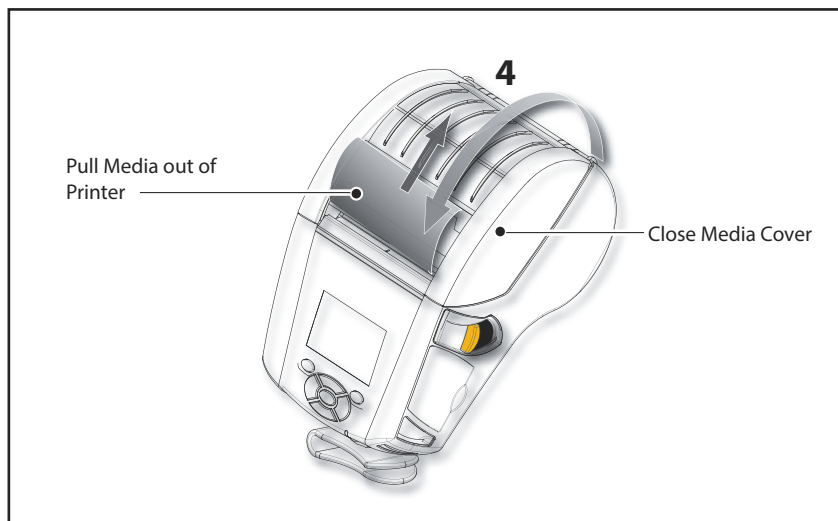


2. Pull the media supports apart as shown in Figure below. Insert the roll of media (in the orientation shown) between the supports and let the supports secure the media in place. The supports will adjust themselves to the width of the media, and the media roll should be able to spin freely on the supports.

**Figure 9: Loading Media**



3. If you plan to use the printer in tear-off mode, close the media covers shown below.

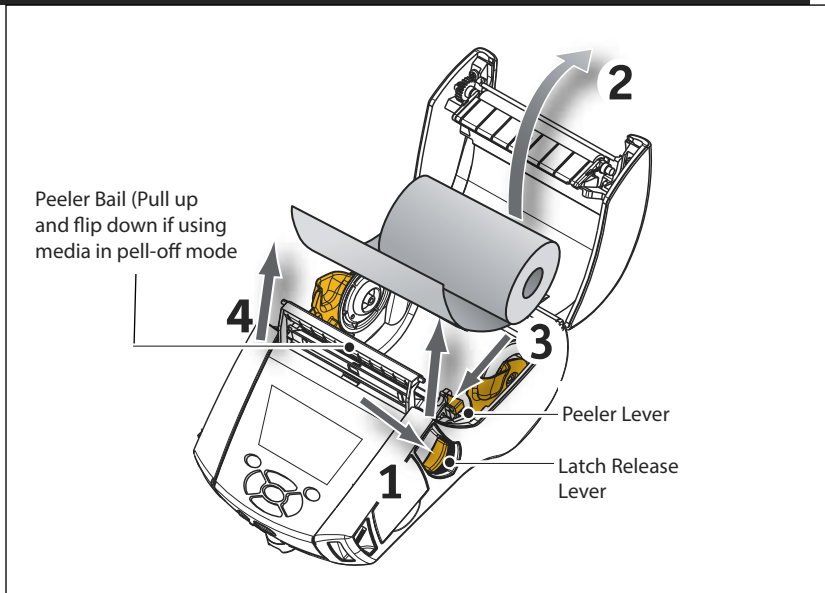


**Note • Please refer to the Programming Guide (P1012728-xxx) for information on changing the setting to adjust the media feed length via a Set-Get-Do (SGD).**

## Loading Media in Peel-off Mode (QLn220/320)

- If you plan to use the printer in the peel-off mode, peel a few labels off of the media and load the media as previously described.
- Push the peeler lever forward to release the peeler bail into the “up” position as shown at “3” and “4” in Figure 10.
- Close the media cover to lock the peeler bail in place. The media will feed between the peeler bail and platen.

**Figure 10: Activating Peeler Bar (QLn320 Shown)**



- Turn on the printer or press the Feed button on the front of the printer if the printer is already on. The printer will advance the media to the next label, if printing labels. If you are printing on journal media, the printer will advance a short strip of media.

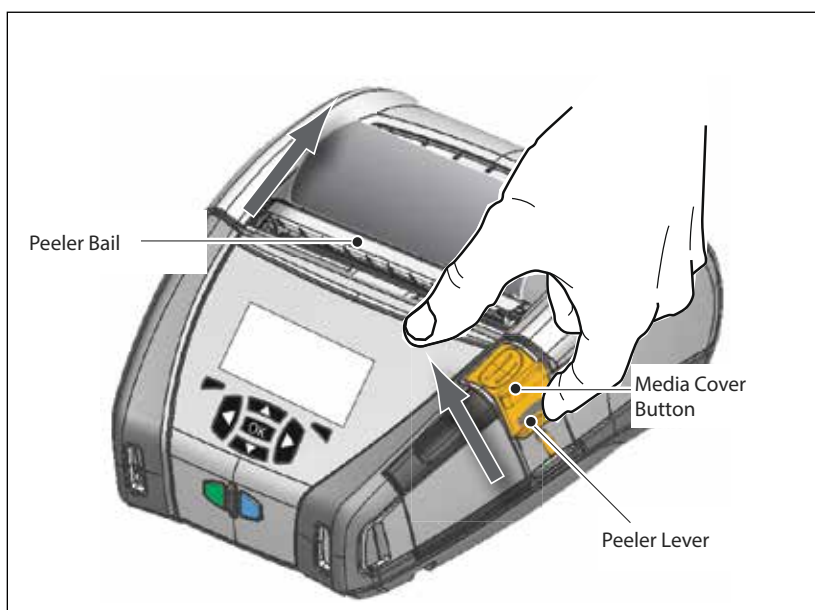
To disengage the peeler bail, first open the media cover as previously described. The peeler bail will automatically return to the Up position.

Press straight down on the peeler bail to lock it in place in its original home position.

## Loading Media in Peel-off Mode (QLn420)

- If you plan to use the printer in the peel-off mode, peel a few labels off of the media and load the media as previously described.
- Close the media cover.
- Lift up on the peeler lever located on the side of the printer below the media cover button.
- Lock the peeler lever in the “up” position to fully engage the peeler bail.

**Figure 11: Activating Peeler Bar (QLn420 Shown)**



- Turn on the printer or press the Feed button on the front of the printer if the printer is already on. The printer will advance the media to the next label, if printing labels. If you are printing on journal media, the printer will advance a short strip of media.



**Note • Peeler will not work with most synthetic label stock since that media is softer and tends to adhere to its liner. However, the QLn420 printer is fully capable of printing on synthetic labels.**

- To disengage the peeler bail, press the peeler release while pressing straight down on the peeler lever. This will disengage the peeler bail and return it to its original home position.



**Note • Before disengaging the peeler, be sure there are no peeled labels present on the peeler bail. This could cause a label jam if you were to disengage with the peeled label present.**

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## QLn Healthcare Printers

Zebra QLn Healthcare 2" and 3" printers are designed to meet the specific and unique needs of the healthcare environment. The healthcare application is based on the QLn220 and QLn320 printers primarily for barcode label printing, but also retaining the QLn's ability to print receipts.

The QLn220 and 320 Healthcare printers also offer a few key enhancements to these existing printers:

- Provide printers with distinctive gray and white healthcare colors (see Page 32) and performance plastics that can also be disinfected with the most common cleaners used in hospitals.
- Leverage the technology advancements made on the QLn platform, i.e. new User Interface, NFC, QR code.
- Add the MFi chip to the QLn main logic board to support Bluetooth connectivity between the printer and an iOS device as Apple devices are expected to grow in popularity in this segment.



**Figure 12: QLn Healthcare Printers**



Since the QLn220 and 320 Healthcare are based on the QLn220 and 320 platform, they are designed to be direct thermal printers which support variable print widths. They will provide a print experience compatible to the QLn220 and 320, specifically in the following areas:

- They will support the same barcodes, barcode quality, and visual print quality.
- They will offer equal wireless performance in terms of range, reliability, and speed.
- They will be compatible with all QLn220 and 320 accessories.

Due to the nature of the healthcare environment, QLn Healthcare printers feature more rugged plastics designed and tested to withstand constant cleaning with all major hospital cleaners for the life of the printer.



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**Note • Refer to the Guide to Disinfecting and Cleaning QLn Healthcare Printers (P1066640-001) for detailed cleaning instructions.**

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**Note • Refer to the QLn Healthcare Printers Quick Start Guide (P1067208-001) for more detailed information on these printers.**

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## Operator Controls

The QLn Series printers come equipped with a keypad control panel and LCD graphical user interface. The standard control panel is illustrated in Figure 13, 13a, and 14. The LCD interface allows easy display and selection of many printer functions as detailed on following pages.

### Standard Control Panel

The standard control panel has multiple control buttons and two multipurpose indicators.

- The Power Button turns the printer on and off.



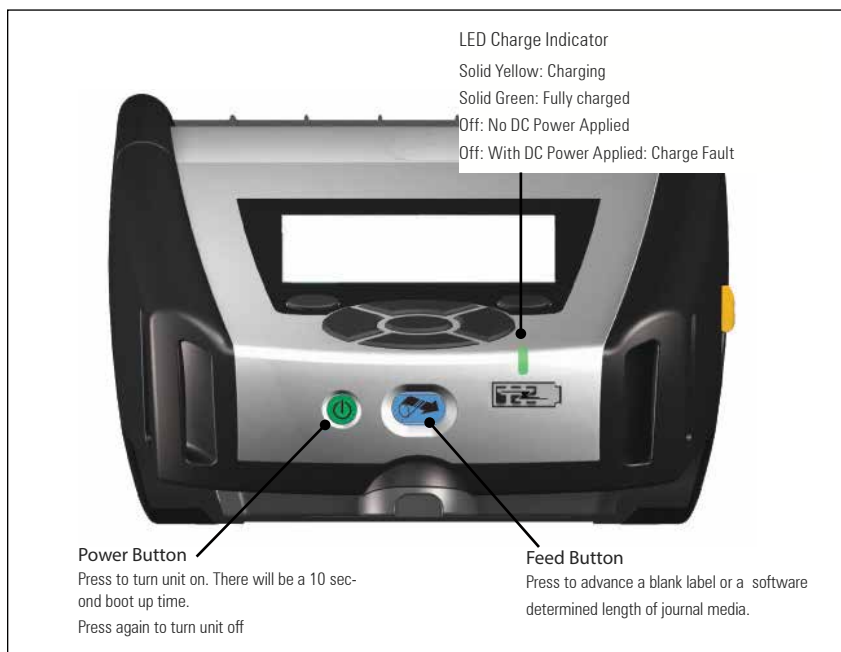
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**Note • When turning on the QLn420 printer, press and hold the Power Button between 1.5 and 2.5 seconds. When the LCD illuminates, release the Power Button. To turn off the printer, press and hold the Power Button until the printer shuts down.**

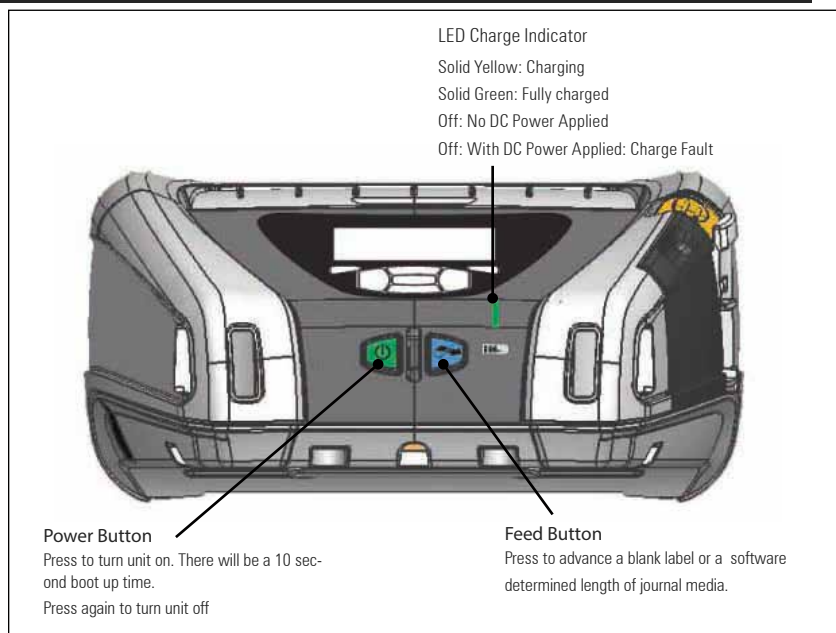
---

- The Media Feed Button advances a length of media which is determined by the type of media being used. Label media will be advanced to the next gap or bar sense marker. Journal (plain) media will be advanced by a length determined by the printer's software.
- The LED Charge Indicator shows solid Yellow when charging, solid Green when fully charged, and is turned off when there's a fault condition and the printer is plugged in.
- Four Way Navigation Buttons allow the user to scroll between functions on the LCD user space. (The Navigation Buttons do not apply to the Status Bar and Navigation Bar.)
- Enter Button allows the user to select the desired function highlighted on the LCD interface and is indicated by the word "OK".
- Two software defined function keys allow the user to select a function listed on the navigation bar.

**Figure 13: Standard Control Panel (QLn320/220)**



**Figure 13a: Standard Control Panel (QLn420)**

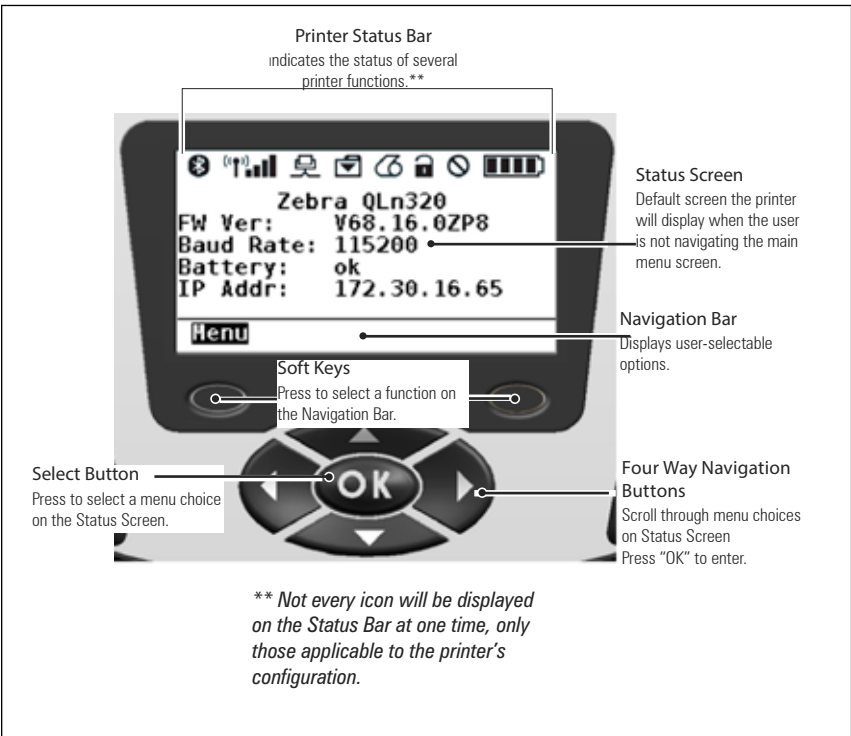


### LCD Control Panel

The 240x128 pixel LCD control panel allows the user to view the status of the QLn Series printer and have access to various printer alerts and messages. It also has multi-directional keys which allow navigation and selection of menu options affecting printer functions. These keys allow scrolling through the various options and settings. The “OK” button allows selection of the option or function displayed on the screen.

The top of the screen has a row of status icons, or a Status Bar, which indicate the state of various printer functions. The Status Bar is located above the Status Screen shown below along with a Navigation Bar. The Status Screen is the default display and is shown at power up. When navigating the menus, the printer will automatically return to this screen when the user is done navigating after an appropriate delay.

**Figure 14: LCD Control Panel (QLn320/220)**




## Status Bar Icons



Indicates Bluetooth® connection status. The icon will blink to show that the printer is receiving label data via Bluetooth, and is solid when link is established. This icon appears only on printers with the Bluetooth wireless option installed.



Indicates that the printer is connected to a radio network via 802.11 protocols. The antenna icon will blink with no parentheses when looking for an access point. One set of solid parentheses with blinking antenna indicates WLAN is associated and attempting authentication. Two sets of solid parentheses and solid antenna indicate the printer is successfully connected to the WLAN. The icon and two parentheses will blink to show the printer is receiving printer data via WLAN. The four (4) bars  indicate the strength of the WLAN connection to the access point. These icons appear only with the 802.11 radio installed.



The Ethernet icon will blink when the printer is receiving label data via the Ethernet connection. It will not be displayed on the status bar when the Ethernet is inactive. This icon appears only when the Ethernet option is installed and the printer is docked in Ethernet cradle.




The Data icon indicates data being sent to the printer, i.e. the icon will blink when there is a label data transmission via the serial or USB ports.





The Media Out icon will blink when there is no media in the printer and will not blink when there is media in the printer.



The Head Latch icon indicates if the media cover is closed or not properly latched. It will appear unlocked and blinking if open and will not appear if the cover is closed.

 The Error icon will be displayed and blink if an error condition exists. The icon will not be displayed if no printer error exists. Since there are separate icons for Media Out and Head Latch Open, these two alerts do not apply to the Error icon.

 The Battery Charge Level icon indicates the reported state of charge from the battery pack. In a non-charging state, four (4) bars indicates the battery level is greater than 80%. Three (3) bars indicates if the battery level is less than or equal to 80% but greater than 60%. Two (2) bars indicates if the level is less than or equal to 60% but greater than 40%. One (1) bar indicates if the battery level is less than or equal to 40% but greater than 20%. And zero (0) bars indicates if the level is less than or equal to 20%.

While the battery is charging, a lightning bolt will appear in the battery icon  to indicate that charging is taking place. When the battery is charging and fully charged, four bars will be displayed. When the battery is charging and the level is greater than 80%, the battery icon will alternate between four bars and three bars. When the battery is charging and the level is less than or equal to 80% but greater than 60%, the icon will alternate between three bars and two bars. When the battery is charging and the level is less than or equal to 60% but greater than 40%, the icon will alternate between two bars and one bar. When the battery is charging and the level is less than or equal to 40% the icon will alternate between one bar and zero bars.

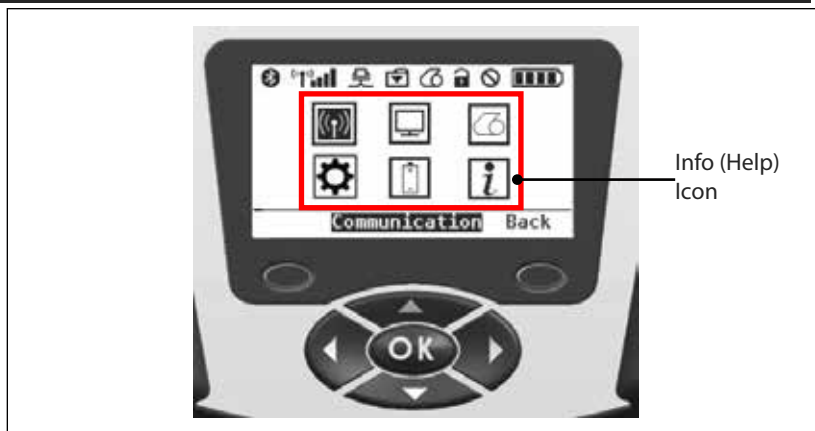
## Main Menu Screen (QLn320/220)

The user can select options on the Main Menu screen by pressing the soft key located beneath the Menu option on the navigation bar. The Main Menu screen displays graphical options including Communication, Display, Media, Settings, Battery, and Help.



**Note • The QLn Healthcare printers feature a different menu system. See Page 40 for details.**

**Figure 15: Main Menu Screen (QLn320/220)**



The user can scroll between icons using the four-way arrow buttons. When an icon is highlighted, its text description will be displayed in the middle of the navigation bar, and can be selected by pressing the “OK” button. This will take the user to the screen with status information specific to that option. The Info (or Help) menu provides useful information on a variety of topics. Please explore this menu to become more familiar with your printer and how it operates.

The QLn Series printers will also display various alerts, such as “Media Out”, “Media Cover Open”, or “Battery Low”. The user can respond to questions by pressing one of the soft keys to indicate that an action has been taken to address the alert in question. Once the condition causing the alert has been addressed (i.e. loading media), the alert message will be cleared. (See Appendix H for a complete list of alerts for the QLn Series printers.)



### Programmable LCD Settings

In addition to the status icons, the LCD control panel can display other printer settings and functions as text. Applications can be written to allow the user to view and /or modify these settings using the scroll and select keys on the display. The menu that comes with the printer provides access to the most commonly used parameters. Refer to the Programming Guide (p/n P1012728-008) for a complete list of the parameters, and for details on how to change the front panel display at [www.zebra.com/manuals](http://www.zebra.com/manuals)).

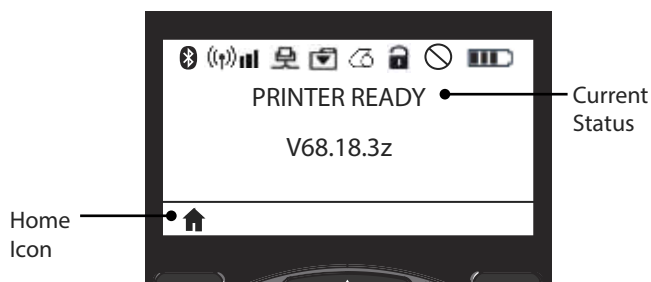
The LCD backlighting option allows viewing of the screen in a dark environment, or provides better contrast in a very bright environment. The QLn320 and QLn220 can be programmed to enter a low power mode (Backlight Off) during periods of front panel inactivity. While in low power mode, the screen is populated with menus and status icons, data which may or may not be readable depending on ambient light conditions. The QLn Series printers provide a configurable time delay from the time the backlight is turned on to when it turns off. The time range for this delay is 5 to 1200 seconds with a default time of 10 seconds. The backlight can be activated within one second after any of the cursor, select, or soft keys is pressed. (The feed button does not activate the backlight.) The status bar icons, the user space content, and the navigation bar will remain on the screen with the backlight off. Extensive use of the display backlight will decrease the time the printer can run between charges. Refer to the section “Extending Battery Life” for more information.

## Home Menu Screen (QLn420 and QLn Healthcare Printers)

The QLn420 and QLn Healthcare printers share the same control panel. The printer's control panel includes a display where the user can view the printer's status or change its operating parameters. After the printer completes the power-up sequence, it moves to the Idle Display screen (Figure 21). This screen includes the printer's current status, information such as firmware version and IP address, and a Home menu shortcut.

The Home Menu for the printer uses a different set of icons than the standard QLn320 and QLn220, uses larger fonts for enhanced readability, and also provides support for multiple languages. The Home Menu screen displays graphical parameter options including Settings, Tools, Network, Battery, Language, Sensors, Ports, and Bluetooth (as shown in Figure 22). These options allow the user to view the printer's status or change its operating parameters.

**Figure 16: Idle Display Screen (QLn420 and QLn Healthcare)**











The printer's operating parameters are sorted into eight (8) user menus, which you can access through the printer's Home menu (Figure 22). Click on the Home icon located on the Idle Display screen to proceed to the Home Menu.

The user can scroll between icons using the four-way arrow buttons. When an icon is highlighted, its text description will be displayed in the middle of the navigation bar, and can be selected by pressing the "OK" button. This will take the user to the screen with status information specific to that option.

**Figure 17: Home Display Screen (QLn420 and QLn Healthcare)**




Icon	Parameter
	See Settings menu in Appendix D
	See Toolss menu in Appendix D
	See Network menu in Appendix D
	See Battery menu in Appendix D
	See Language menu in Appendix D
	See Sensors menu in Appendix D
	See Ports menu in Appendix D
	See Bluetooth menu in Appendix D

Whereas the QLn320 and 220 printers have multiple line items per screen, the QLn420 and QLn Healthcare printers display one setting per screen using larger fonts (as shown below). In order to navigate to the next setting, click on the right arrow button. Click on the soft key below the Home icon to return to the Home Menu screen to choose a different parameter.

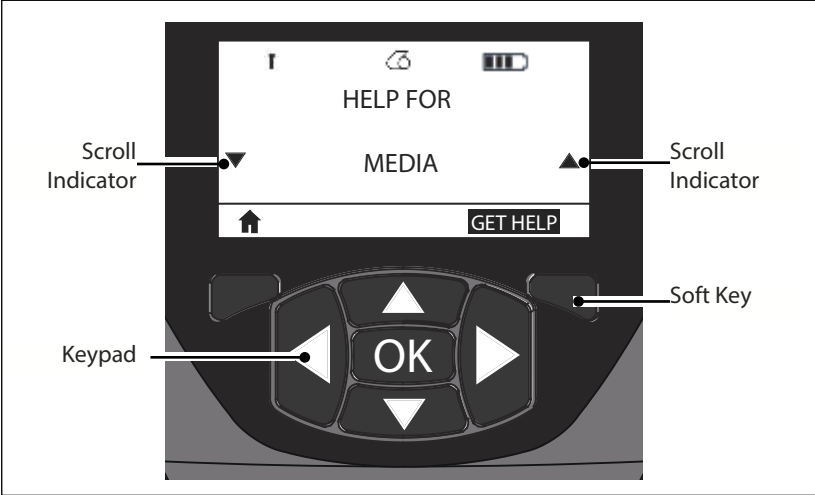
**Figure 18: Print Settings Example**



Some parameter settings have a scroll option to view multiple setting choices. This option is identifiable by the presence of up and down arrows located on either side of the display (Figure 24). For example, the Tools parameter  has a Help option for many printer functions such as media, battery icon, error icon, latch icon, media icon, receive data icon, ethernet icon, signal icon, WLAN icon, Bluetooth icon, power LED, printhead, and battery.

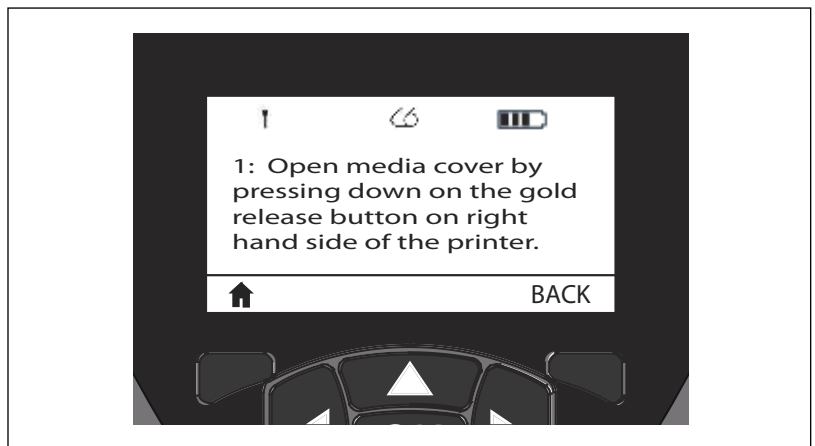
Press the up and down arrows on the keypad to scroll through a setting's various options. Press the left and right arrows to scroll to the next setting.

**Figure 19: Scroll Option (Help Settings)**



Press the soft key beneath the “GET HELP” command on the display in this example to receive basic help information for loading media in the printer (Figure 20).

**Figure 20: Scroll Details (Help For Media)**



Press the soft key beneath “BACK” to return to the previous screen.

## **Verify the Printer is Working**

Before you connect the printer to your computer or portable data terminal, make sure that the printer is in proper working order. You can do this by printing a configuration label using the “two key” method. If you can’t get this label to print, refer to “Troubleshooting”.

### **Printing a Configuration Label**

1. Turn the printer off. Load the media compartment with journal media (media with no black bars printed on the back)
2. Press and hold the Feed Button.
3. Press and release the Power button and keep the Feed button pressed. When printing starts, release the Feed button. The unit will print a line of interlocking “x” characters to ensure all elements of the print head are working, print out the version of software loaded in the printer and then print the report.

Note that the report can also be printed from the Info (Help) menu on the LCD.

The report indicates model, serial number, baud rate, and more detailed information on the printer’s configuration and parameter settings. (See the Troubleshooting Section for sample printouts and a further discussion on how to use the configuration label as a diagnostic tool.)

## Connecting the Printer

The printer must establish communications with a host terminal which sends the data to be printed. Communications occur in four basic ways:

- QLn Series printers can communicate by cable via either RS-232C or USB 2.0 protocols. USB drivers are included in the Zebra Designer Driver which can be downloaded from [www.zebra.com/drivers](http://www.zebra.com/drivers).
- By means of a wireless LAN (Local Area Network) per 802.11 specifications. (Optional)
- By means of the Ethernet when docked on the Ethernet cradle. (Optional)
- By means of a Bluetooth short range radio frequency link. (Optional)
- WinMobile®, Blackberry®, and Android® devices use standard Bluetooth protocol.
- QLn Series printers are compatible with iOS devices, therefore printing via Bluetooth to an Apple® device is possible.



## Cable Communication



**Caution • The printer should be turned off before connecting or disconnecting a communications cable.**

The QLn Series printers can communicate by cable; the specific cable supplied with your printer will vary with the host terminal and your model printer.

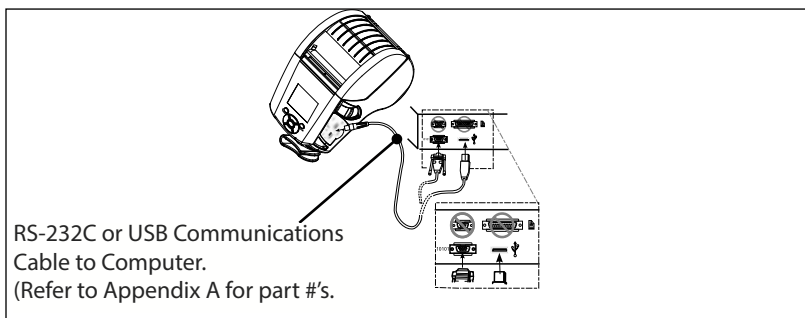
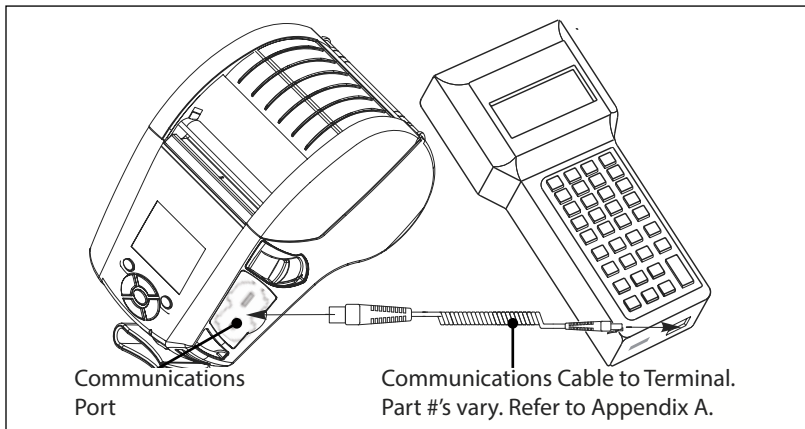
### RS-232C Communications

The 14-pin serial connector on your communications cable plugs into the serial communications port on the side of the printer. QLn Series printers also have a USB port.

### USB Communications

The small 5-pin connector on the USB cable plugs into the printer. The connectors are keyed to assure correct alignment; do not try to force the cable if it does not plug in.

**Figure 21: Communication Options (QLn320 Shown)**



The other end of the cable must be plugged into the host terminal as shown in Figure 21, or to a serial or USB port on a computer (Figure 21). The QLn Series is configured with the USB Open HCI interface driver allowing it to communicate with Windows® based devices.

USB drivers are included in the Zebra Designer Driver which can be downloaded from the Zebra Web site. Other terminals or communications devices may require the installation of special drivers to use the USB connection. Consult the factory for further details.

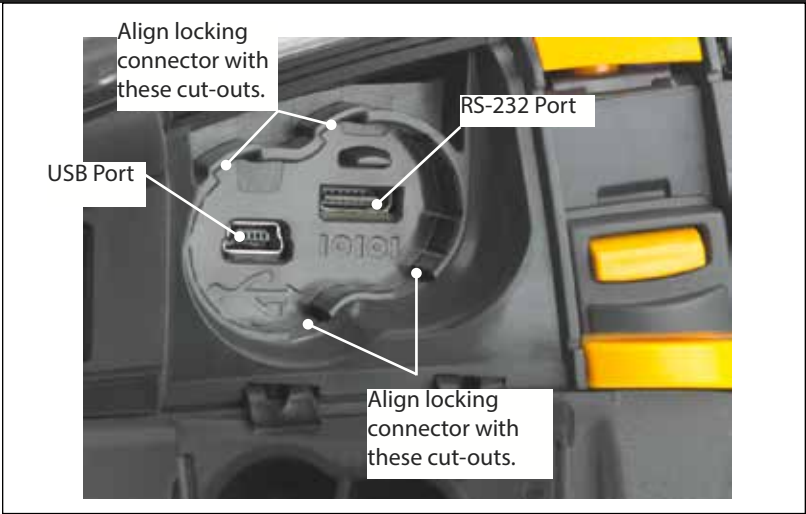
**Providing Strain Relief for Communications Cable**

If you are connecting either a USB or RS-232 communications cable to the printer permanently, access the communications port on the side of the printer next to the latch release lever. Plug the connector into the appropriate port and align the plastic locking cap with the cut outs shown below. Rotate the locking cap clockwise to lock the cable in place. (Turn counter clockwise to unlock the cable.) Once locked in place, this provides strain relief for the cable and will prevent the cable from disconnecting from the printer.



**Note • Only one cabel can be present in the USB/RS-232 communications port at a time for strain relief purposes.**

**Figure 22: Communications Port (QLn420 Shown)**



**Figure 23: Communications Port Strain Relief (QLn420 Shown)**



## Wireless Communications with Bluetooth

Bluetooth is a worldwide standard for the exchange of data between two devices via radio frequencies. This form of point-to-point communication does not require access points or other infrastructure. Bluetooth radios are relatively low powered to help prevent interference with other devices running at similar radio frequencies. This limits the range of a Bluetooth device to about 10 meters (32 feet). Both the printer and the device it communicates with must follow the Bluetooth standard. Other than conditions specified elsewhere in this manual, only one of the radio options can be installed in the printer at one time and the antenna used for these transmitters must not be co-located or must not operate in conjunction with any other antenna.

## Bluetooth Networking Overview

Each Bluetooth enabled QLn Series printer is identified by a unique Bluetooth Device Address (BDADDR). This address resembles a MAC address whereby the first three bytes are vendor, and the last three bytes are device (e.g. 00:22:58:3C:B8:CB). This address is labeled on the back of the printer via a barcode for ease of pairing. (See Page 34.) In order to exchange data, two Bluetooth enabled devices must establish a connection.

Bluetooth software is always running in the background, ready to respond to connection requests. One device (known as the master or the client) must request/initiate a connection with another. The second device (the slave or the server) then accepts or rejects the connection. A Bluetooth enabled QLn Series printer will normally act as a slave creating a miniature network with the terminal sometimes referred to as a "piconet".

Discovery identifies Bluetooth devices that are available for pairing whereby the master device broadcasts a discovery request and devices respond. If a device is not discoverable, the master cannot pair unless it knows the BDADDR or has previously paired with the device.

Bluetooth 2.1 or higher uses Security Level 4 Secure Simple Pairing (SSP), a mandatory security architecture that features four (4) association models: Numeric Comparison, Passkey Entry, Just Works (no user confirmation), and Out of Band (pairing info transmitted OOB, e.g. via Near Field Communication).

**Figure 24: Bluetooth Security Modes**

<b>Security Mode 1</b> If a BT $\geq$ 2.1 device is pairing with a BT $\leq$ 2.0 device, it falls back to BT 2.0 compatibility mode and behaves the same as BT 2.0. If both devices are BT $\geq$ 2.1, Secure Simple Pairing must be used according to the BT spec.	<b>Security Mode 2</b> If a BT $\geq$ 2.1 device is pairing with a BT $\leq$ 2.0 device, it falls back to BT 2.0 compatibility mode and behaves the same as BT 2.0. If both devices are BT $\geq$ 2.1, Secure Simple Pairing must be used according to the BT spec.	<b>Security Mode 3</b> If a BT $\geq$ 2.1 device is pairing with a BT $\leq$ 2.0 device, it falls back to BT 2.0 compatibility mode and behaves the same as BT 2.0. If both devices are BT $\geq$ 2.1, Secure Simple Pairing must be used according to the BT spec.
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#### **Security Mode 4: Simple Secure Pairing**

Simple Secure Pairing: a new security architecture introduced supported in BT  $\geq$  2.1. Service-level enforced, similar to mode 2. Mandatory when both devices are BT  $\geq$  2.1. There are four association models currently supported by mode 4. Security requirements for services must be classified as one of the following: authenticated link key required, unauthenticated link key required, or no security required. SSP improves security through the addition of ECDH public key cryptography for protection against passive eavesdropping and man-in-the-middle (MITM) attacks during pairing.

Numeric Comparison	Passkey Entry	Just Works	Out of Band (OOB)
Designed for situation where both devices are capable of displaying a six-digit number and allowing user to enter "yes" or "no" response. During pairing, user enters "yes" if number displayed on both devices matches to complete pairing. Differs from the use of PINs in legacy (BT $\leq$ 2.0) pairing because the number displayed for comparison is not used for subsequent link key generation, so even if it is viewed or captured by an attacker, it could not be used to determine the resulting link or encryption key.	Designed for situation where one device has input capability but no display (e.g. keyboard), while other device has a display. The device with a display shows a six-digit number, then the user enters this key on the device with input. As with numeric comparison, the six-digit number is not used in link key generation.	Designed for situation where one (or both) of the pairing devices has neither a display nor keyboard for entering digits (e.g. Bluetooth headset). It performs authentication step 1 in the same manner as as numeric comparison, but the user cannot verify that both values match, so MITM (man-in-the-middle) protection is not provided. This is the only model in SSP that does not provide authenticated link keys.	Designed for devices that support a wireless technology other than Bluetooth (e.g. NFC) for the purposes of device discovery and cryptographic value exchange. In the case of NFC, the OOB model allows devices to pair securely by simply tapping one device against the other, followed by the user accepting the pairing via a single button push. Security against eavesdropping and MITM attacks is dependant on the OOB technology.

Each mode, except for Just Works, has Man-In-The-Middle (MITM) protection, meaning no third device can view the data being passed between the two devices involved. The SSP mode is usually negotiated automatically based on the capabilities of both the master and slave. Lower security modes can be disabled via the `bluetooth.minimum_security_mode` SGD. The `bluetooth.minimum_security_mode` SGD sets the lowest security level at which the printer will establish a Bluetooth connection. The printer will always connect at a higher security level if requested by the master device. To change the security mode and security settings in the QLn Series printers, use Zebra Setup Utilities.

**Figure 25: Bluetooth Minimum Security Modes**

	BT Version of Master Device (>2.1)
bluetooth.minimum_security_mode=1	<b>Secure Simple Pairing</b> Just Works/Numeric Comparison
bluetooth.minimum_security_mode=2	<b>Secure Simple Pairing</b> Just Works/Numeric Comparison
bluetooth.minimum_security_mode=3	<b>Secure Simple Pairing</b> Numeric Comparison
bluetooth.minimum_security_mode=4	<b>Secure Simple Pairing</b> Numeric Comparison
bluetooth.bluetooth_PIN	Not Used



**bluetooth.minimum\_security\_mode** *sets the lowest security level at which the printer will establish a Bluetooth connection. The printer will always connect at a higher security level if requested by the master device.*

The QLn Series printers also feature bonding for Bluetooth. The printer caches pairing info so devices stay paired through power cycles and disconnects. This eliminates the need to re-pair on every connection establishment.

The `bluetooth.bonding` SGD is on by default.



**Note •** For detailed information on Bluetooth, please refer to the *Bluetooth Wireless User Guide (P1068791-001)* at:  
<http://www.zebra.com/us/en/support-downloads.html>

In addition, the QLn Series printers support Near Field Communication (NFC) technology. Using the “Print Touch” feature located on the side of the printer, end-users can automatically connect via Bluetooth from a handheld device that supports NFC technology. The NFC tag has the printer’s BDADDR encoded in a URL on the tag. Simply touching the NFC handheld device to the “Print Touch” icon on the printer will connect and pair the handheld device to the printer.

## **WLAN Overview**

QLn Series printers can be equipped with a radio that uses the industry standard 802.11 protocols. They will have the FCC ID number on the serial number label on the back of the unit.

- QLn Series Wireless Network Printers with the Zebra 802.11 WLAN radio module can be identified by the text “Wireless Network Printer” on the serial number label on the back of the printer.

- These printers allow communication as a node within a wireless local area network (WLAN). Methods of establishing communications to the printer will vary with each application.

More information and LAN configuration utilities are included in the Zebra Net Bridge™ program (version 2.8 and later). Zebra Setup Utilities (ZSU) can also be used to configure WLAN communications settings. Both Net Bridge and ZSU may be downloaded from the Zebra Web site.

## **Setting Up the Software**

QLn Series printers use Zebra’s CPCL and ZPL Programming languages which were designed for mobile printing applications. CPCL and ZPL are fully described in the ZPL Programming Guide (p/n P1012728-008) available on-line at [www.zebra.com/manuals](http://www.zebra.com/manuals).

You can also use Designer Pro, Zebra’s Windows® based label creation program which uses a graphical interface to create and edit labels in either language.

Refer to Appendix F for tips on downloading the Designer Pro application from Zebra’s Web site.

## Setting Up the Software

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You can also use Designer Pro, Zebra's Windows® based label creation program which uses a graphical interface to create and edit labels in either language.

Refer to Appendix G for tips on downloading the Designer Pro application from Zebra's Web site.

## Near Field Communication (NFC)

Much like Bluetooth and Wi-Fi technologies, Near Field Communication (NFC) allows wireless communication and data exchange between digital devices like smartphones. Yet NFC utilizes electromagnetic radio fields while technologies such as Bluetooth and Wi-Fi focus on radio transmissions instead.

NFC is an offshoot of Radio Frequency Identification (RFID), with the exception that NFC is designed for use by devices within close proximity to each other, i.e. a smartphone and a QLn Series printer. NFC allows these devices to establish communication with each other by touching them together or bringing them into proximity, usually no more than 7.62 centimeters (3 inches). Three forms of NFC technology exist: Type A, Type B, and FeliCa. All are similar but communicate in slightly different ways. FeliCa is commonly found in Japan.

Devices using NFC may be *active* or *passive*. A passive device, such as a QLn Series printer with an NFC tag, contains information that other devices can read but does not read any information itself.

An active device, such as a smartphone, can read the information on the printer's NFC tag, but the tag itself does nothing except transmit the info to authorized devices.

Active devices can read information and send it. An active NFC device, like a smartphone, would not only be able to collect information from NFC tags, but it would also be able to exchange information with other compatible phones or devices. An active device could even alter the information on the NFC tag if authorized to make such changes. To ensure security, NFC often establishes a secure channel and uses encryption when sending sensitive information.

**Figure 26: Near Field Communication (NFC) Pairing**



**Note •** Tapping the Zebra Print Touch™ icon  with a Near Field Communication (NFC) enabled smartphone will provide instant access to printer-specific information. For more information about NFC and Zebra products, go to <http://www.zebra.com/nfc>. Bluetooth pairing applications via NFC is also possible. Please see Zebra Multi-platform SDK for more information.

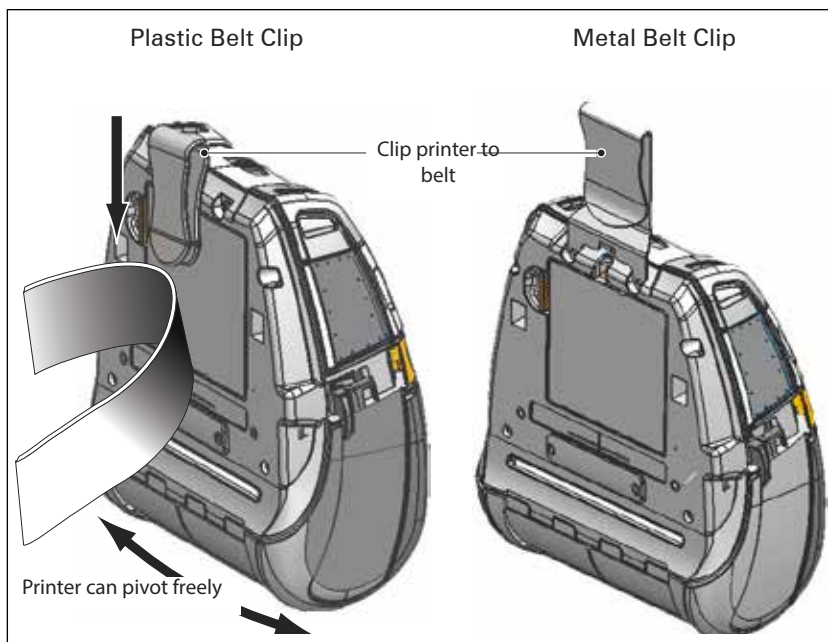
## QLn Series Accessories

### Swivel Belt Clip

Most QLn Series printers have a plastic swivel belt clip installed as a standard feature. (It should be noted that QLn220 & 320 printers with extended capacity battery do not come equipped with a belt clip.) To use: hook the clip over your belt, and ensure that the clip is securely attached to the belt. The belt clip will pivot to allow you to move freely while wearing the printer. The QLn420 also provides a more rigid metal belt clip as an option.

In order to install or remove the plastic Belt Clip you will need to remove the battery pack.

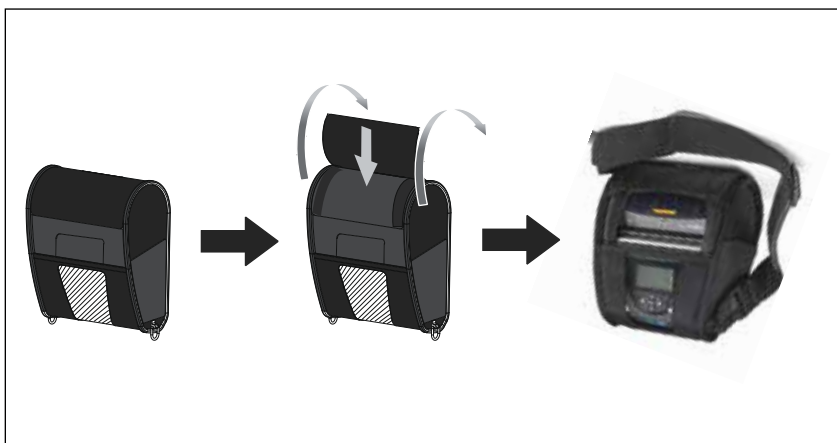
**Figure 27: Using the Belt Clip (QLn420 Shown)**



### Soft Case

QLn Series printers have soft case options that also allow you to carry the printer from your belt. The QLn420 soft case can be ordered through accessory kit number P1050667-017, the QLn320 is P1031365-029, and the QLn220 accessory kit is P1031365-044.

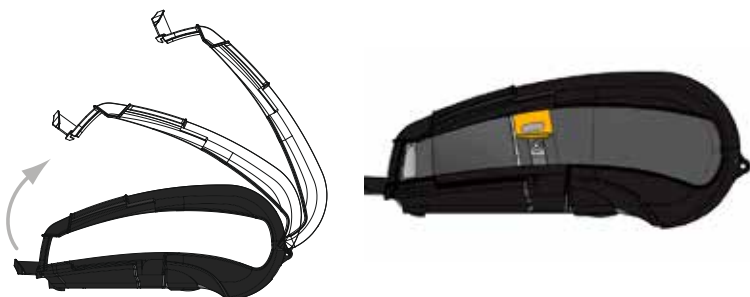
**Figure 28: Using the Soft Case**



### Hard Case

The QLn420 printer has a two piece hard case option that also allows you to carry the printer from your belt, while also providing increased protection for the printer. It pivots via a hinge located on the back and snaps into place in front as shown above. The metal belt clip is mounted to the hard case and printer with two screws. If no belt clip is used, two shorter screws are used to hold the printer to the hard case.

**Figure 29: Using the QLn420 Hard Case**



## Adjustable Shoulder Strap

Refer to Figure 30 if your printer is equipped with the shoulder strap option (p/n P1031365-092).

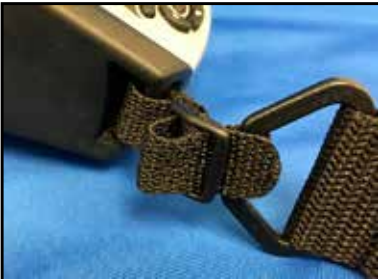
**Figure 30: Using the Optional Shoulder Strap**



1. Insert the end of the shoulder strap behind the post on the front side of the printer and loop it around the post.



2. Slide the end of the strap under the plastic buckle (circled).



3. Slide the end of the strap under the opposite side of the plastic buckle (as shown). Pull to tighten the strap inside the buckle.



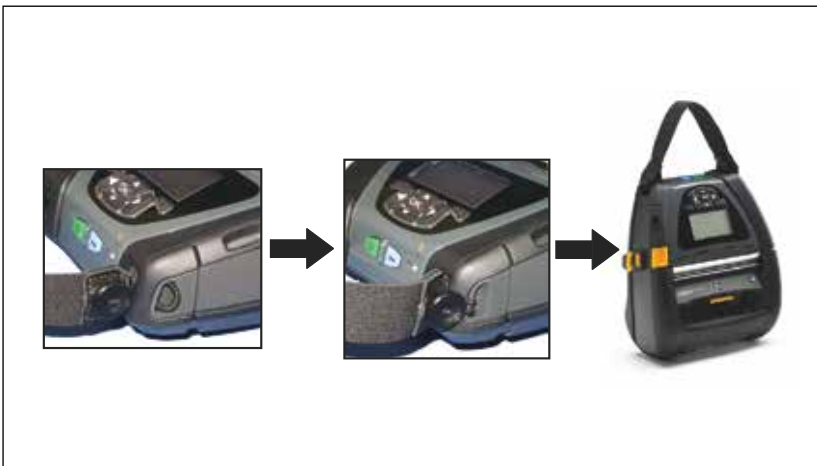
4. Repeat the same steps on the opposite side of the printer.

## Hand Strap

The QLn Series hand strap accessory (p/n P1031365-027) attaches to the printer's cut-outs as does the shoulder strap to provide the user with a convenient and secure method of carrying the printer. To attach the hand strap to the printer:

- Insert the end of the strap through the cut out on the front of the printer as shown below.
- Loop the end of the strap back around the cut out and secure it over the button.
- Repeat this process for the opposite end of the strap.

**Figure 31: Hand Strap (QLn420 Shown)**



The QLn Series printers also feature two mounting holes on the base of the printer to accommodate future mounting options. Refer to RAM Mount Installation Procedure (p/n AA17518-003) on [zebra.com](http://zebra.com).

# Preventive Maintenance

## Extending Battery Life

- Never expose the battery to direct sunlight or temperatures over 40° C (104° F) when charging.
- Always use a Zebra charger designed specifically for Lithium-Ion batteries. Use of any other kind of charger may damage the battery.
- Use the correct media for your printing requirements. An authorized Zebra re-seller can help you determine the optimum media for your application.
- If you print the same text or graphic on every label, consider using a pre-printed label.
- Choose the correct print darkness, and print speed for your media.
- Use software handshaking (XON/XOFF) whenever possible.
- Remove the battery if the printer won't be used for a day or more and you're not performing a maintenance charge.
- Consider purchasing an extra battery.
- Remember that any rechargeable battery will lose its ability to maintain a charge over time. It can only be recharged a finite number of times before it must be replaced. Always dispose of batteries properly. Refer to Appendix E for more information on battery disposal.

## General Cleaning Instructions



**Caution • Avoid possible personal injury or damage to the printer. Never insert any pointed or sharp objects into the printer. Always turn off the printer before performing any cleaning procedures. Use care when working near the tear bars as the edges are very sharp.**

---



**Warning • The printhead can get very hot after prolonged printing. Allow it to cool off before attempting any cleaning procedures.**

---



**Only use a Zebra cleaning pen (not supplied with the printer) or a cotton swab with 90% medical grade alcohol for cleaning the printhead.**

---



**Caution • Use only cleaning agents specified in the following tables. Zebra Technologies Corporation will not be responsible for damage caused by any other cleaning materials used on this printer.**

---

## QLn Series Cleaning

Area	Method	Interval
Printhead	Use a Zebra cleaning pen to swab the thin gray line on the printhead, cleaning the print elements from the center to the outside edges of the printhead.	After every five rolls of media (or more often, if needed). When using linerless type media, cleaning is required after every roll of media.
Platen Surface (Linered)	Rotate the platen roller and clean it thoroughly with a fiber-free swab, or lint free, clean, damp cloth lightly moistened with medical grade alcohol (90% pure or better) (Fig. 32a/Fig. 32b).	After every five rolls of media (or more often, if needed)
Platen Surface (Linerless)	Rotate platen roller and clean with a fiber-free swab and 1 part liquid soap (Palmolive or Dawn) and 25 parts water. Use pure water to clean after soap/water mixture.	Clean platen only if there is an issue during printing, i.e. media not releasing from the platen. (*See Note below.)
Scraper (Linerless Units Only)	Use adhesive side of media to clean scraper on linerless units. (Fig. 32b)	After every five rolls of media (or more often, if needed).
Tear Bar	Clean thoroughly with 90% medical grade alcohol and a cotton swab. (Fig. 32a)	As needed
Printer Exterior	Water-dampened cloth or 90% medical grade alcohol wipe.	As needed
Printer Interior	Gently brush out printer. Ensure the Bar Sensor and Gap Sensor windows are free of dust. (Fig. 32a)	As needed
Interior of units with Linerless Platens	Clean thoroughly with 90% medical grade alcohol and a fiber-free swab. (See Fig. 32b for specific target areas for interior cleaning.)	After every five rolls of media (or more often, if needed).

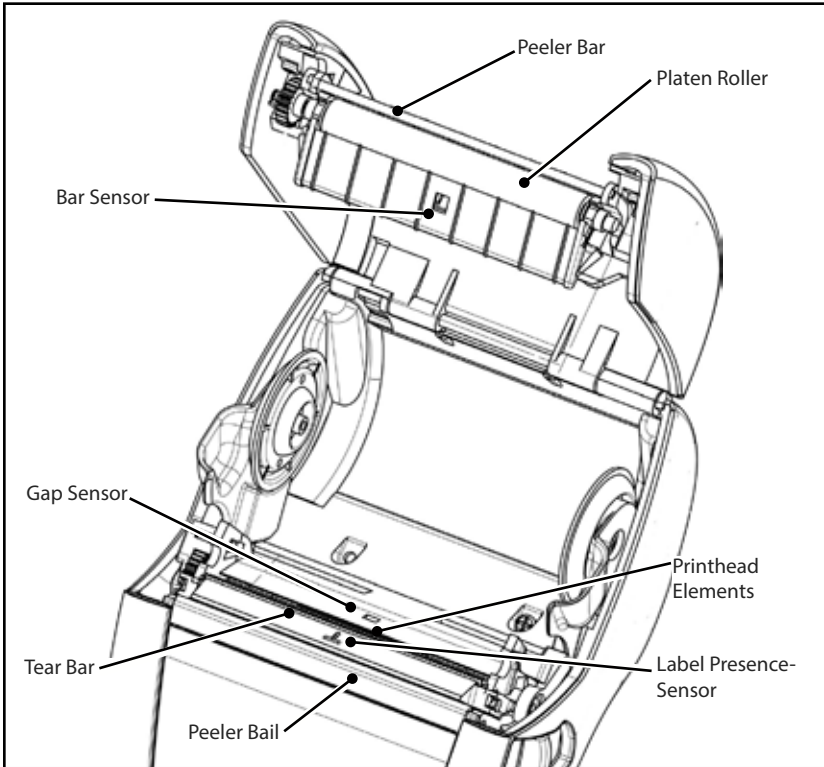


**Note:** This is an emergency procedure only to remove foreign contaminants (oils, dirt) from the platen that can damage the printhead or other printer components. This procedure will shorten or even exhaust the linerless platen's useable life. If the linerless media continues to jam after cleaning and feeding 1 to 2 meters (3 to 5 feet) of media, replace the platen.

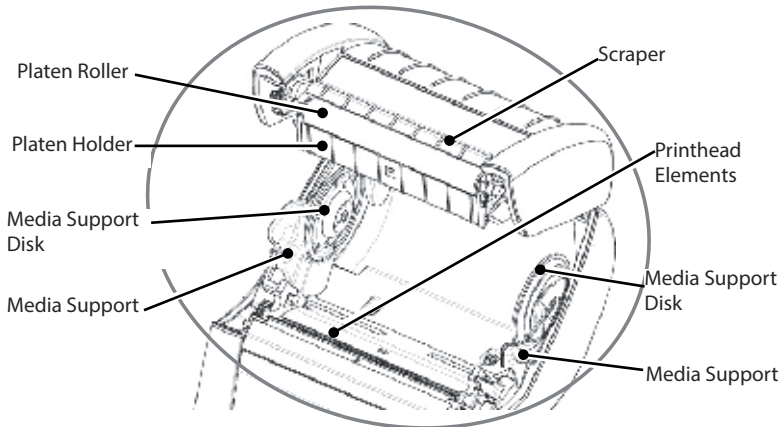


**Important:** The above cleaning procedures are not for QLn Healthcare printers. Refer to the Guide to Disinfecting and Cleaning QLn Healthcare Printers (p/n P1066640-001) for detailed cleaning instructions.

**Figure 32a: Cleaning the QLn Series Printers (Linered)**

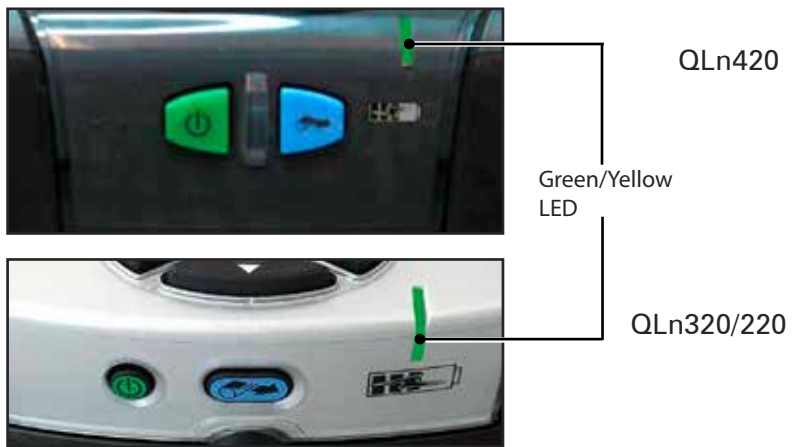


**Figure 32b: Cleaning the QLn Series Printers (Linerless)**

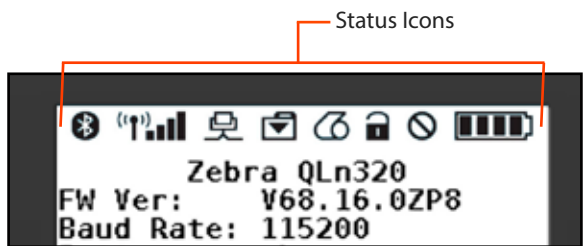


# Troubleshooting

**Figure 33: Control Panels**



Front Control Panel



LCD Control Panel



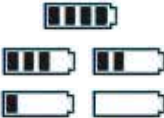




## Front Control Panel



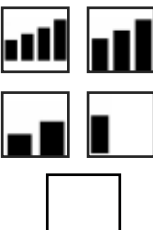
If the printer is not functioning properly, refer to the chart below to find the state of the LED charge indicator on the Front Control Panel. Then refer to the Troubleshooting topic referenced in the chart to resolve the problem. Please note that the charge LED is only on when DC power is applied to the printer. If no DC power is applied the LED is off, which does not apply to the table below.

Green	Yellow	Indication	Ref. to Topic
Solid	Off	Fully Charged	n/a
Off	Solid	Charging	n/a
Off	Off	Fault	1

# LCD Control Panel Indicators

The top of the display shows several icons which indicate the status of various printer functions. Check the indicator status, then refer to the Troubleshooting topic referenced in the chart to resolve the problem.

Icon	Status	Indication
	On	Bluetooth link established
	Not Present	Bluetooth link inactive
	Blinking	Connecting or transmitting labels
	Antenna Blinking	Looking for AP
	Antenna Blinking/1 Parenthesis Steady	WLAN Associated & Attempting Authentication
	Antenna and 2 Parentheses Steady	WLAN Associated and Authenticated
	Antenna and 2 Parentheses Blinking	Receiving Data
	Not Present	No Radio Present
	4 Bars	>80% charged
	3 Bars	60%-80% charged
	2 Bars	40%-60% charged
	1 Bar	20%-40% charged
	0 Bars	Low Battery
	4 Blinking w/ Lightning Bolt	Charging >80% Capacity
	3 Blinking w/ Lightning Bolt	Charging 60-80% Capacity
	2 Blinking w/ Lightning Bolt	Charging 40-60% Capacity
	1 Blinking w/ Lightning Bolt	Charging 20-40% Capacity
	0 Bars w/ Lightning Bolt	Charging <20% Capacity
	Blinking	Media cover open
	Blinking	Receiving data
	Steady	Ethernet Connected
	Not Present	No Ethernet Connection
	Blinking	Data processing in progress
	Steady	No data being processed

	Blinking	Out of Media
	Steady	Media present
	Blinking	Error exists (excluding Media Out and Head Latch Open)
	Not Present	No error exists
	4 Bars	802.11 signal strength > 75%
	3 Bars	802.11 signal strength <= 75%
	2 Bars	802.11 signal strength <= 50% but >25%
	1 Bar	802.11 signal strength <= 25%
	0 Bars	No Signal Strength

## Troubleshooting Topics

### 1. No power:

- Check that battery is installed properly.
- Recharge or replace battery as necessary.



**Caution:** Always dispose of batteries properly. Refer to Appendix F for more information on proper battery disposal.

### 2. Media does not feed:

- Be sure media cover is closed and latched.
- Check spindle holding media for any binding.
- Ensure most recently printed label is removed (only in peel mode).
- Ensure label sensor is not blocked.

### 3. Poor or faded print:

- Clean print head.
- Check quality of media.

### 4. Partial or missing print:

- Check media alignment.
- Clean print head.
- Ensure media cover is properly closed and latched.

### **5. *Garbled print:***

- Check baud rate.

### **6. *No print:***

- Check baud rate.
- Replace battery.
- Check cable to terminal.
- Establish RF Link and/or restore LAN associativity.
- Invalid label format or command structure. Place printer in Communications Diagnostic (Hex Dump) Mode to diagnose problem.

### **7. *Reduced battery charge life:***

- If battery is older than 1 year old, short charge life may be due to normal aging.
- Check battery health.
- Replace battery.

### **8. *flashing:***

- Flashing Data icon is normal while data is being received.

### **9. or *flashing:***

- Check that media is loaded and that the media cover is closed and securely latched.

### **10. *Communication error:***

- Check baud rate.
- Replace cable to terminal.

### **11. *Label jam:***

- Open head release latch and media cover.
- Remove and reinstall media.

### **12. *Skip Labels:***

- Check media for top of form sense mark or label gap.
- Check that the maximum print field has not been exceeded on label.
- Ensure bar or gap sensor is not blocked or malfunctioning.

### **13. Blank LCD screen:**

- Make sure printer is turned on.
- No application loaded or application corrupted: reload program.

### **14. No NFC Connectivity**

- Ensure smartphone is positioned 3 inches (7.62 cm) or closer to the Print Touch icon on the side of the printer.

## **Troubleshooting Tests**

### **Printing a Configuration Label**

To print out a listing of the printer's current configuration follow these steps:

1. Turn the printer off. Load the media compartment with journal media (media with no black bars printed on the back).
2. Press and hold the Feed Button.
3. Press and release the Power button and keep the Feed button pressed. When printing starts, release the Feed button.



**Note:** *The configuration report can also be printed from the Info (Help) menu on the LCD.*

---

Refer to Figures 34, 34a, and 34b for sample configuration print-outs.

### **Communications Diagnostics**

If there is a problem transferring data between the computer and the printer, try putting the printer in the Communications Diagnostics Mode (also referred to as the "DUMP" mode). The printer will print the ASCII characters and their text representation (or the period '.', if not a printable character) for any data received from the host computer.

To enter Communications Diagnostics Mode:

1. Print a configuration label as described above.
2. At the end of the diagnostics report, the printer will print: "Press FEED key to enter DUMP mode".
3. Press the FEED key. The printer will print: "Entering DUMP mode".

To enter Communications Diagnostics Mode:

1. Print a configuration label as described above.
2. At the end of the diagnostics report, the printer will print: "Press FEED key to enter DUMP mode".
3. Press the FEED key. The printer will print: "Entering DUMP mode".



**Note • If the FEED key is not pressed within 3 seconds, the printer will print "DUMP mode not entered" and will resume normal operation.**

---

4. At this point, the printer is in DUMP mode and will print the ASCII hex codes of any data sent to it, and their text representation (or "." if not a printable character).

Additionally, a file with a ".dmp" extension containing the

ASCII information will be created and stored in the printer's memory. It can be viewed, "cloned" or deleted using the Net Bridge application. (Refer to the Net Bridge documentation for more information.)

To terminate the Communications Diagnostics Mode and return the printer to normal operations:

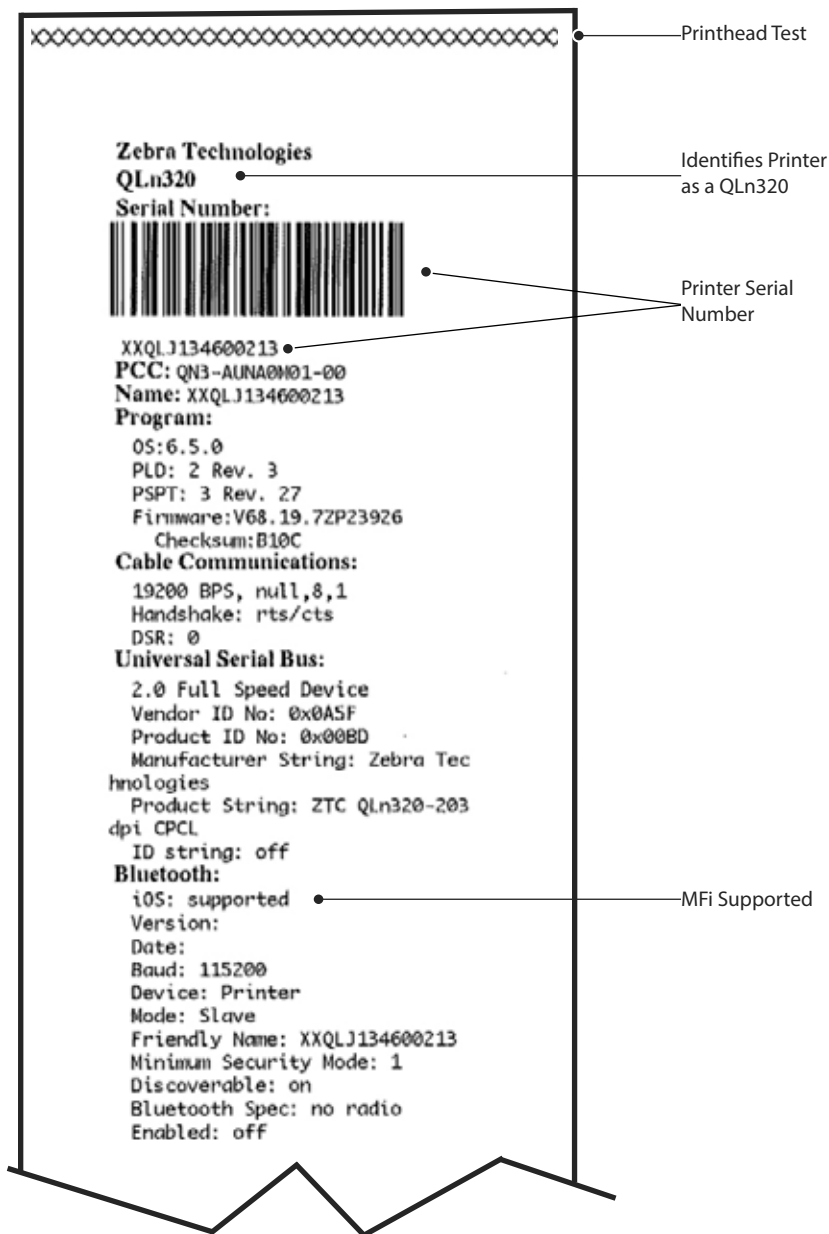
1. Turn the printer OFF.
2. Wait 5 seconds.
3. Turn the printer ON.

### Contacting Technical Support

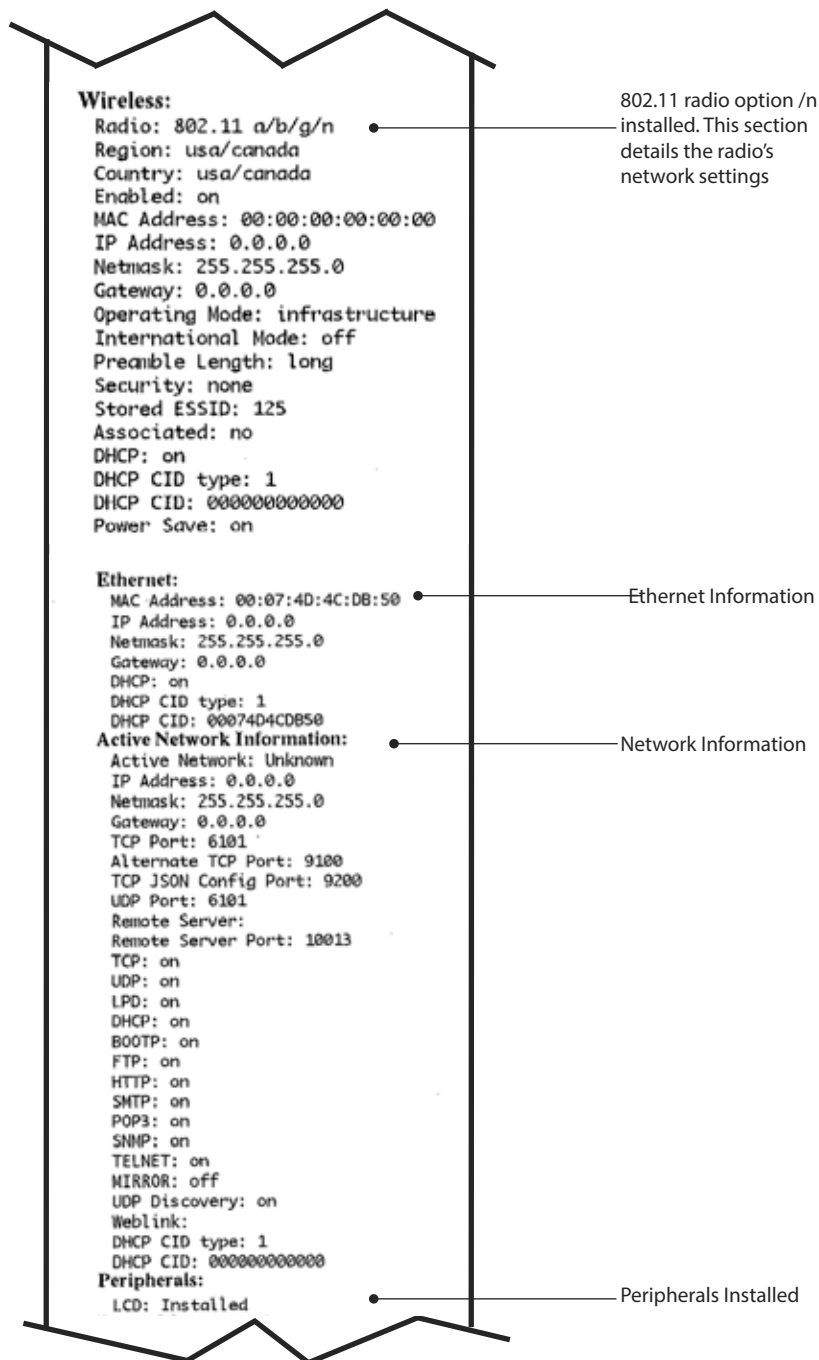
If the printer fails to print the configuration label, or you encounter problems not covered in the Troubleshooting Guide, contact Zebra Technical Support. Technical Support addresses and phone numbers for your area can be found in Appendix H of this manual. You will need to supply the following information:

- Model number and type (e.g. QLn320)
- Unit serial number (Found on the large label on the back of the printer, also found in the configuration label printout.
- Product Configuration Code (PCC) (15 digit number found on the label on the back of the unit)

**Figure 34: QLn320 Configuration Label**



**Figure 34a: QLn320 Configuration Label (cont.)**



**Figure 34b: QLn320 Configuration Label (cont.)**

**Power Management:**  
 In-activity Timeout:1200 Secs  
 Low-battery Timeout:60 Secs  
 Remote(DTR) pwr-off:Enabled  
 Voltage :7.88  
 Low-bat Warning :176  
 Low-bat Shut-down:166  
 Power On Cycles :16  
 Battery Health :good  
 Battery Cycle Count:0

**Memory:**  
 Flash :67184464 Bytes  
 RAM :8348608 Bytes

**Label:**  
 Width :576 dots, 72 mm  
 Height:65535 dots, 8191 mm  
 Sensors: (Adj)  
 Pres[DAC:218,Thr:60,Cur:221]  
 Label Removed

**Media [166 (614 dots)]**  
 Gap [DAC:255,Thr:50,Cur:80]  
 Bar [DAC:255,Thr:70,Cur:9]  
 Temperature :27C (100)  
 Voltage :7.9V (202)

**Resident Fonts:**

Font	Sizes	Chars
0	0- 6	20-FF
1	0	20-80
2	0- 1	20-59
4	0- 7	20-FF
5	0- 3	20-FF
6	0	20-44
7	0- 1	20-FF

**File Directory:**

File	Size
E:TT0003H_.TTF	169188

66939392 Bytes Free

**Command Language:**  
 CCL Key '['[21]

**ZPL Configuration Information:**  
 Rewind.....Print Mode  
 Mark.....Media Type  
 10.0.....Darkness  
 +00.....Tear Off Adjust  
 2030.....Label Length  
 48mm.....Print Width  
 7Eh.....Control Prefix  
 5Eh.....Format Prefix  
 2Ch.....Delimiter  
 00.....Top Position  
 No Motion....Media Power Up  
 Feed.....Media Head Closed  
 00.....Left Margin  
 384.....Dots per row  
 End ZPL Configuration

End of report.

Press FEED key to enter DUMP mode.

Dump mode not entered.

# Specifications



**Note • Printer specifications are subject to change without notice.**

## Printing Specifications

Parameter	QLn320	QLn220	QLn420
Print Width	Up to 74 mm (2.91 in.)	Up to 48 mm (1.89 in.)	Up to 104 mm (4.1 in.)
Print Speed	101.6 mm (4 in.)/second without peeler	Same	Same
	50.8 mm (2 in.)/second with peeler	Same	Same
Printhead Burn Line to Tear Edge Distance	5.08 mm (0.20 in.)	4.31 mm (0.17 in.)	4.06 mm (0.16 in.)
Printhead Life	2 million inches of paper feed	Same	Same
Print Density	203 dots/in. or better	Same	Same

## Memory and Communications Specifications

Parameter	QLn Series Printers
Flash Memory	256 MB <sup>1</sup>
RAM Memory	128 MB <sup>1</sup>
Standard Communications	RS-232 serial port (14 Pin serial connector) Configurable Baud rate (from 9600 to 115.2 Kbps), parity and data bits. Software (X-ON/X-OFF) or hardware (DTR/STR) communication handshake protocols.
	USB 2.0 Full Speed Interface (12 Mbps)
Optional Wireless Communication	Bluetooth v2.1 compatible 2.4 GHz SRRF link
	Optional wireless LAN capabilities comply with 802.11a/b/g/n protocols QLn420: BT 3.0 and 802.11a/b/g/n
Real Time Clock (RTC)	Time and date under application control. Refer to ZPL Programming Manual, available at <a href="http://www.zebra.com/manuals">www.zebra.com/manuals</a> for RTC commands.
Ethernet	10 or 100 mps Ethernet auto detect when docked in cradle.

1. Memory configuration on your printer may be ascertained by printing a configuration label as detailed on page 66.

## Label Specifications

Parameter	QLn320	QLn220	QLn420
Max Media Width	25.4 to 79.4 mm (1.0 to 3.125 in.)	16 to 55.37 mm (.63 to 2.18 in.)	50.8 to 111.76 mm (2.0 to 4.4 in.)
Max/Min Label Length	12.7 to 812.8 mm (0.5 to 32 in.) maximum	Same	Same
Black Bar Sensor to Printhead Burnline Distance	15.87 mm (0.62 in.) +/- 0.635 mm (0.025 in.)	13,46 mm (0.53 in.)	15.87 mm (0.62 in.) +/- 0.635 mm (0.025 in.)
Label Thickness	0.058 to 0.165 mm (0.002 to .0065 in.)	0.058 to 0.140 mm (0.002 to .0055 in.)	0.061 to 0.190 mm (0.0024 to 0.0075 in.)
Max Tag/Receipt Thickness	0.152 mm (0.006 in.)	0.152 mm (0.006 in.)	0.190 mm (0.0075 in.)
Max Label Roll Outer Diameter	66.8 mm (2.6 in.)	55.8 mm (2.2 in.)	66.8 mm (2.6 in.)
Inner Core Diameters**	19 mm (0.75 in.) or 35.05 mm (1.38 in.) min. for lined	Same	Same
	35.05 mm (1.38 in.) min. for linerless	Same	Same
Black Mark Location	The reflective media black marks should be centered on media roll	Same	Same
Black Mark Dimensions	Minimum mark width: 12,7 mm (0.5 in.) perpendicular to inside edge of media, centered within the width of the roll. Mark length: 3-11 mm (0.12 to 0.43 in.) parallel to inside edge of media.)	Same	Same



**Note • Use Zebra brand direct thermal media that is outside wound. Media may be reflective (black mark) sensing, or transmissive (gap) sensing, die-cut, continuous or linerless. For die-cut labels, use only full auto dies.**

**\*\* QLn Series printers support coreless media which is 19 mm (0.75 in.) in inner diameter.**

## CPCL Font and Bar Code Specifications and Commands

<b>Standard Fonts</b>	25 bit-mapped fonts; 1 scalable font (CG Trimvirate Bold Condensed*) *Contains UFST from Agfa Mono-type Corporation Downloadable optional bit-mapped & scalable fonts via Net Bridge software.	
<b>Available Optional Fonts</b>	Optional International character sets: Chinese 16 x 16 (trad), 16 x 16 (simplified), 24 x 24 (simplified); Japanese 16 x 16, 24 x 24	
<b>Linear Bar Codes Available</b>	<b>Barcode (CPCL Command)</b>	
	Aztec (AZTEC) Codabar (CODABAR, CODABAR 16) UCC/EAN 128 (UCCEAN128) Code 39 (39, 39C, F39, F39C) Code 93 (93) Code 128 (128) EAN 8, 13, 2 and 5 digit extensions (EAN8, EAN82, EAN85, EAN13, EAN132, and EAN135) EAN-8 Composite (EAN8) EAN-13 Composite (EAN13) Plessey (PLESSEY) Interleaved 2 of 5 (I2OF5) MSI (MSI, MSI10, MSI1110) FIM/POSTNET (FIM) TLC39 (TLC39) UCC Composite A/B/C (128(Auto)) UPCA, 2 and 5 digit extensions (UPCA2 and UPCA5) UPCA Composite (UPCA) UPCE, 2 and 5 digit extensions (UPCE2 and UPCE5) UPCE Composite (UPCE) MaxiCode (MAXICODE) PDF 417 (PDF-417) Datamatrix (using ZPL emulation) (DATAMATRIX) QR Code (QR)	
<b>2-D Bar Codes Available</b>	<b>RSS:</b>	RSS-14 (RSS-Subtype 1) RSS-14 Truncated (RSS-Subtype 2) RSS-14 Stacked (RSS-Subtype 3) RSS-14 Stacked Omnidirectional (RSS-Subtype 4) RSS Limited (RSS-Subtype 5) RSS Expanded (RSS-Subtype 6)
<b>Rotation Angles</b>	0°, 90°, 180°, and 270°	

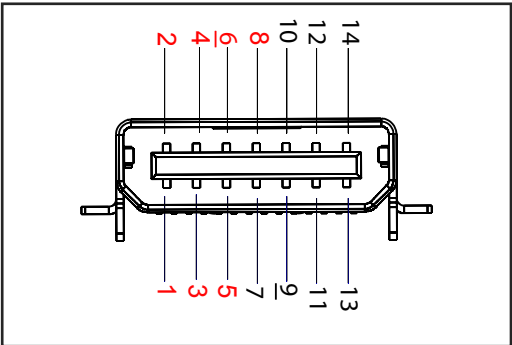
## ZPL Font and Bar Code Specifications and Commands

<b>Standard Fonts</b>	15 bit-mapped fonts; 1 scalable font (CG Trimvirate Bold Condensed*) Downloadable optional bit-mapped & scalable fonts via Net Bridge software.
<b>Available Optional Fonts</b>	Zebra offers font kits covering multiple languages including Simplified and Traditional Chinese, Japanese, Korean, Hebrew/Arabic, and others.
<b>Linear Bar Codes Available 2-D Bar Codes Available</b>	<b>Barcode (CPCL Command)</b>
	Aztec (^B0) Codabar (^BK) Codablock (^BB) Code 11 (^B1) Code 39 (^B3) Code 49 (B4) Code 93 (^BA) Code 128 (^BC) DataMatrix (^BX) EAN-8 (^B8) EAN-13 (^BE) GS1 DataBar Omnidirectional (^BR) Industrial 2 of 5 (^BI) Interleaved 2 of 5 (^B2) ISBT-128 (^BC) LOGMARS (^BL) Micro-PDF417 (^BF) MSI (^BM) PDF-417 (^B7) Planet Code (^B5) Plessey (^BP) Postnet (^BZ) Standard 2 of 5 (^BJ) TLC39 (^BT) UPC/EAN extensions (^BS) UPC-A (^BU) UPC-E (^B9) Maxi Code (^BD) QR Code (^BQ)
<b>Rotation Angles</b>	0°, 90°, 180°, and 270°

# Communication Ports

## RS-232C

Pin #	Signal Name	Type	Description
1	CTS	input	Clear To Send from host
2	TXD	output	Transmit Data
3	RXD	input	Receive Data
4	DSR	input	Data Set Ready: low to high transition turns printer on, high to low transition turns printer off (if enabled)
5	GND		Ground
6	DTR	output	Data Terminal Ready: set high when printer is on. Switched 5V (300mA max)
7	N/A		Do Not Use
8	RTS	output	Request To Send set high when printer is ready to accept a command or data
9	N/A		Do Not Use
10	N/A		Do Not Use
11	N/A		Do Not Use
12	N/A		Do Not Use
13	N/A		Do Not Use
14	N/A		Do Not Use



**Figure 35: RS-232C Communications Port**

USB

Pin #	Signal Name	Type	Description
1	VBUS	-	USB Bus Power
2	USB-	bi-directional	I/O signals
3	USB+	bi-directional	I/O signals
4	USB_ID	-	Identifies A/B connector
5	Return		Ground

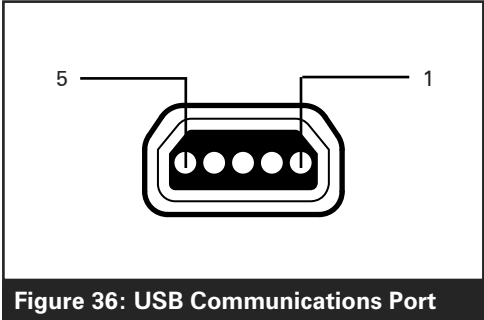
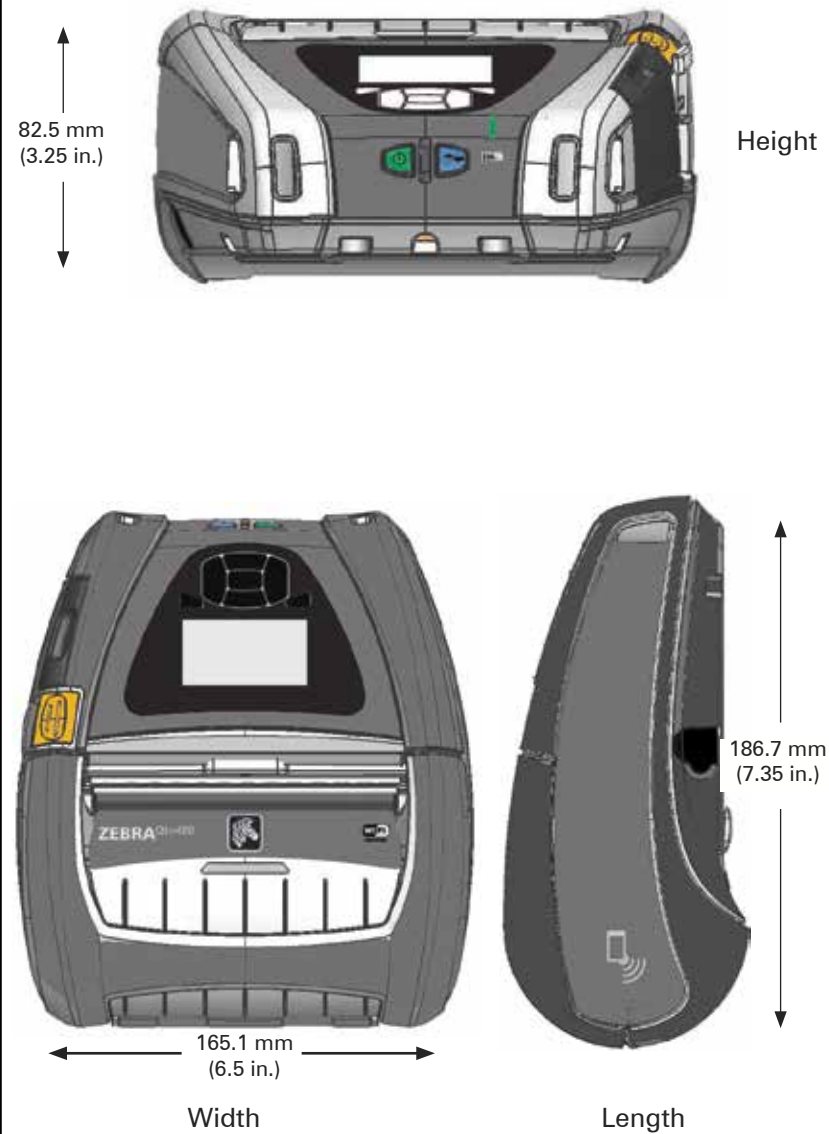


Figure 36: USB Communications Port

Physical, Environmental and Electrical Specifications

Parameter	QLn320	QLn220	QLn420
Weight w/ battery	1.6 lbs. (0.75 kg)	1.35 lbs. (0.61 kg)	2.2 lbs. (0.99 kg)
Temperature	Operating: -20 °C to 50 °C (-4 °F to 122 °F) (Healthcare is 0 °C to 50 °C (32 °F to 122 °F)	Operating: -20 °C to 55 °C (-4 °F to 131 °F) (Healthcare is 0 °C to 50 °C (32 °F to 122 °F)	Operating: -20 °C to 50 °C (-4 °F to 122 °F)
	Storage: -25 °C to 65 °C (-13 °F to 149 °F)	Same	Same
	Charging: 0 °C to 40°C (32 °F to 104 °F)	Same	Same
Relative Humidity	Operating/Storage: 10% to 90% non-condensing	Same	Same
Battery	Smart Battery (2 or 4 cell) Lithium-Ion, 7.4 VDC (nominal); 2.45 Ahr min.	Same	Same
	4 cell Extended Smart Battery (Optional)	4 cell Extended Smart Battery (Optional)	
Intrusion Protection (IP) Rating	IP43 (without optional environmental case) IP54 (with case)	IP43 (without optional environmental case) IP54 (with case)	IP43 (without optional environmental case) IP54 (with case)

**Figure 37: QLn420 Overall Dimensions**



**Figure 38: QLn320 Overall Dimensions**



**Figure 39: QLn220 Overall Dimensions**



## QLn Series Accessories

Part #	Description
P1031365-006	KIT ACC QLn220 RUBBER DOOR I/O (15)
P1031365-018	KIT ACC QLn320 RUBBER DOOR I/O (15)
P1031365-019	KIT ACC QLn220/QLn320 RUBBER DOOR DC JACK (15)
P1031365-022	KIT ACC QLn220/320 PLATEN GEAR 48P 22T (25)
P1031365-024	KIT ACC Mobile AC ADAPTER US (type A) cord
P1031365-027	KIT ACC QLn HAND STRAP
P1031365-028	KIT ACC QLn BELT CLIP REPLACEMENT (20)
P1031365-029	KIT ACC QLn320 SOFT CASE (Includes Shoulder Strap)
P1031365-033	KIT ACC QLn-EC AC ADAPTER US (type A) CORD (see Sales for other countries)
P1031365-038	KIT ACC QLn-EC
P1031365-044	KIT ACC QLn220 SOFT CASE (Includes Shoulder Strap)
P1031365-045	KIT ACC QLn-EC4 AC ADAPTER US CORD (see Sales for other countries)
P1031365-050	KIT ACC EC4 WALL MOUNT
P1031365-052	KIT ACC QLn Serial Cable (with strain relief) QL Adapter (female DIN)
P1031365-053	KIT ACC QLn Serial Cable, 6' (with strain relief) PC-DB9
P1031365-054	KIT ACC QLn Serial Cable (with strain relief) to MC9000
P1031365-055	KIT ACC QLn PC-USB Cable, 6' (with strain relief)
P1031365-056	KIT ACC QLn Serial Cable (with strain relief) RJ45 to Telzon Adapter
P1031365-057	KIT ACC QLn Serial Cable (with strain relief) to LS2208 Scanner
P1031365-058	KIT ACC QLn 16 PIN Serial Cable (with strain relief) to MC3000
P1031365-059	KIT ACC QLn220/QLn320 Spare Battery Smart
P1031365-060	KIT ACC QLn 11 PIN Serial Cable (with strain relief) to MC3000
P1031365-061	KIT ACC QLn Serial DEX Cable (with strain relief)
P1031365-062	KIT ACC QLn Serial Cable (with strain relief) to RJ45
P1031365-063	Kit ACC SC2 Li-ION Smart Charger, US (type A) cord (see Sales for other countries)
P1031365-069	KIT, Acc QLn220/320 and ZQ500 Series Spare Extended Battery with LED's
P1031365-092	KIT ACC QLn SERIES SHOULDER STRAP

## QLn Series Accessories cont.

P1031365-104	KIT ACC QLn Serial Cable (with strain relief) to LS2208 Scanner Extended
P1050667-007	KIT ACC QLn420 RUBBER DOOR I/O (15)
P1050667-010	KIT ACC QLn420 RUBBER DOOR DC JACK (15)
P1050667-016	KIT ACC QLn420 SPARE BATTERY
P1050667-017	KIT ACC QLn420 SOFT CASE (Includes Shoulder Strap)
P1050667-018	KIT ACC QLn420-EC AC ADAPTER US (type A) CORD (see Sales for other countries)
P1050667-026	KIT ACC QLn420-VC – 15V – 60V to 12V
P1050667-029	KIT ACC QLn420-EC (NO ADAPTER, NO CORD)
P1050667-030	KIT ACC QLn420-VC (no adapter, no cord)
P1050667-031	KIT ACC QLn420 METAL BELT CLIP
P1050667-032	KIT ACC QLn420 Handi-Mount (compact, flexible RAM arm) with Base Plate
P1050667-033	KIT ACC QLn420 Handi-Mount (compact, flexible RAM arm) without Base Plate
P1050667-034	KIT ACC QLn420 ASSY HARD CASE W/METAL BELT CLIP
P1050667-035	KIT ACC QLn420 Mobile Mount for Forklifts (with U-arm bracket and fanfold bin)
P1050667-036	KIT ACC QLn420 SCREEN SCRATCH PROTECTOR OVERLAY (25)
P1050667-037	KIT ACC QLn420 MOBILE MOUNT PLATE
P1050667-038	KIT ACC QLn420 DESKTOP STAND
P1050667-039	KIT ACC QLn420 SOFT CASE W/O SHOULDER STRAP
P1050667-040	KIT ACC QLn420 BATTERY ELIMINATOR WITH POWER ADAPTER
P1050667-041	KIT ACC QLn420 BATTERY ELIMINATOR NO ADAPTER
P1050667-042	KIT, Acc Power Adapter for Mobile Battery Eliminator, 12~48V, open ended
P1050667-047	KIT ACC QLn420 RAM MOUNT PLATE
P1024458-002	BELT,CLIP,QLN,HC
AC18177-5	Model UCLI72-4 Quad Battery Charger (US line cord, see Sales for others)
P1051378-002	BATTERY,PACK,LITHIUM,SMART,QLN HC

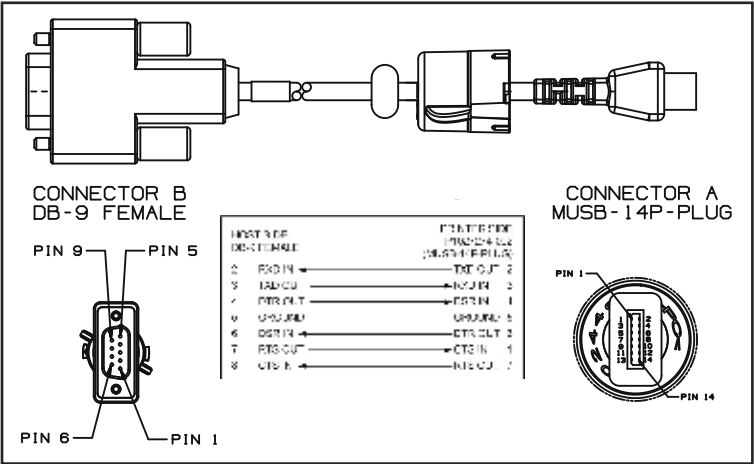


**Note • Refer to Appendix A for additional information on Data I/O cables.**

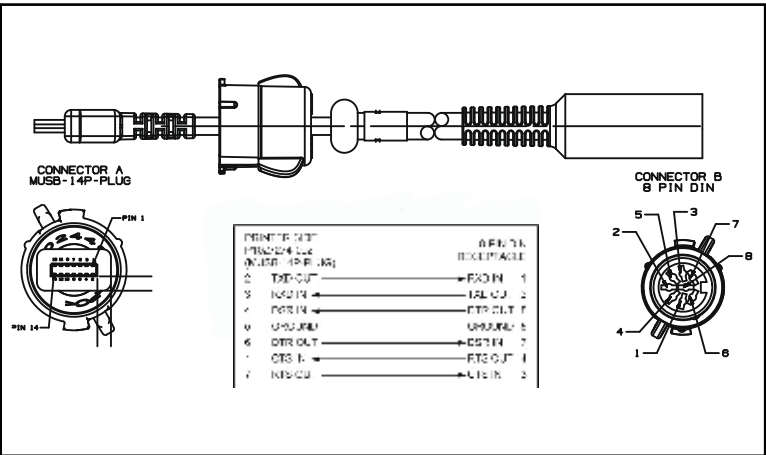
# Appendix A

## Interface Cables (RS-232 Cables)

Part Number P1031365-053; DB-9 to 14-Pin Serial

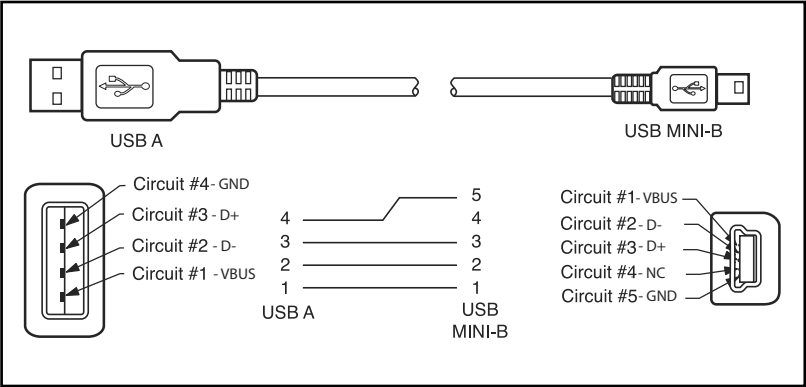


Part Number P1031365-052; 8-Pin DIN to 14-Pin Serial Cable

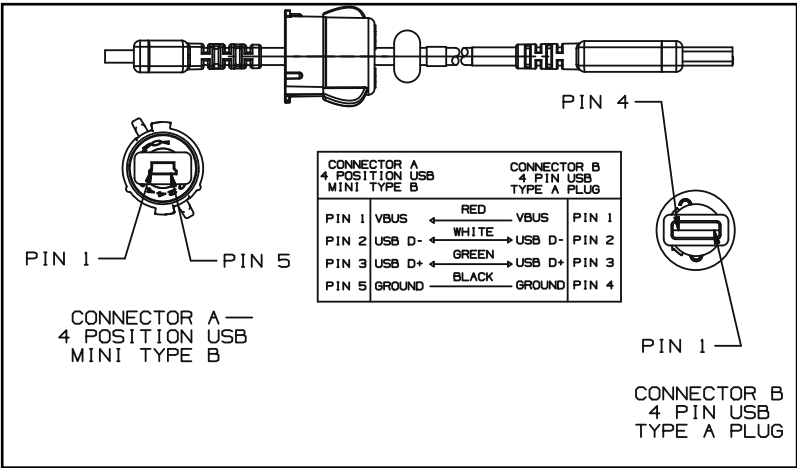


USB Cables

Part Number AT17010-1; USB A to USB Mini B Cable



Part Number P1031365-055; 4 Position USB Mini to 4-Pin USB (w/ Strain Relief)



**Note • Visit the Zebra website at: [www.zebra.com/accessories](http://www.zebra.com/accessories) for a listing of interface cables for all Zebra mobile printers.**

## **Appendix B**

### **Media Supplies**

To insure maximum printer life and consistent print quality and performance for your individual application, it is recommended that only media produced by Zebra be used.

Advantages include:

- Consistent quality and reliability of media products.
- Large range of stocked and standard formats.
- In-house custom format design service.
- Large production capacity which services the needs of many large and small media consumers including major retail chains world wide.
- Media products that meet or exceed industry standards.

For more information go the Zebra website ([www.zebra.com](http://www.zebra.com)) and select the Products tab, or refer to the CD included with the printer.

## **Appendix C**

### **Maintenance Supplies**

In addition to using quality media provided by Zebra, it is recommended that the printer be cleaned as prescribed in the maintenance section. The following item is available for this purpose:

- Cleaning Pen (12 pack): p/n 105950-035


# Appendix D




**Note • The following menus in this Appendix apply only to QLn420 and QLn Healthcare printers.**




## SETTINGS Menu

DARKNESS  -49



Set the darkness to the lowest setting that provides good print quality. If you set darkness too high, the label image may print unclearly, bar codes may not scan correctly, or the printhead may wear prematurely.

PRINT SPEED  4.0


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

MEDIA TYPE  MARK


Select the type of media that you are using.

TEAR OFF  0


If necessary, adjust the position of the media over the tear-off bar after printing.

<p>PRINT WIDTH</p> <p>576</p>
<p>⬆</p>

Specify the width of the labels being used. The default value is the maximum width for the printer based on the printhead's DPI value.

<p>PRINT MODE</p> <p>REWIND</p>
<p>⬆</p>

Select a print mode that is compatible with your printer options.

<p>LABEL TOP</p> <p>0</p>
<p>⬆</p>

<p>LEFT POSITION</p> <p>0</p>
<p>⬆</p>

If necessary, shift the print position horizontally on the label. Positive numbers move the left edge of the image toward the center of the label by the number of dots selected, while negative numbers move the left edge of the image toward the left edge of the label.

<p>REPRINT MODE</p> <p>OFF</p>
<p>⬆</p>

When reprint mode is enabled, you can reprint the last label printed either by issuing certain commands or by pressing the DOWN ARROW on the keypad.

LABEL LENGTH MAX
39
⬆

Set the maximum label length to a value that is at least 1.0 in. (25,4 mm) greater than the actual label length plus the interlabel gap. If you set the value to one that is smaller than the label length, the printer assumes that continuous media is loaded, and the printer cannot calibrate.

LANGUAGE
▼ ENGLISH ▲
⬆

If necessary, change the language that the printer displays.




---

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

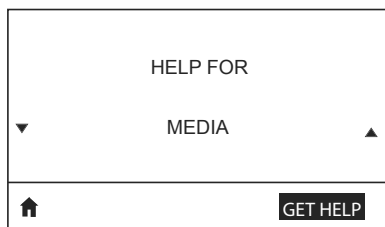
---

If necessary, shift the print position horizontally on the label. Positive numbers move the left edge of the image toward the center of the label by the number of dots selected, while negative numbers move the left edge of the image toward the left edge of the label.

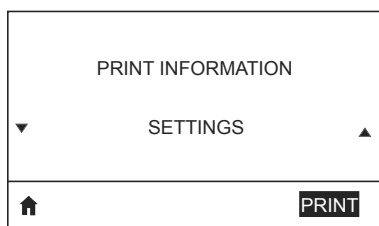
When reprint mode is enabled, you can reprint the last label printed either by issuing certain commands or by pressing the LEFT ARROW on the keypad.



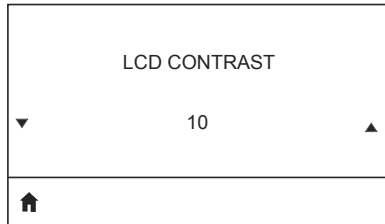
## TOOLS Menu



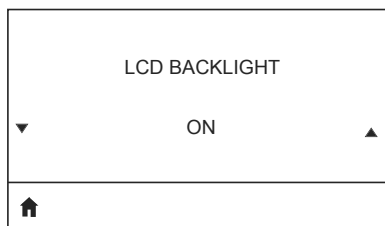
Use scrolling feature to select from a variety of help topics including how to load media, location and removal of battery, and cleaning the printhead. There are also explanations of various icons including battery, error, latch, media, RCV data, Ethernet, signal, WLAN, and Bluetooth.



Prints a printer configuration label, sensor profile, barcode information, font information, images, formats, two-key report, and network settings..



Changes the contrast on the printer's display (i.e. the higher the number, the darker the contrast).



Allows the user to turn the LCD backlight on or off.

<p>BACKLIGHT TIMEOUT</p> <p>10</p>
<p>🏠</p>

Sets the duration of the LCD backlight in seconds.

<p>IDLE DISPLAY</p> <p>FW VERSION</p>
<p>🏠</p>

Select the information shown on the printer's display when the printer is idle.

<p>POWER UP ACTION</p> <p>NO MOTION</p>
<p>🏠</p>

Set the action for the printer to take during the power-up sequence, i.e. no motion, calibrate, etc.

<p>HEAD CLOSE ACTION</p> <p>FEED</p>
<p>🏠</p>

Set the action for the printer to take when you close the printhead, i.e. feed, calibrate, etc.

<p>LABEL LENGTH CAL</p>
<p>🏠</p>

DIAGNOSTIC MODE	
▼	ENABLED ▲
🏠	

Use this diagnostic tool to cause the printer to output the hexadecimal values for all data received by the printer.

ZBI ENABLED?	
▼	NO ▲
🏠	

This menu item indicates if the Zebra Basic Interpreter (ZBI 2.0™) option is enabled on your printer.



## NETWORK Menu

ACTIVE PRINT SERVER
NONE

Informs the user of the presence of an active server. Only one print server can be installed at a time, therefore the print server installed is the active print server.

WLAN STATUS
NOT ASSOCIATED

Informs the user if WLAN is associated or not associated.

WLAN IP ADDRESS
0.0.0.0


View, and if necessary, change the printer's WLAN IP address.

WLAN SUBNET MASK
255.255.255.0


View, and if necessary, change the WLAN subnet mask.

WLAN GATEWAY
0.0.0.0


View, and if necessary, change the default WLAN gateway.

WLAN IP PROTOCOL
ALL



This parameter tells if the user or the server selects the WLAN IP address.

WLAN MAC ADDRESS
00:19:70:7A:20:44



View the WLAN Media Access Control (MAC) address of the wireless print server that is installed in the printer.

ESSID
DSF802LESS54



The Extended Service Set Identification (ESSID) is an identifier for your wireless network. This setting, which cannot be modified from the control panel, gives the ESSID for the current wireless configuration.

AP MAC ADDRESS
00:05:9A:3C:78:00



View the AP MAC address associated with the printer.

CHANNEL



View the network channel.

SIGNAL  0



View, and if necessary, change the printer's network signal.

WIRED IP ADDRESS  0.0.0.0



View, and if necessary, change the printer's wired IP address.

WIRED SUBNET MASK  255.255.255.0


View, and if necessary, change the printer's wired subnet mask.

WIRED GATEWAY  0.0.0.0



View, and if necessary, change the wired gateway setting.

WIRED IP PROTOCOL  ALL



This parameter tells if the user (permanent) or the server (dynamic) selects the IP address. If a dynamic option is chosen, this parameter tells the method(s) by which the wired or wireless server receives the IP address from the server.

WIRED MAC ADDRESS  00:07:4D:3F:D3:B2


View, and if necessary, change the printer's network signal.

IP PORT  6101


View, and if necessary, change the printer's wired IP address.

IP ALT PORT  9100


View, and if necessary, change the printer's wired subnet mask.



## BATTERY Menu

BATTERY ELIMINATOR  
INSTALLED

Indicates if a battery eliminator has been installed.



HEALTH  
GOOD

Indicates the current health of the battery, i.e. Good, Past Useful Life, etc.



CYCLE COUNT  
3

View the current cycle count of the battery.



FIRST USED  
7-12-2012


View the date on which the battery was first used in the printer.




SERIAL NUMBER  
1509

View the serial number of the battery pack.





TIMEOUT 0 SECONDS


View, and if necessary, change the battery timeout.

VOLTAGE 8.39


View the current voltage level of the battery pack.

WARNING 6.87 (176)


DTR CONTROL OFF




## LANGUAGES Menu

LANGUAGE	
▼	ENGLISH ▲
🏠	

If necessary, change the language that the printer displays.



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

COMMAND LANGUAGE	
▼	HYBRID_XML_ZPL ▲
🏠	

ZPL OVERRIDE	
DISABLED	
🏠	

Enable this menu item to allow certain ZPL commands to override the printer's current settings.

COMMAND CHAR	
^ (5E)	
🏠	

Set the format command character to match what is used in your label formats.

CONTROL CHAR	
~ (7E)	
🏠	

Set the control prefix character to match what is used in your label formats.

DELIMITER CHAR  , (2E)
🏠

Set the delimiter character to match what is used in your label formats.

ZPL MODE  ZPL II
🏠

Select the mode that matches what is used in your label formats.

VIRTUAL DEVICE  ▼ NONE ▲
🏠



## SENSORS Menu

MEDIA STATUS		
▼	OK	▲
🏠		

Informs the user of the presence or absence of media in the printer.

LABEL LENGTH CAL		
🏠		

TAKE LABEL		
▼	0	▲
🏠		



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



## PORTS Menu

BAUD RATE  19200
⬆

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

DATA BITS  8
⬆

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

PARITY  NONE
⬆

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

STOP BITS  1
⬆

Select the stop bits value that matches the one being used by the host computer.

HOST HANDSHAKE  RTS/CTS
⬆

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

HALT ON ERROR		
▼	YES	▲
🏠		

Select YES or NO to halt printing upon the occurrence of an error.



## BLUETOOTH Menu

BLUETOOTH ADDRESS  NO BLUETOOTH RADIO
🏠

View the Bluetooth address for the presence of a BT radio.

MODE  SLAVE
🏠

View the mode of the BT radio.

DISCOVERY  ON
🏠


View the discovery status, i.e. ON or OFF.

CONNECTED  NO
🏠


View the connection status of the BT radio, i.e. YES or NO.

BT SPEC VERSION  NO RADIO
🏠

View the Bluetooth spec version.

MIN SECURITY MODE
1


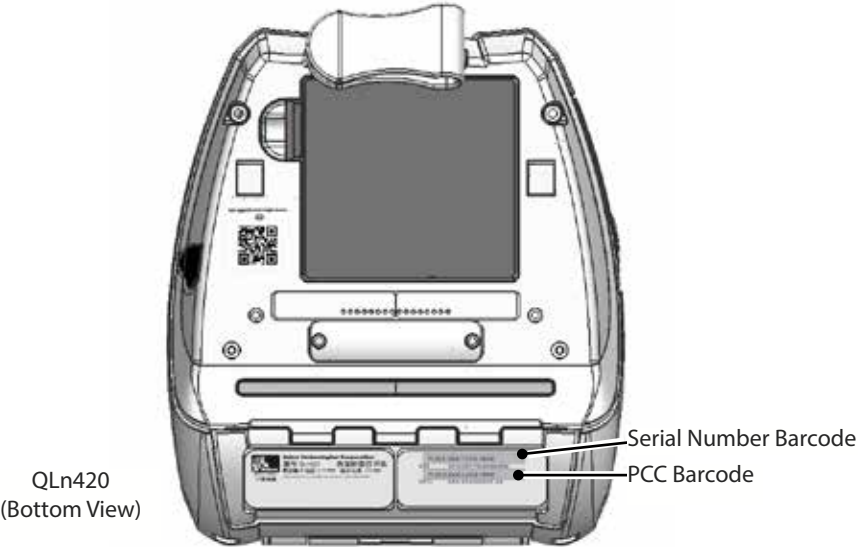
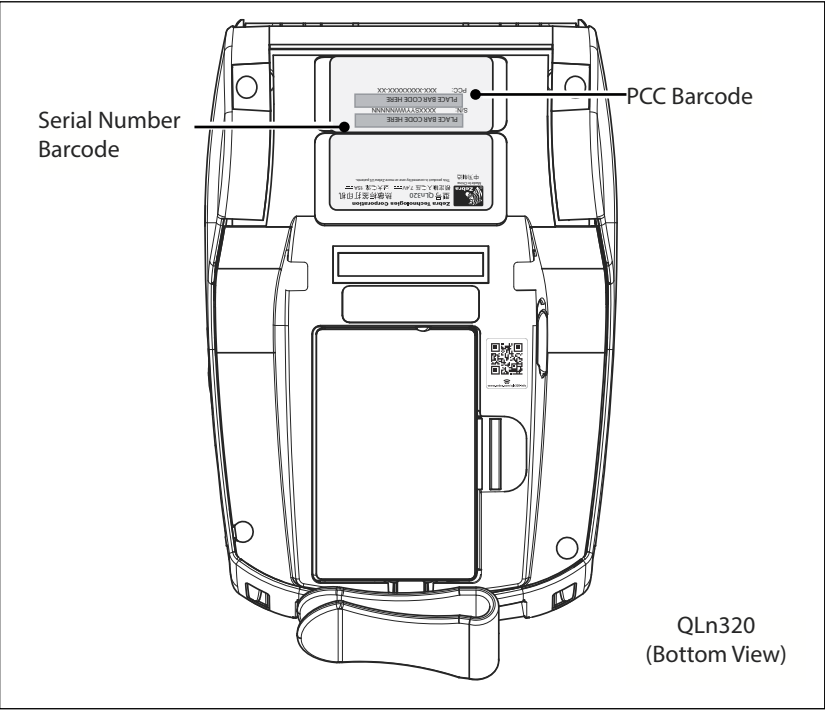
View, and change if necessary, the minimum security mode of the BT radio.

MFI CAPABILITY
PRESENT


Informs the user of the presence or availability of Made for iPhone (MFi) capability

# Appendix E

## Serial and PCC Number Locations for QLn Series Printers



## Appendix F

### Battery Disposal



The EPA certified RBRC® Battery Recycling Seal on the Lithium-Ion (Li-Ion) battery supplied with your printer indicates Zebra Technologies Corporation is voluntarily participating in an industry program to collect and recycle these

batteries at the end of their useful life, when taken out of service in the United States or Canada. The RBRC program provides a convenient alternative to placing used Li-Ion batteries into the trash or the municipal waste stream, which may be illegal in your area.



---

**Important • When the battery is depleted, insulate the terminals with tape before disposal.**

---

Please call 1-800-8-BATTERY for information on Li-Ion battery recycling and disposal bans/restrictions in your area.

Zebra Technologies Corporation's involvement in this program is part of our commitment to preserving our environment and conserving our natural resources.

Outside North America, please follow local battery recycling guidelines.

### Product Disposal



The majority of this printer's components are recyclable. Do not dispose of any printer components in unsorted municipal waste. Please dispose of the battery according to your local regulations, and recycle the other printer components according to your local standards.

For more information, please see our web site at:  
<http://www.zebra.com/environment>.

## Appendix G

### Alert Messages

The QLn Series printers will display the following alert messages to inform the user of various fault conditions that might occur with the QLn220, QLn320 and QLn420 printers.

Line One (Status)	Line Two (Action)	Notes
MEDIA OUT	LOAD MEDIA	
MEDIA COVER OPEN	CLOSE MEDIA COVER	
MAINTENANCE NEEDED	CLEAN PRINthead	
HEAD MAINTEN. NEEDED	PRINTING HALTED	
PAPER JAM	REMOVE MEDIA	
PRINthead OVERTEMP	PRINTING HALTED	
BATTERY DIMINISHED	CONSIDER REPLACING	
WARNING - BATTERY	IS PAST USEFUL LIFE	
REPLACE BATTERY	SHUTTING DOWN	
BATTERY FAILED	REPLACE BATTERY	
BATTERY LOW	CHARGE BATTERY	
CHARGING TEMP FAULT	MUST BE 0-40°C	Battery Over Temp
CHARGING TEMP FAULT	MUST BE 0-40°C	Battery Under Temp
CHARGING FAULT	REPLACE BATTERY	
DOWNLOADING	FIRMWARE	
DOWNLOAD FAILED	PLEASE REBOOT	
FIRMWARE	WRITING TO FLASH	
LOOKING FOR UPDATES	PLEASE WAIT. . .	When searching for updates
RETRIEVING FIRMWARE	DO NOT POWER OFF!	When retrieving an application
RETRIEVING NEW FILES	PLEASE WAIT. . .	When downloading files
SENDING FEEDBACK	PLEASE WAIT. . .	When sending feedback
MIRRORING COMMANDS	N/A	
MIRROR PROCESSING	FINISHED	
LOSS OF SIGNAL	MOVE IN RANGE OF AP	For 802.11 models only
SIGNAL RESTORED	N/A	For 802.11 models only



**Note •** Highlighted rows indicate Mirror Alert Messages. The mirror function is only available on units with either an 802.11 radio, Ethernet, or both.

# Appendix H

## Using Zebra.com

The following examples illustrate the search function on Zebra’s website for finding specific documents and downloads.

### Example 1: Find the QLn Series User Guide.

Go to <http://www.zebra.com/us/en/support-downloads.html>

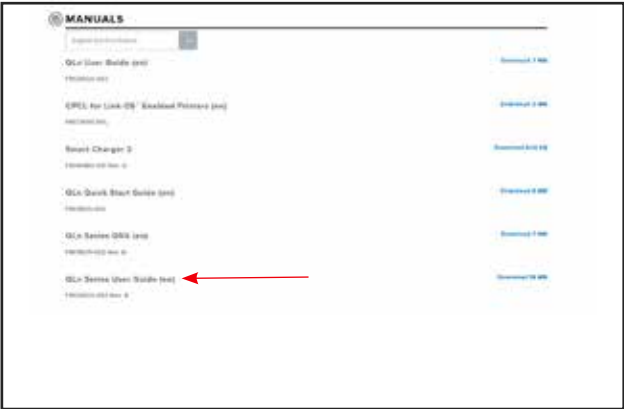
Type the appropriate printer name in search box.



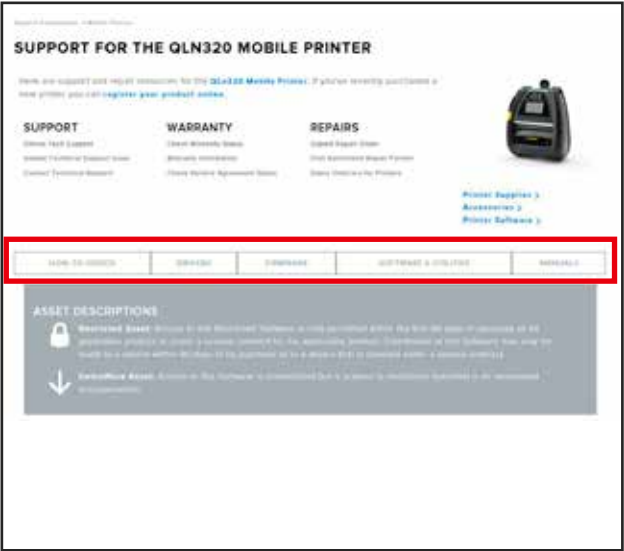
Click on the link for the desired QLn printer as indicated below.



Click on the “Manuals” tab and select QLn Series User Guide to download the manual.



To download Software, Firmware, or Drivers, click on the appropriate tab listed below and choose the necessary tools.



# Appendix I

## Product Support

When calling with a specific problem regarding your printer, please have the following information on hand:

- Model number/type (e.g. QLn320)
- Unit serial number (refer to Appendix E)
- Product Configuration Code (PCC) (refer to Appendix E)



In the Americas contact:

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