ENTERPRISE WEARABLE SOLUTION

WS501/WS501 RFID

Product Reference Guide

MN-005341-03EN Rev. A

ZEBRA

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Contents

About This Guide

This guide provides information about using the WS501/WS501 RFID wearable computer. Screens and windows pictured in this guide are samples and can differ from actual screens.

Configurations

This section details the device configurations with key specifications.

Table 1 Configurations

Form Factor	Radios	Memory	Battery	Data Capture	Operating System	Camera
Scanner	802.11 a/b/g/n/ac/ax Bluetooth 5.3 NFC	3 GB RAM/ 32 GB Flash	1300 mAh	SR560	Android Open Source Project (AOSP) 14	No
RFID Scanner	802.11 a/b/g/n/ac/ax Bluetooth 5.3 NFC	3 GB RAM/ 32 GB Flash	2400 mAh	SR560	Android Open Source Project (AOSP) 14	No
RFID Mounting Options: • Back of Hand • Wrist • Finger	802.11 a/b/g/n/ac/ax Bluetooth 5.3 NFC	3 GB RAM/ 32 GB Flash	2400 mAh	SR560	Android Open Source Project (AOSP) 14	No

Notational Conventions

The following notational conventions make the content of this document easy to navigate.

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

Icon Conventions

The documentation set is designed to give the reader more visual clues. The following visual indicators are used throughout the documentation set.

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

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

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

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

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

Service Information

If you have a problem with your equipment, contact Zebra Global Customer Support for your region. Contact information is available at: zebra.com/support.

When contacting support, please have the following information available:

- Serial number of the unit
- Model number or product name
- Software/firmware type and version number

Zebra responds to calls by email, telephone, or fax within the time limits set forth in support agreements.

If your problem cannot be solved by Zebra Customer Support, you may need to return your equipment for servicing and will be given specific directions. Zebra is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty.

If you purchased your Zebra business product from a Zebra business partner, contact that business partner for support.

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For a complete list of registered jurisdictions, please contact the NFC Forum. The NFC Forum registered N-Mark is a separate mark with a different license and terms. Please visit the NFC Forum website for additional details.

Determining Software Versions

Before contacting Customer Support, determine the current software version on your device.

1. Swipe up from the center of the screen and go to **Settings**.
2. Touch **About phone**.
3. Scroll to view the following information:

   Basic info

   - Device name
   - Battery Information
   - Emergency information

   Legal & regulatory

   - Legal information
   - SW components

   Device details

   - Model
   - Android version

   Device identifiers

   - IP address
   - Wi-Fi MAC address
   - Device Wi-Fi MAC address

- Bluetooth address
- Up time
- Build Fingerprint
- Build number

Determining the Serial Number

Before contacting Customer Support, determine the serial number of your device.

1. Touch **About phone**.
2. Touch **Model**.

Getting Started

This section provides information to get the device up and running for the first time.

Unpacking the Device

This topic provides instructions to safely unpack your device.

1. Carefully remove the device from the box.
2. Verify that the following items are in the box:
   - WS501 and 1300 mAh battery or WS501 RFID and 2400 mAh battery
   - Mounting options: finger mount, back-of-hand mount, or wrist mount
   - Regulatory Guide
3. Inspect the equipment for damage. If any equipment is missing or damaged, contact Zebra Support immediately.
4. Before using the device for the first time, remove the protective shipping films that cover the scan window, display, and camera window.

Device Features

The WS501 is a wearable computer that offers flexible hands-free operation for right or left-hand users.

The devices are available in two configurations:

- Scanner
- Scanner+RFID

Scanner Features

The Scanner is worn on the operator's index and middle fingers and utilizes a thumb-operated trigger.

Front View

Figure 1 Scanner

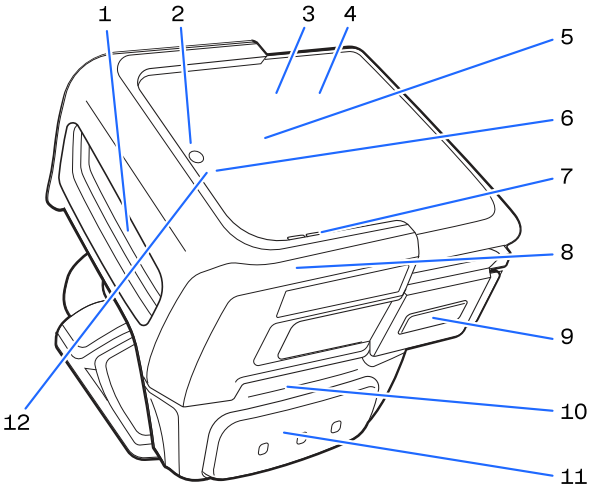
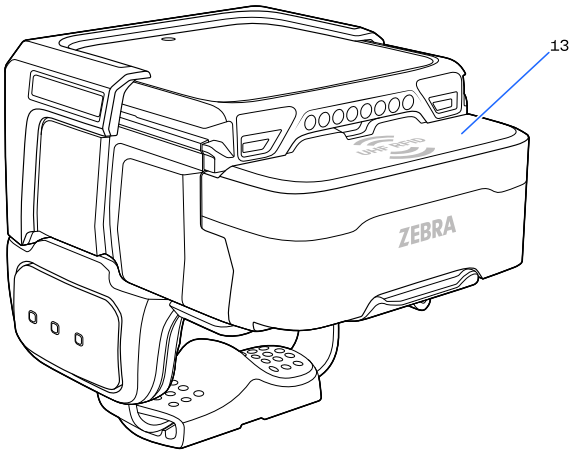


Figure 2 Scanner+RFID



Number	Item	Description
1	Scanner window	Provides data capture using the imager.
2	Microphone	Voice communications or audio recordings.
3	Display	Displays all information needed to operate the device.
4	Ambient light sensor (under the display)	Determines ambient light for controlling display backlight intensity.

Number	Item	Description
5	NFC antenna (under the display)	Provides communication with other NFC-enabled devices.
6	Charging LED	Indicates the battery charge state while charging.
7	Speaker	Voice communication or audio playback.
8	Deflector	Protects the device. **NOTE:** The deflector includes mandatory laser safety warning markings. Always fit the deflector when in use.
9	Left button	User programmable button; defaults to the **Back** button.
10	Trigger assembly	Consists of a finger strap and a scan trigger; can be removed and rotated to provide left-hand or right-hand use.
11	Scan trigger	Initiates barcode data capture when a scan-enabled application is active.
12	Notification LED	Indicates an application notification is received.
13	RFID module	Reads RFID tags.

Rear View

Figure 3 Scanner

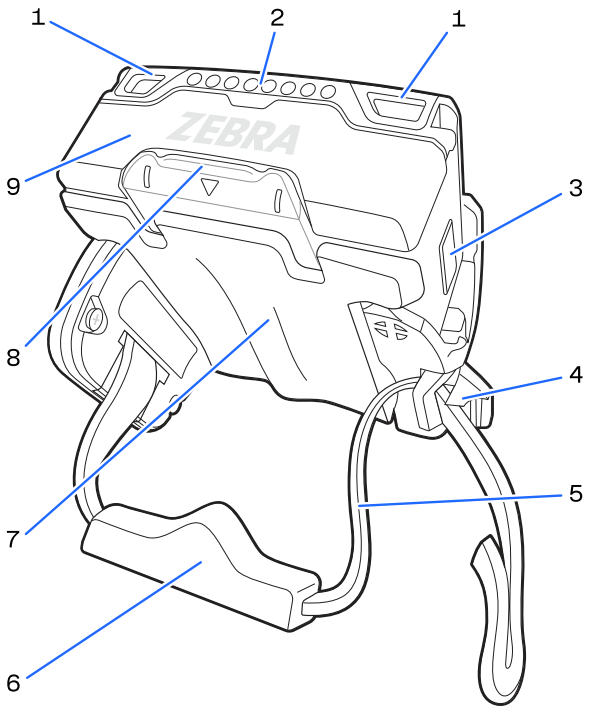
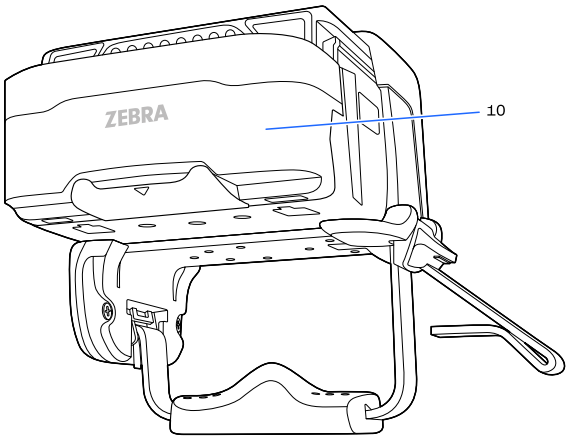


Figure 4 Scanner+RFID



Number	Item	Description
1	Scan/Custom LED	Indicates data capture and custom applications-controlled status.
2	Interface connector	Provides USB host and client communication, and device charging via cables and accessories.
3	Right button	User programmable button; defaults to the **Home** button; press to power on the device.
4	Strap buckle	Tightens or loosens the finger strap on the fingers.
5	Finger strap	Use for securely holding the device on the fingers. Comes pre-installed on every WS501 finger mount.
6	Finger wedge	Cushions and stabilizes fingers within the strap.
7	Finger comfort pad	Cushions the fingers from the device.
8	Shell release tab	Press down to release the device from the shell.
9	Battery	High capacity 1300 mAh battery powers the WS501 device, and a 2400 mAh battery powers the WS501 RFID device.
10	RFID module	Reads RFID tags.

Setting Up the Device

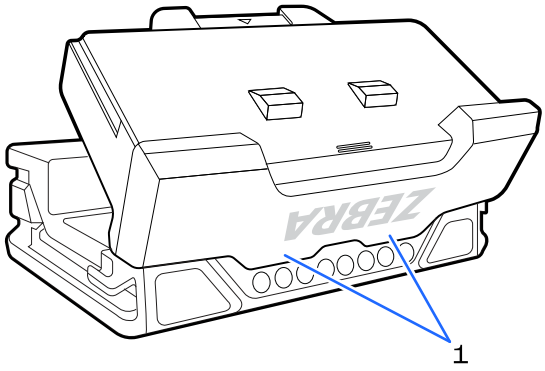
This section explains how to set up your device for a smooth and quick start.

1. Install the battery.
2. Charge the device using one of the charging accessories.
3. Power on the device.

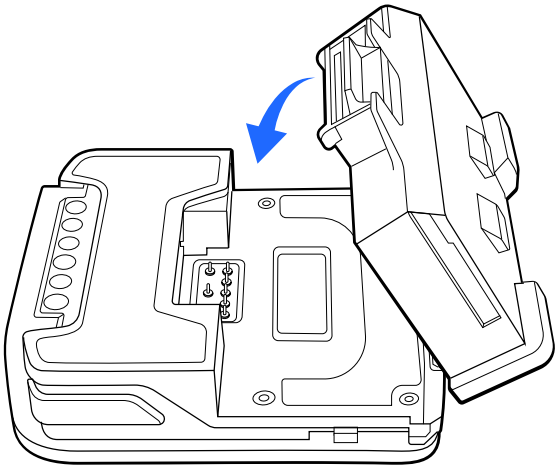
Installing the Battery in the WS501 Scanner

Install the 1300 mAh battery into the WS501 Scanner.

1. Align the battery so that the battery bottom engages the locking slots (1).



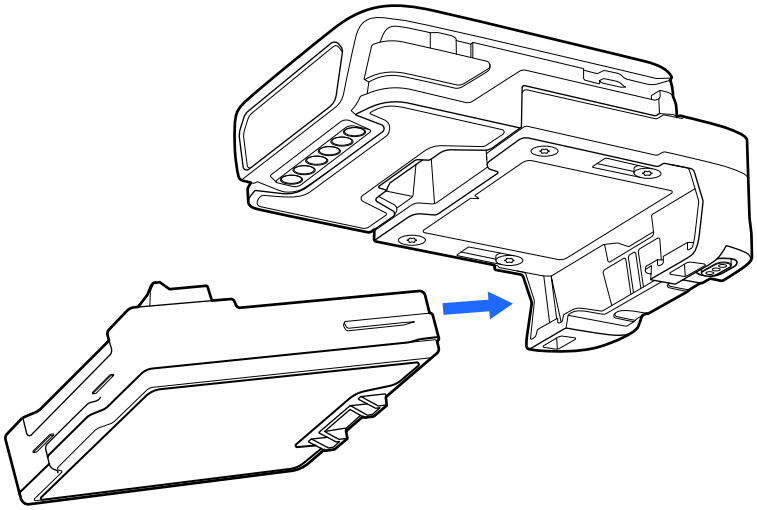
2. Press the battery down into the battery compartment until the battery release latches snap into place.



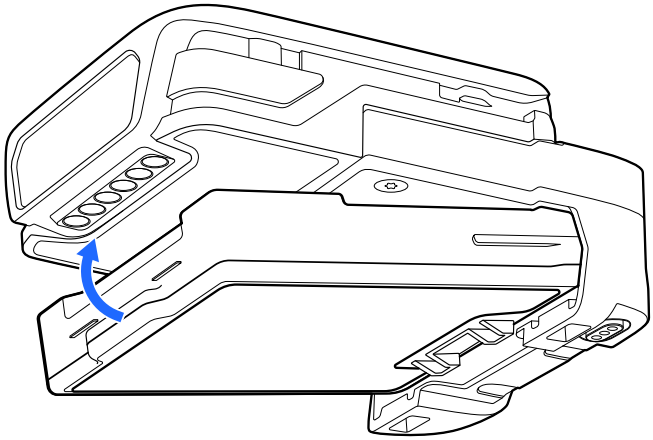
Installing the Battery in the WS501 RFID Scanner

Install the 2400 mAh battery into the WS501 RFID Scanner.

1. Align the battery so that the battery bottom engages the locking slots.



2. Press the battery into the battery compartment until it snaps into place.

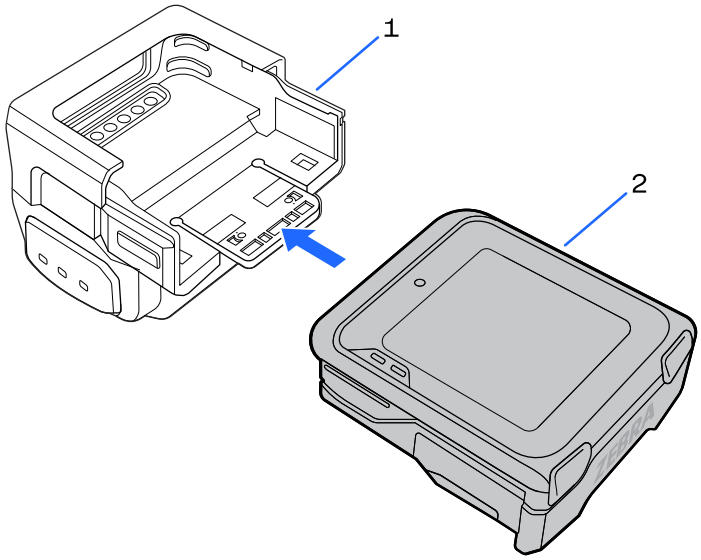


Installing the Trigger and Shell Assembly to the Scanner

Install the device to the trigger and shell assembly to utilize a thumb-operated trigger.

1. Ensure the touch panel of the device faces upward.
2. Slide the device (2) into the trigger and shell assembly (1) until the shell release latch snaps into place.

NOTE: Install the battery in the device before sliding the device into the shell.



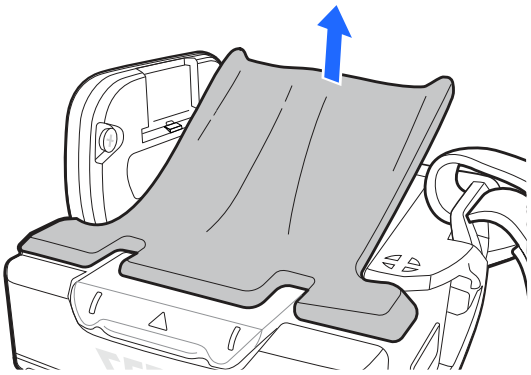
Changing the Trigger Position on the Finger Mount

The trigger assembly can be changed to accommodate left-hand or right-hand use.

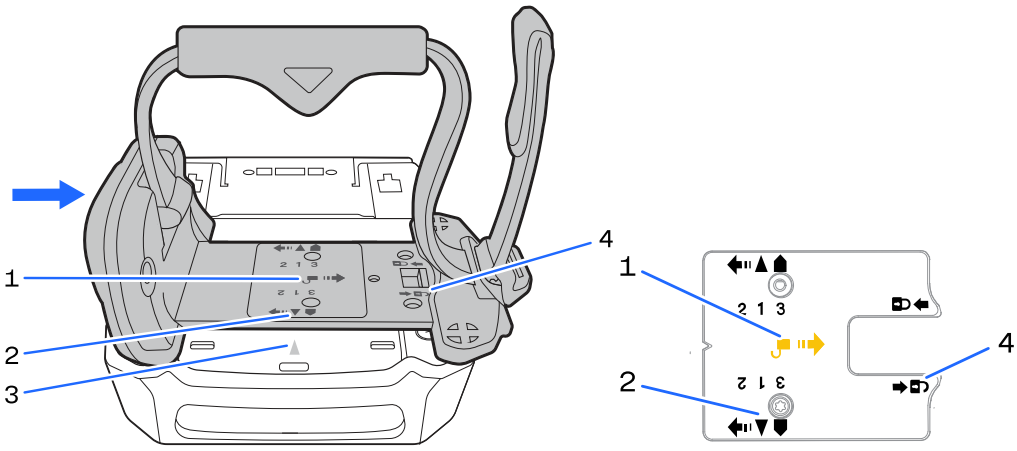
Determine whether the WS501 is used on the right or left hand so that the Scan Trigger is positioned next to the thumb.

NOTE: The described procedures are applicable to both right-handed and left-handed users. As an example, the illustrations in this section show the steps to change the trigger position from right to left.

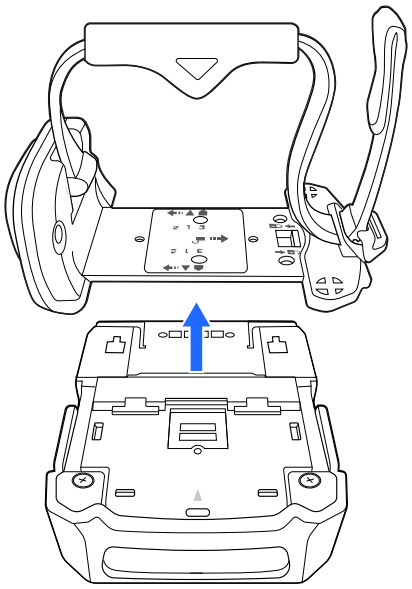
1. On the bottom of the device, lift the finger comfort pad from the front of the device, and then lift it from the rear.



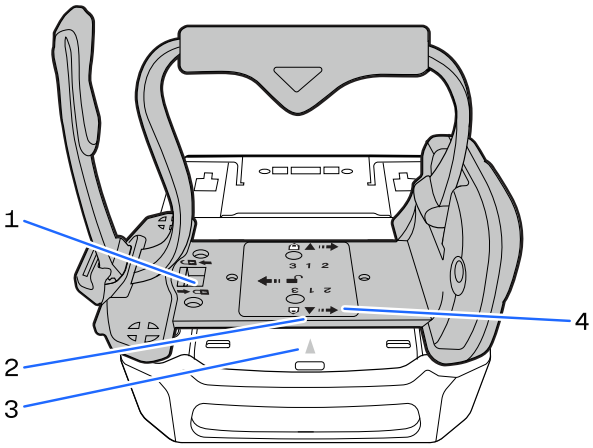
2. Follow the instructions on the back of the device to unmount the trigger assembly.
   a) Unlock the trigger assembly by pushing the release latch to Unlock (4).
   b) Slide the trigger assembly following the Unlock (1) direction until the black triangle (2) is aligned with the engraved triangle (3).



   c) Lift the trigger assembly.



3. Position the trigger assembly so that the scan trigger is positioned next to the thumb.
4. When replacing the trigger assembly onto the back of the core in the shell, ensure the black triangle (2) is aligned with the engraved triangle (3).

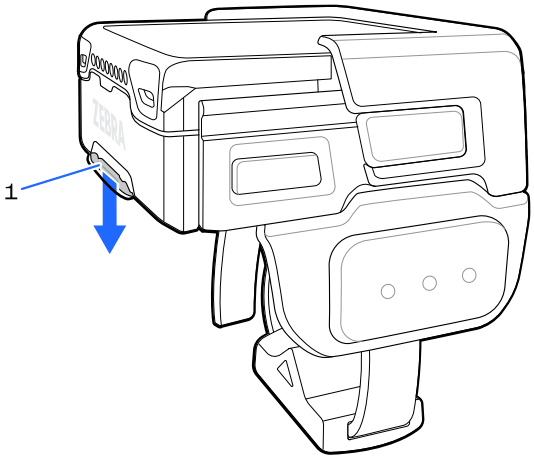


5. Slide the trigger assembly following the Lock (4) direction.
6. Lock the trigger assembly by pushing the latch to the Lock (1) position.
7. Reattach the finger comfort pad onto the bottom of the device.

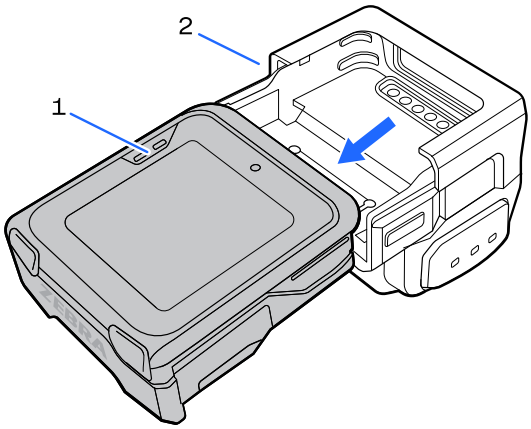
Removing the Trigger and Shell Assembly

Remove the device from the trigger and shell assembly when you need to change a battery.

1. Press down the shell release tab (1).



2. Slide the device (1) away from the trigger and shell assembly (2).



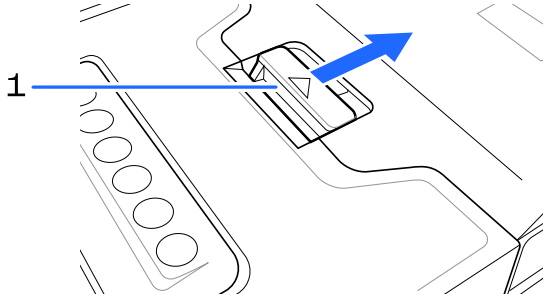
Replacing the WS501 Battery

The device supports Hot Swap mode, allowing you to replace the battery without powering off the device. When you remove the device from the shell, the display turns off and the device enters a low power state (indicated by a single red flash of the scan/custom LED). Replace the battery within two minutes to preserve memory persistence.

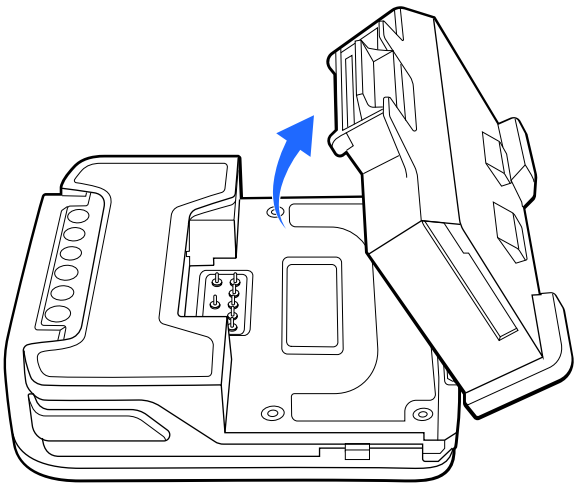
1. Remove the wearable assembly.

   For information about removing the finger trigger, go to Removing the Trigger and Shell Assembly.

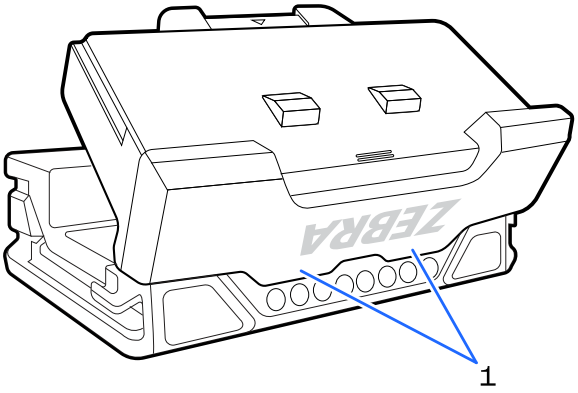
2. Rotate the device so that the touch screen is facing downward.
3. Push the battery release latch (1).



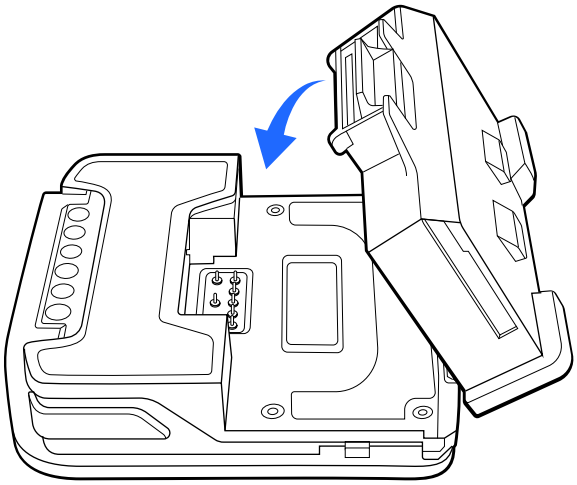
4. Lift the battery from the battery compartment.



5. Align the battery so that the battery bottom engages the locking slots (1).



6. Press the battery down into the battery compartment until the battery release latches snap into place.



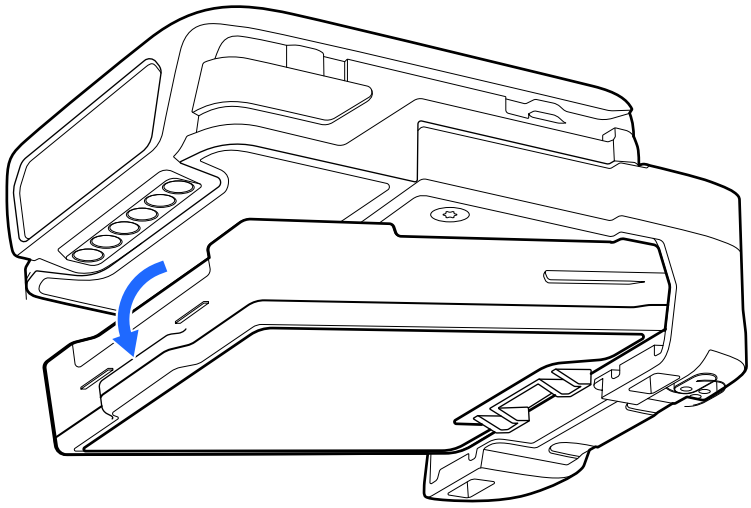
Removing the WS501 RFID Battery

This section describes how to remove the WS501 RFID battery.

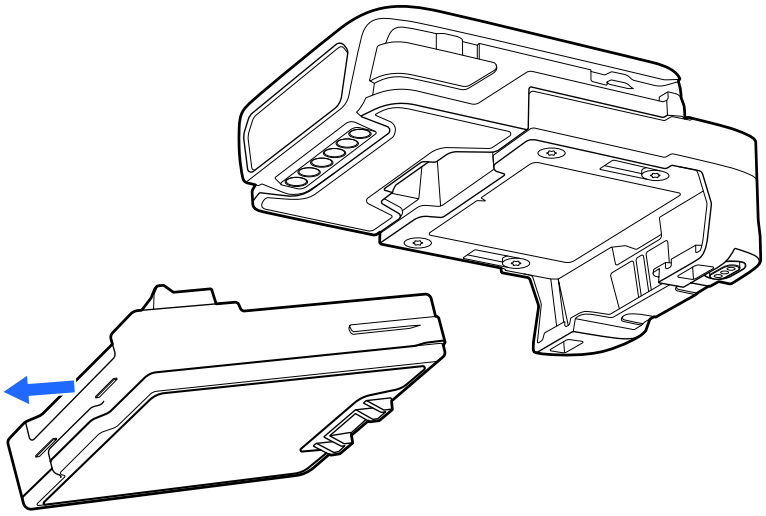
1. Remove the wearable assembly.

   For information about removing the finger trigger and wrist mount assemblies, go to Removing the Trigger and Shell Assembly.

2. Rotate the battery within the support slot.



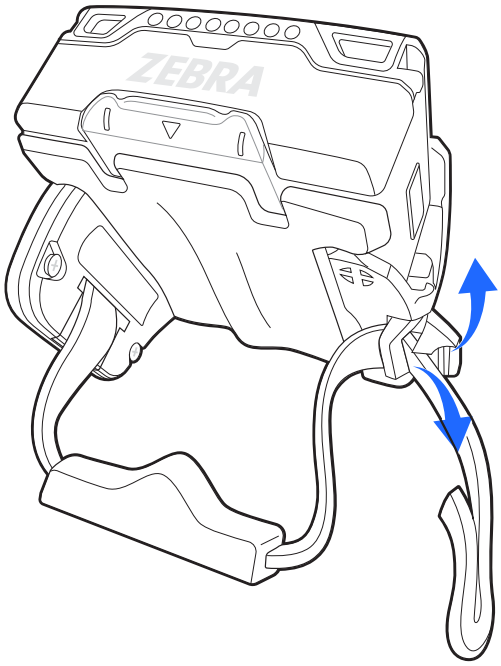
3. Lift the battery away from the battery compartment.



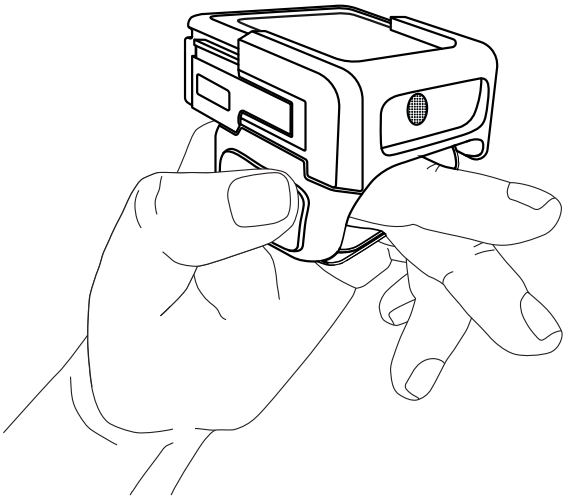
Mounting the Scanner

Wear the scanner on the index and middle fingers.

1. Slide the scanner onto the index and middle fingers with the scan trigger next to the thumb.
2. Lift the strap buckle prior to loosening or tightening the finger strap.



3. Adjust the strap through the strap buckle.



Using the Device

This section explains how to use the device.

Go Back

Swipe from the left or right edge of the screen to go back to the previous screen.

Figure 5 Swipe Left

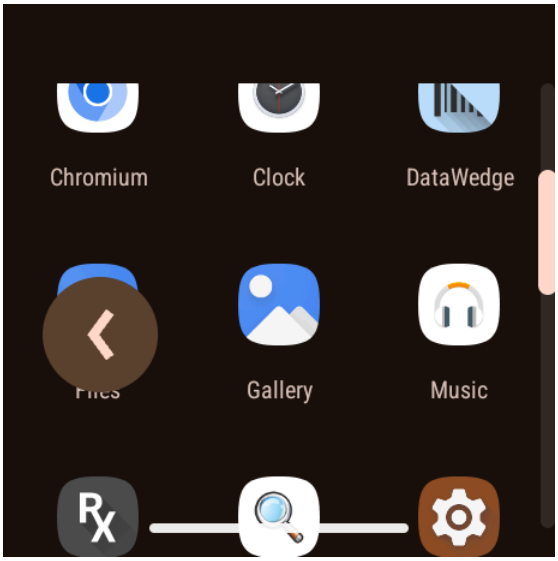
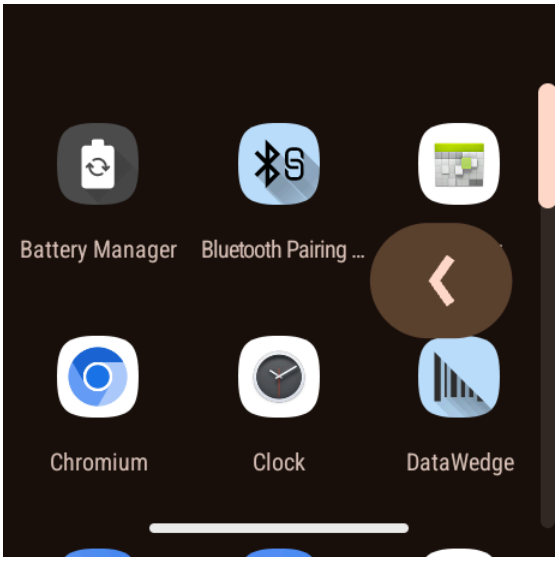


Figure 6 Swipe Right



Go to Home Screen

Swipe up from the bottom of the screen to go back to the Home Screen.

Figure 7 All Applications

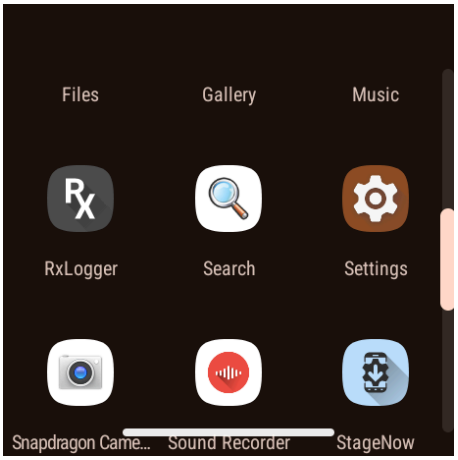
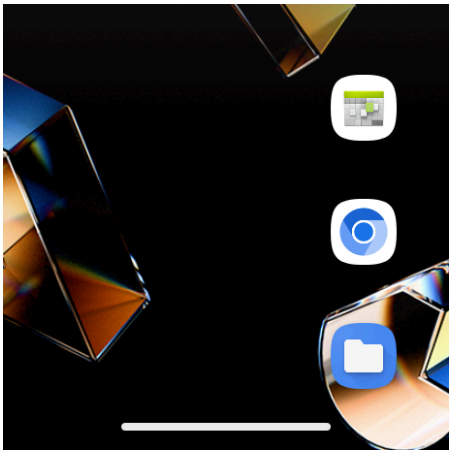


Figure 8 Home Screen



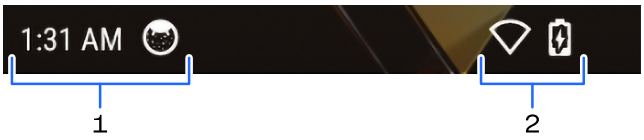
NOTE: By default, the home screen rotation is disabled.

Status Bar

The status bar displays the time, notification icons (left side), and status icons (right side).

The status bar is hidden by default. Swipe down from the top to see the status bar.

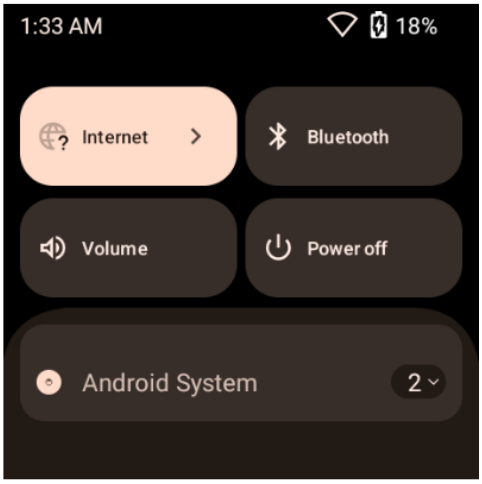
Figure 9 Notifications and Status Icons



1	Notification icons
2	Status icons

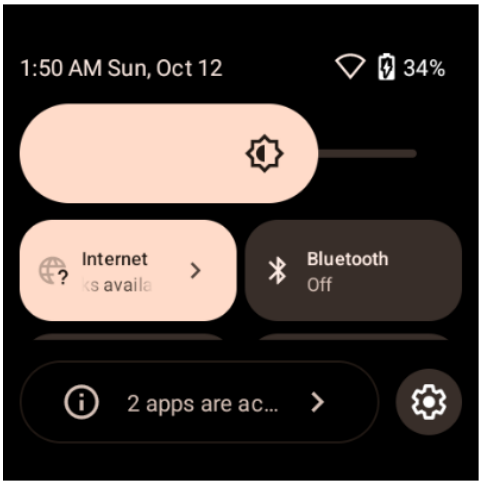
With the status bar visible, swipe down once to see the following icons.

Figure 10 Status Icons



Swipe down one more time to view the brightness slider. Swipe right to see more icons like Do Not Disturb, Alarm, Auto-rotate, Battery Saver, Screen Cast, Screen record, NFC, and Night Light.

Figure 11 Brightness Slider and Icons



Notification Icons

Notification icons indicate app events and messages.

Table 2 Notification Icons

Icon	Description
	The main battery is low.
	More notifications are available for viewing.

Table 2 Notification Icons (Continued)

Icon	Description
	Data is synching.
	Indicates an upcoming event. AOSP devices only.
	An Open Wi-Fi network is available. The device is not connected to it.
	Audio is playing.
	A problem with sign-in or sync has occurred.
	The device is uploading data.
	Animated: the device is downloading data. Static: the download is complete.
	The device is connected to or disconnected from a virtual private network (VPN).
	USB debugging is enabled on the device.
	A Bluetooth scanner is connected to the device.

Status Icons

Status icons display system information for the device.

Table 3 Status Icons

Icon	Description
	Alarm is active.
	Main battery is fully charged.
	Main battery is partially drained.
	Main battery charge is low.

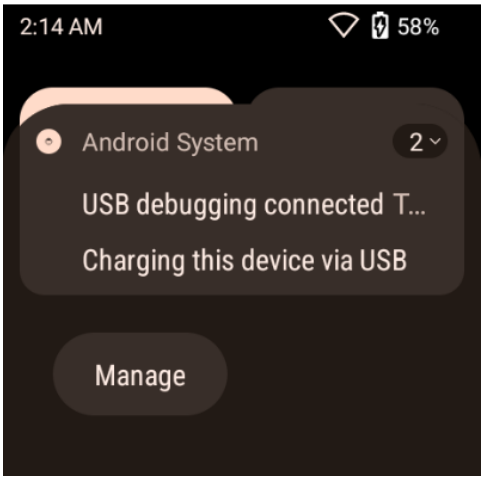
Table 3 Status Icons (Continued)

Icon	Description
	Main battery charge is very low.
	Main battery is charging.
	All sounds, except media and alarms, are muted. Vibrate mode is active.
	Do Not Disturb mode active.
	Airplane Mode is active. All radios are turned off.
	Bluetooth is on.
	Connected to a Bluetooth device.
	Connected to a Wi-Fi network. Indicates the Wi-Fi version number.
	Not connected to a Wi-Fi network or no Wi-Fi signal.
	Connected to an Ethernet network.

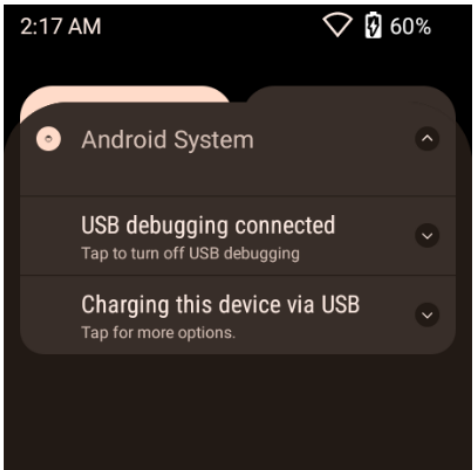
Managing Notifications

Notification icons report the arrival of new messages, calendar events, alarms, and ongoing events. When a notification occurs, an icon displays in the Status bar with a brief description.

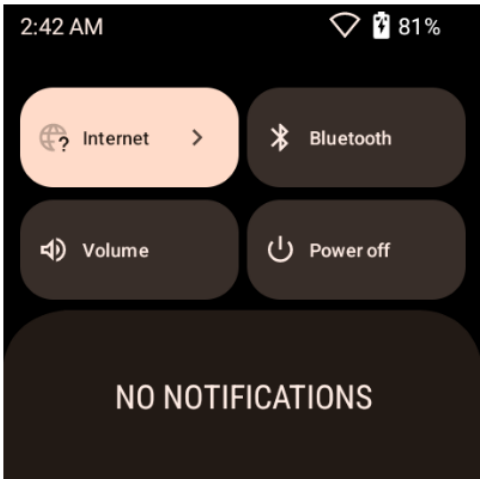
Figure 12 Notification Panel



- To view a list of all notifications, with the status bar visible, swipe down once until you see Android System. Swipe up Android System to see all the notifications.
- To respond to a notification, touch the notification number dropdown on the right to view all notifications. Select a notification to open the corresponding app.



- To manage recent or frequently used notifications, open the notification panel and then touch **Manage**. Go to **App notifications** and touch the toggle switch next to an app to turn off all notifications, or touch an app for more notification options.
- To clear all notifications, swipe either from the left or right.



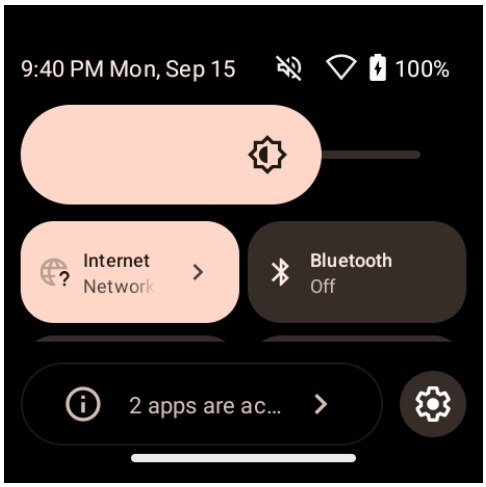
- To close the notification panel, swipe the notification panel up.

Opening the Quick Access Panel

Use the Quick Access panel to access frequently used settings (for example, Bluetooth, Screen Brightness, and so on).

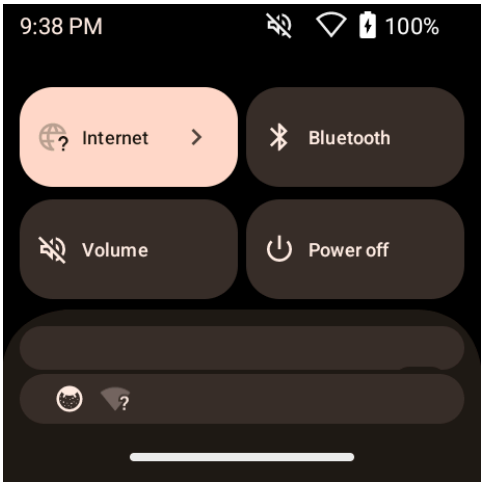
- If the device is locked, swipe down once to access the Quick Access Panel.

Figure 13 Quick Access Panel



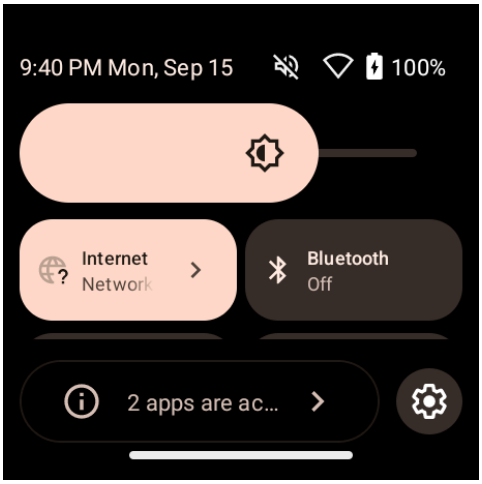
- If the device is unlocked:
  - Swipe down once until you see the Notification Panel.

Figure 14 Notification Panel



- Swipe down a second time to access the Quick Access Panel.

Figure 15 Quick Access Panel



Quick Access Panel Icons

Quick Access panel icons indicate frequently used settings (for example, Airplane mode).

Table 4 Quick Access Panel Icons

Icon	Description
	Display brightness - Use the slider to decrease or increase the brightness of the screen.
	Volume - Use the slider to decrease or increase the Media volume.

Table 4 Quick Access Panel Icons (Continued)

Icon	Description
	Power - Press to suspend device, and hold to select the following options: • **Power off** - Turn off the device. • **Restart** - Reboot the device when software stops responding.
	Internet/Wi-Fi network - Turn Wi-Fi on or off. To open Wi-Fi settings, touch the Wi-Fi network name.
	Bluetooth settings - Turn Bluetooth on or off. To open Bluetooth settings, touch Bluetooth.
	Do not disturb - Control how and when to receive notifications.
	Auto-rotate - Lock the device's orientation in portrait or landscape mode or set to automatically rotate.
	Airplane mode - Turn Airplane mode on or off. When Airplane mode is on the device does not connect to Wi-Fi or Bluetooth.
	Invert colors - Invert the display colors.
	Dark theme - Toggles dark theme on and off. Dark themes reduce the luminance emitted by the screen, while meeting minimum color contrast ratios. It helps improve visual ergonomics by reducing eye strain, adjusting brightness to current lighting conditions, and facilitating screen use in dark environments, while conserving battery power.
	Night light - Tint the screen amber to make it easier to look at the screen in dim light. Set Night Light to turn on automatically from sunset to sunrise, or at other times.
	Screen record - Makes a video recording of everything that happens on the screen, with options to include audio and screen touches.

Editing Icons on the Quick Settings Panel

Manage and arrange icons within the Quick Settings Panel.

- Swipe down twice from the top of the screen until you see the brightness slider.
- Swipe up from the middle of the screen and touch  to edit, add, or remove settings tiles.

Battery Management

Observe the recommended battery optimization tips for the device.

- The screen timeout is set to 15 seconds to automatically turn the screen off during inactivity.
- Set the screen to turn off after a short period of inactivity.
- Reduce screen brightness.

- Turn off all wireless radios when not in use.
- Turn off automatic syncing for Email, Calendar, Contacts, and other apps.
- Minimize the use of apps that keep the device from sleeping, for example, music and video apps.

NOTE: Before checking the battery charge level, remove the device from any AC power source (cradle or cable).

Low Battery Notification

When the battery charge level drops below the charge level in the table below, the device displays a notice to connect the device to power. Charge the battery using one of the charging accessories.

Charge Level Drops Below	Action
20%	The device displays a notice to connect the device to power. The user should charge the battery using one of the charging accessories.
10%	The device displays a notice to connect the device to power. The user must charge the battery using one of the charging accessories.
4%	The device turns off. The user must charge the battery using one of the charging accessories.

NOTE: The RFID reader will not operate when the battery drops down to 10%.

Monitoring Battery Usage

The Battery screen provides battery charge details and power management options to extend battery life. Different apps display different information. Some apps include buttons that open screens with settings to adjust power use.

1. Go to **Settings**.
2. Touch **Battery**.

To display battery information and power management options for a specific app:

3. Go to **Settings**.
4. Touch **Apps**.
5. Touch **See all apps**.
6. Touch an app.
7. Touch **App battery usage**.

Interactive Sensor Technology

To take advantage of these sensors, applications use API commands. Refer to the Google Android Sensor APIs for more information. For information on the Zebra Android EMDK, go to: techdocs.zebra.com.

The device contains sensors that monitor movement, orientation, and ambient light.

- Gyroscope - Measures angular rotational velocity to detect rotation of the device.

- Accelerometer - Measures the linear acceleration of movement to detect the orientation of the device.
- Light Sensor - Detects ambient light and adjusts the screen brightness.

Waking the Device

The device goes into Sleep mode after a period of inactivity (set in the Display settings window).

- To wake the device from Sleep mode, press any button on the device or double-tap on the screen.

  The Home screen displays.
- If screen lock is used, swipe the screen up to unlock.
  - If the screen option is set to Swipe, the Home screen displays.
  - If either the PIN or Password screen unlock feature is enabled, a prompt displays. Enter the PIN or password to unlock the device and move to the Home screen.
  - If the Pattern screen unlock feature is enabled, the Pattern screen displays. Swipe the correct pattern between the dots to unlock the device and move to the Home screen.

NOTE: If you enter the PIN, password, or pattern incorrectly five times, you must wait 30 seconds before trying again.

USB Communication

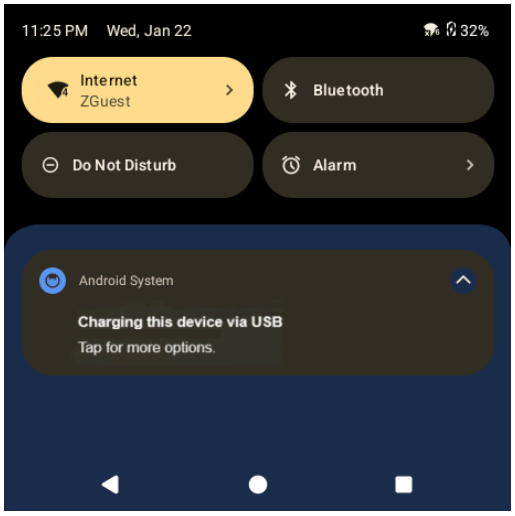
Connect the device to a host computer to transfer files between the device and the host computer.

When connecting the device to a host computer, follow the host computer's instructions for connecting and disconnecting USB devices to avoid damaging or corrupting files.

Transferring Files

Use the Transfer files option to copy files between the device and the host computer.

1. Connect the device to a host computer using a USB accessory.
2. On the device, pull down the Notification panel and touch **Charging this device via USB**.



By default, **No data transfer** is selected.

3. Touch **File Transfer**.
4. On the host computer, open **File Explorer**.
5. Locate the **device** as a portable device.
6. Open the **Internal storage** folder.
7. Copy files to and from the device or delete files as required.

Transferring Photos

Use PTP to copy photos from the device to the host computer.

1. Connect the device to a host computer using a USB accessory.
2. On the device, pull down the Notification panel and touch **Charging this device via USB**.
3. Touch **PTP**.
4. On the host computer, open a file explorer application.
5. Open the **Internal storage** folder.
6. Copy or delete photos as required.

Disconnecting from the Host Computer

CAUTION: Carefully follow the host computer's instructions to disconnect USB devices correctly to avoid losing information.

1. On the host computer, unmount the device.
2. Remove the device from the USB accessory.

Settings

This section describes the settings on the device.

Accessing Settings

To access settings on the device:

- Touch **Settings** in the APPS menu.

Display Settings

Use Display Settings to change the screen brightness, enable night light, change the background image, enable screen rotation, set screen timeout, enable dark theme, and change font size.

Setting the Screen Brightness Manually

Manually set the screen brightness using the touchscreen.

1. With the status bar visible, swipe down twice from the top of the screen to view the brightness slider.
2. Slide the icon to adjust the screen brightness level.

Setting the Screen Brightness Automatically

Automatically adjust the screen brightness using the built-in light sensor.

1. Go to **Settings**.
2. Touch **Display**.
3. If disabled, touch **Adaptive brightness** to automatically adjust the brightness.

   By default, **Adaptive brightness** is disabled. Toggle the switch to enable.

Setting Night Light

The Night Light setting tints the screen amber, making the screen easier to look at in low light.

1. Go to **Settings**.
2. Touch **Display**.
3. Touch **Night Light**.
4. Touch **Schedule**.
5. Select one of the schedule values:
   - **None** (default)
   - **Turns on at custom time**
6. By default, **Night Light** is disabled. Touch **Use Night Light** to enable.
7. Adjust the tint using the **Intensity** slider.

Setting Screen Timeout

The screen turns off and goes into Suspend mode after the selected period of inactivity.

1. Go to **Settings**.
2. Touch **Display** > **Screen timeout**.
3. Select one of the sleep values:
   - **1 minute**
   - **2 minutes**
   - **5 minutes**
   - **10 minutes**
   - **30 minutes**

Setting Screen Rotation

By default, the screen rotation is enabled.

1. Go to **Settings**.
2. Touch **Display**.
3. Touch **Auto-rotate screen**.

Setting Lock Screen Notifications

The lock screen display setting wakes the screen when notifications are received.

1. Go to **Settings**.
2. Touch **Display** > **Lock Display**.

Setting Dark Theme

The Dark Theme setting reduces the light emitted by the device, making the screen easier to read.

1. Go to **Settings**.
2. Touch **Display**.
3. Touch **Dark theme**.

Setting Font and Display Size

Set the size of the font and display in system apps.

1. Go to **Settings**.
2. Touch **Display**.
3. Touch **Display size and text**.
4. Use the size **+** and **-** slider to vary the size of the font and the display accordingly.

Setting Touch Panel Mode

The display is able to detect touches using a finger or a gloved finger.

NOTE: A glove can be made of medical latex, leather, cotton, or wool. The device supports light to medium weight gloves, and may not detect touches from heavy outdoor gloves.

1. Go to **Settings**.
2. Touch **Display**.
3. Touch **Touch panel mode**.
4. Select:
   - **Finger Only** to use a finger (no gloves) on the screen.
   - **Glove and Finger (Screen Protector OFF)** to use a finger or a gloved finger on the screen without a screen protector.
   - **Finger Only (Screen Protector ON)** to use a finger on the screen without a screen protector.
   - **Glove and Finger (Screen Protector ON)** to use a finger or a gloved finger on the screen with a screen protector.

Setting the Date and Time

You are only required to set the time zone or set the date and time if the wireless LAN does not support Network Time Protocol (NTP) or when not connected to a cellular/wireless network.

1. Go to **Settings**.
2. Touch **System** > **Date & time**.
3. Touch **Set time automatically** to disable automatic date and time synchronization.
4. Touch **Date** to select the date in the calendar.
5. Touch **OK**.

6. Touch **Time**.
   a) Select current hour.
   b) Select current minute.
   c) Touch **AM** or **PM**.
7. Touch **OK**.
8. Touch **Time zone** to select the current time zone from the list.
9. Touch **Update Interval** to select an interval to synchronize the system time from the network.
10. Under Time Format, choose either **Use locale default** or **Use 24-hour format**.

General Sound Setting

Press the volume buttons on the device to display on-screen volume controls.

Use the Sound settings to configure media and alarm volumes.

1. Go to **Settings**.
2. Touch **Sound & vibration**.
3. Touch an option to set sounds.

Sound Options

The Sound Options menu allows users to customize and manage their device's audio and vibration settings to suit their preferences.

- **Zebra volume controls:**
  - **Media volume** - Controls the music, games, and media volume.
  - **Call volume** - Controls the volume during a call.
  - **Ring volume** - Controls the ringtone volume.
  - **Notification volume** - Controls the notification volume.
  - **Alarm volume** - Controls the alarm clock volume.
  - **Do Not Disturb** - Mutes some or all sounds and vibrations.
  - **Media** - Shows the media player in Quick Settings while sound is playing, allowing quick access.
  - **Vibration & haptics:**
    - **Default notification sound** - Select a sound to play for all system notifications.
    - **Default alarm sound** - Select a sound to play for alarms.
    - **Screen locking sound** - Play a sound when locking and unlocking the screen (default - enabled).
    - **Charging sounds and vibration** - Play a sound and vibrate when power is applied to the device (default - disabled).
    - **Tap & click sounds** - Play a sound when interacting with the screen (default - enabled).
    - **Always show icon when in vibrate mode** - Enable the vibrate mode status bar icon.

Wake-Up Sources

By default, the device wakes from suspend mode when you press any physical button or trigger on the device.

To configure the wake-up button, go to WS50 TechDocs. The functionality described is applicable to both the WS50 and WS501.

Button Remapping

Buttons on the device can be programmed to perform different functions or as shortcuts to installed apps. For a list of key names and descriptions, go to: WS50 TechDocs.

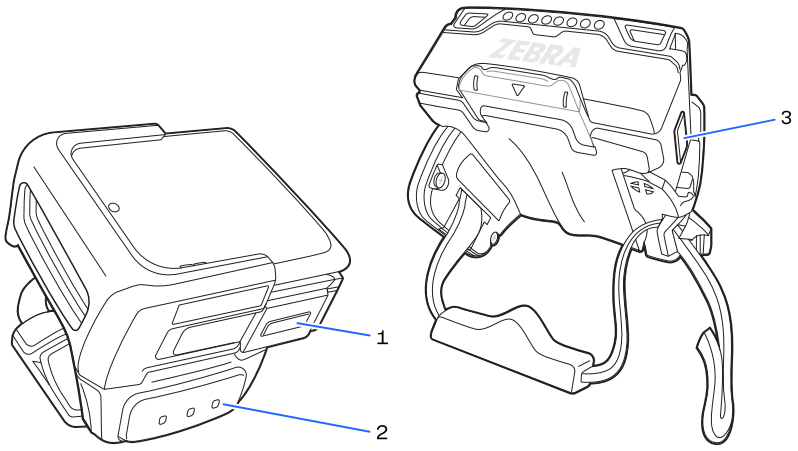
NOTE: The Push-to-Talk button was moved to a more ergonomic position to optimize the efficiency of voice-centric use cases in Workcloud Communications.

Remappable Keys

Use Key Mapping Manager to program the buttons on the device to perform a different function.

For more information, go to the Key Remapping section in the WS501 Programmer's Guide at techdocs.zebra.com/ws50/. The functionality described is applicable to both the WS50 and WS501.

Figure 16 Scanner Key Positions



1	Left	Back
2	L1	Button L1 (scan)
3	Right	Home

Keyboards

The device provides multiple keyboard options.

- Scrolling Keyboard
- Physical Keyboard

Enabling Keyboards

By default, the **Scrolling Keyboard** is enabled.

1. Go to **Settings**.
2. Touch **System** > **Languages & input** > **On-screen keyboard**.
3. Touch a keyboard to enable.

Using the Scrolling Keyboard

Use the Scrolling Keyboard to enter text in a text field.

Edit Text

Edit entered text and use menu commands to cut, copy, and paste text within or across apps. Some apps do not support editing some or all of the text they display; others may offer their own way to select text.

Entering Numbers, Symbols, and Special Characters

You can enter numbers, symbols, and special characters using the Scrolling Keyboard.

- Enter numbers and symbols.
  - Touch the **Shift** key once for a single capital letter. Touch the **Shift** key twice to lock in uppercase. Touch the **Shift** key a third time to unlock Capslock.
  - Touch **?123** to switch to the numbers and symbols keyboard.
  - Touch the **~\^** key on the numbers and symbols keyboard to view additional symbols.

Language Usage

Use the **Language & input** settings to change the device's language, including words added to the dictionary.

Changing the Language Setting

1. Go to **Settings**.
2. Touch **System** > **Languages & input**.
3. Touch **Languages**.

   A list of available languages displays.
4. If the desired language is not listed, touch **Add a language** and select a language from the list.
5. Touch and hold ☰ to the right of the desired language, then drag it to the top of the list.

   The operating system text changes to the selected language.

Notifications

Device notification settings allow you to configure how notifications occur on the device, and app notification settings allow you to configure how notifications for a specific app occur.

To view device notification settings, touch **Settings** > **Notifications** > **Device & app notifications**.

To view app notifications, touch **Settings** > **Notifications** > **App notifications**, and then select an app.

Applications

The APPS screen displays icons for all installed apps. Go to Application Deployment for information on installing and uninstalling apps. For information on standard Android apps, refer to the Google Play Store (https://play.google.com/store/apps).

Installed Applications

Aside from the common Google apps, the Zebra-specific apps that are installed on the device are described in this section.

NOTE: To ensure the stable operation of the device, the recommended maximum memory utilization for the device should be kept below 350 MB for total user applications. This includes Enterprise Mobility Management (EMM).

Table 5 Apps

Icon	Description
	**Battery Manager** - Display battery information, including charge level, status, health and wear level.
	**Bluetooth Pairing Utility** - Use to pair peripherals with the device by scanning a barcode.
	**DataWedge** - Enables data capture using the imager.
	**RxLogger** - Use to diagnose device and app issues.
	**StageNow** - Allows the device to stage a device for initial use by initiating the deployment of settings, firmware, and software.
	**Zebra Bluetooth** - Use to configure Bluetooth logging.

Table 5 Apps (Continued)

Icon	Description
	**Zebra Data Services** - Use to enable or disable Zebra Data Services. Some options are set by the system administrator.

Accessing Apps

Swipe up from the center (1) of the screen to see all installed applications.

Figure 17 Home Screen

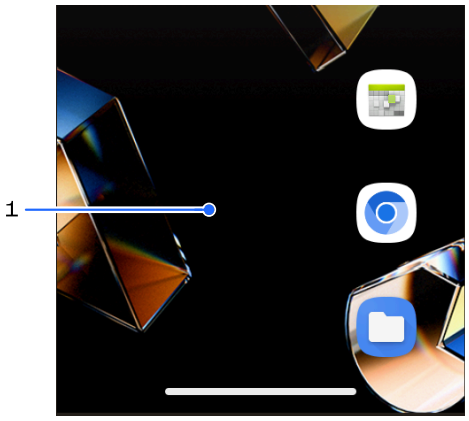
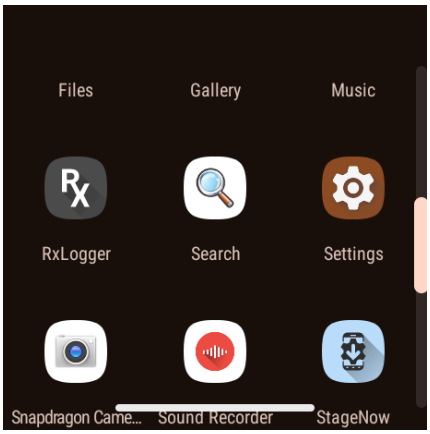


Figure 18 All Applications



Battery Manager

The Battery Manager provides detailed information about the battery.

Opening Battery Manager

- Swipe up from the middle of the screen to view all applications.

Battery Manager Information

The Battery Manager displays detailed information about battery charging, health, and status.

Table 6 Battery Icons

Battery Icon	Description
	Battery charge level is between 85% and 100%.
	Battery charge level is between 19% and 84%.
	Battery charge level is between 0% and 18%.

- **Level** - The current battery charge level as a percentage. Displays -% when the level is unknown.
- **Wear** - The health of the battery in graphical form. When the wear level exceeds 80%, the bar color changes to red.
- **Health** - The health of the battery. If a critical error occurs, displays. Touch to view the error description.
  - **Decommission** - The battery is past its useful life and should be replaced. Contact the system administrator.
  - **Good** - The battery is good.
  - **Charge error** - An error occurred while charging. Contact the system administrator.
  - **Over Current** - An over-current condition occurred. Contact the system administrator.
  - **Dead** - The battery has no charge. Replace the battery.
  - **Over Voltage** - An over-voltage condition occurred. Contact the system administrator.
  - **Below Temperature** - The battery temperature is below the operating temperature. Contact the system administrator.
  - **Failure Detected** - A failure has been detected in the battery. Contact the system administrator.
  - **Unknown** - Contact the system administrator.
- **Charge Status**
  - **Not charging** - The device is not connected to AC power.
  - **Not charging** - The device is not charging.
  - **Charging-AC** - The device is connected to AC power and charging or is fast charging via USB.
  - **Charging-USB** - The device is connected to a host computer with a USB cable and charging.
  - **Discharging** - The battery is discharging.
  - **Full** - The battery is fully charged.

    - **Unknown** - The battery status is unknown.
- **Battery present status** - Indicates that the battery is present.
- **Battery scale** - The battery scale level used to determine battery level (100).
- **Battery level** - The battery charge level as a percentage of scale.
- **Battery voltage** - The current battery voltage in millivolts.
- **Battery temperature** - The current battery temperature in degrees Celsius.
- **Battery technology** - The type of battery.
- **Battery current** - The average current into or out of the battery over the last second in mAh.
- **Battery manufacture date** - The date of manufacture.
- **Battery serial number** - The battery serial number. The number matches the serial number printed on the battery label.
- **Battery part number** - The battery part number.
- **Battery decommission status** - Indicates if the battery is past its life span.
    - **Battery Good** - The battery is in good health.
    - **Decommissioned Battery** - The battery is past its useful life and should be replaced.
- **Base cumulative charge** - Cumulative charge using Zebra charging equipment only.
- **Battery usage number** - The health of the battery as a result of charging and discharging. A high number indicates low battery health.
- **Usage decommission threshold** - When the Battery usage number is greater than or equal to the Usage decommission threshold, the battery is past its useful life and should be replaced.
- **Battery error status** - The error status of the battery.
- **App version** - The application version number.

RxLogger

RxLogger is a comprehensive diagnostic tool that provides application and system metrics, and diagnoses device and application issues.

RxLogger logs the following information: CPU load, memory load, memory snapshots, battery consumption, power states, wireless logging, TCP dumps, Bluetooth logging, logcat, FTP push/pull, ANR dumps, and so on. All generated logs and files are saved onto flash storage on the device (internal or external).

RxLogger Configuration

RxLogger is built with an extensible plug-in architecture and comes packaged with a number of plug-ins already built-in. For information on configuring RxLogger, go to techdocs.zebra.com/rxlogger/.

To open the configuration screen, from the RxLogger home screen, touch **Settings**.

Configuration File

All RxLogger settings are stored in a file on the device, permitting remote configuration and mass deployment of setting files using an enterprise mobile management (EMM) system.

The config.json configuration file is located in the RxLogger\config folder. Copy the file from the device to a host computer using a USB connection. Edit the configuration file and then replace the JSON file on the device. There is no need to stop and restart the RxLogger service because the file change is automatically detected.

Enabling Logging

1. Swipe up from the middle of the screen to view all applications.
2. Select  .
3. Touch **Start**.

Disabling Logging

1. Swipe up from the middle of the screen to view all applications.
2. Select  .
3. Touch **Stop**.

Extracting Log Files

This section describes the method for extracting log files.

1. Connect the device to a host computer using a USB connection.
2. Using a file explorer, navigate to the RxLogger folder.
3. Copy the file from the device to the host computer.
4. Disconnect the device from the host computer.

Backing Up Data

RxLogger Utility allows the user to make a zip file of the RxLogger folder in the device, which by default contains all the RxLogger logs stored in the device.

- To save the backup data, touch ⋮ > **BackupNow**.

Data Capture

This section provides information for capturing barcode data using various scanning options.

The device supports data capture using:

- Integrated SR560-Standard Range Imager
- RFID (Radio Frequency Identification)

Imaging

The device with an integrated 2D imager has the following features:

- Omnidirectional reading of a variety of barcode symbologies, including the most popular linear, postal, PDF417, Digimarc, and 2D matrix code types.
- The ability to capture and download images to a host for a variety of imaging applications.
- Advanced intuitive laser aiming cross-hair and dot aiming for easy point-and-shoot operation.

The imager uses imaging technology to take a picture of a barcode, stores the resulting image in memory, and executes state-of-the-art software decoding algorithms to extract the barcode data from the image.

Operational Modes

The device with an integrated imager supports three modes of operation.

Activate each mode by pressing **Scan**.

- Decode mode — The device attempts to locate and decode enabled barcodes within its field of view. The imager remains in this mode as long as you hold the scan button, or until it decodes a barcode.
- Picklist mode — Selectively decode a barcode when more than one barcode is in the device's field of view by moving the aiming crosshair or dot over the required barcode. Use this feature for pick lists containing multiple barcodes and manufacturing or transport labels containing more than one barcode type (either 1D or 2D).

Scanning Considerations

Typically, scanning is a simple matter of aim, scan, and decode, with a few quick trial efforts to master it.

However, consider the following to optimize scanning performance:

- Range — Scanners decode optimally over a particular working range — minimum and maximum distances from the barcode. This range varies according to barcode density and scanning device optics. Scan within range for quick and constant decodes; scanning too close or too far away prevents decodes. Move the scanner closer and further away to find the right working range for the barcodes being scanned.
- Angle — Scanning angle is important for quick decodes. When the illumination/flash reflects directly back into the imager, the specular reflection can blind/saturate the imager. To avoid this, scan the barcode so that the beam does not bounce directly back. Do not scan at too sharp an angle; the scanner needs to collect scattered reflections from the scan to make a successful decode. Practice quickly shows what tolerances to work within.
- Hold the device farther away for larger symbols.
- Move the device closer for symbols with bars that are close together.

NOTE: Scanning procedures depend on the app and device configuration. An app may use different scanning procedures from the one listed above.

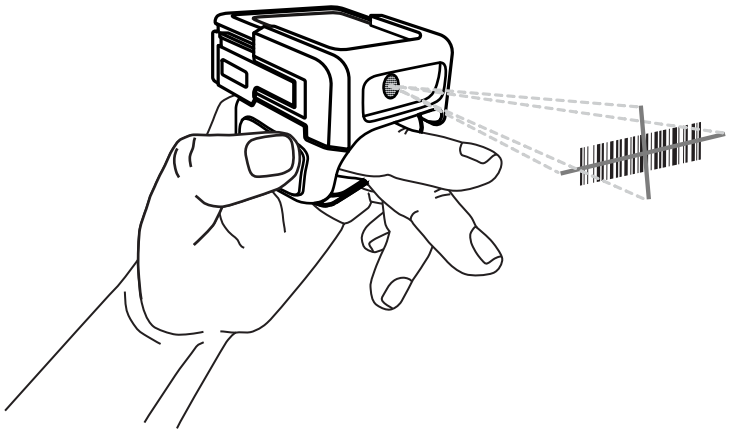
Scanning with the Internal Imager

Use the internal imager to capture barcode data.

NOTE: Imager decoding usually occurs instantaneously. The device repeats the steps required to take a digital picture (image) of a poor or difficult barcode as long as the scan button remains pressed.

To scan with the internal imager:

1. Ensure that an application is open on the device and a text field is in focus (text cursor in text field).
2. Point the exit window of the device at a barcode.

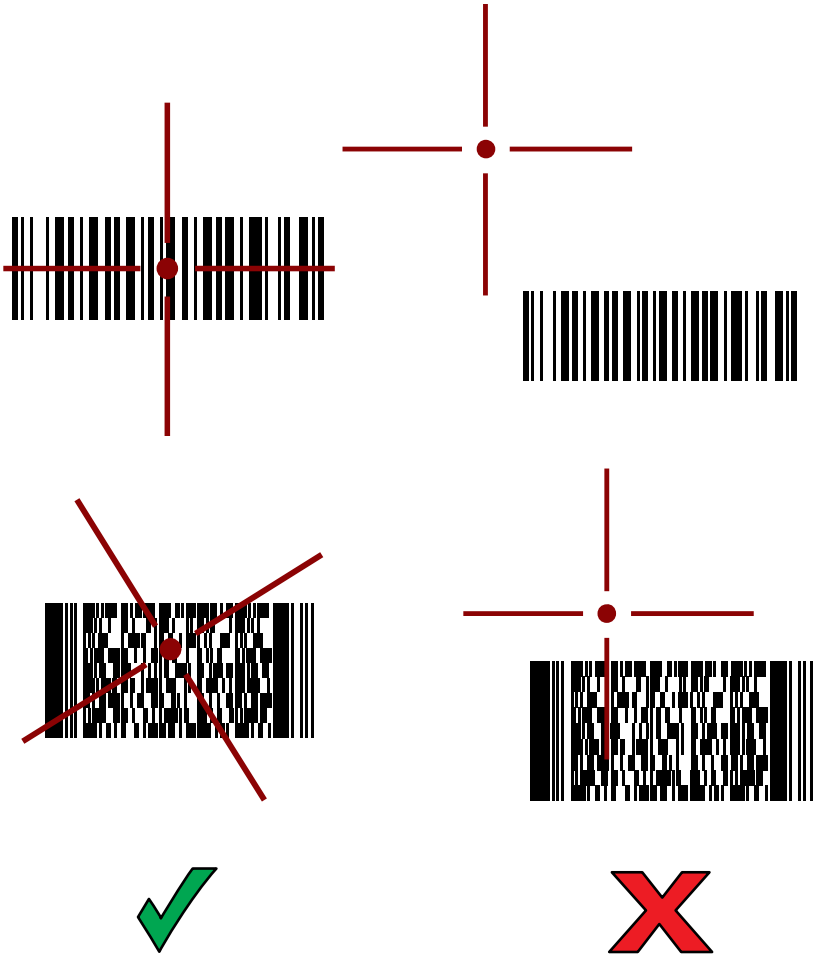


3. Press and hold the scan button.

   The red laser aiming pattern turns on to assist in aiming.

4. Ensure the barcode is within the area formed by aiming pattern.

Figure 19 Aiming Pattern: Standard Range



The Scan/Custom LED light green and a beep sounds, by default, to indicate the barcode was decoded successfully.

5. Release the scan button

The barcode content data displays in the text field.

DataWedge

DataWedge is a utility that adds advanced barcode scanning capability to any application without writing code. It runs in the background and handles the interface to built-in barcode scanners. The captured barcode data is converted to keystrokes and sent to the target application as if it was typed on the keypad.

DataWedge allows any app on the device to get data from input sources such as a barcode scanner, MSR, RFID, voice, or serial port and manipulate the data based on options or rules.

Configure DataWedge to:

- Provide data capture services from any app.
- Use a particular scanner, reader, or other peripheral devices.

- Properly format and transmit data to a specific app.

To configure DataWedge, go to techdocs.zebra.com/datawedge/.

NOTE: Do not enable **Decode Haptic Feedback** because the life of the vibrator is significantly reduced in frequent scanning use cases.

Enabling DataWedge

This procedure provides information on how to enable DataWedge on the device.

1. Swipe up from the center of the screen to view all applications.
2. Touch .
3. Touch > **Settings**.
4. Touch the **DataWedge enabled** checkbox.

   A blue checkmark displays in the checkbox indicating that DataWedge is enabled.

Disabling DataWedge

This procedure provides information on how to disable DataWedge on the device.

1. Swipe up from the center of the screen to view all applications.
2. Touch .
3. Touch .
4. Touch **Settings**.
5. Uncheck the **DataWedge enabled** checkbox.

RFID (Radio Frequency Identification)

RFID technology uses radio waves to communicate wirelessly with an RFID tag attached to an object. The RFID reader emits a radio signal that the tag receives, causing it to transmit its stored data back to the reader. The reader decodes and processes the data, allowing for quick and efficient identification and tracking of items for various applications such as inventory management and access control.

RFID Utility

RFID Utility is a Zebra application designed to work with RFID technology. It provides functionalities to interact with RFID readers, tags, and data associated with them. The utilities can perform tasks such as reading RFID tag information, writing data to tags, managing tag inventory, configuring reader settings, and analyzing RFID data. For the latest information on RFID Utility, go to techdocs.zebra.com.

StageNow may also be used to configure specific RFID settings such as:

- Region Selection
- Firmware Updates
- Factory Reset
- Set Default: Transmit Power Level; Query Select, Session, and Target

For more information on StageNow, go to zebra.com/stagenow.

Connecting to the Reader

Use Reader Discovery to establish or sever the connection between the utility and the RFID reader.

1. Tap **RFID Utility.**
2. Tap **Reader Discovery**
3. Tap **Connect** to establish the connection. Tap Disconnect to sever the connection.

Once RFID Utility and the reader are paired, you are ready to use Inventory to Start/Stop periodic inventory.

NOTE:

- Connect Reader Discovery before using Inventory. If Inventory is selected first, the utility will redirect you to Reader Discovery to Connect.
- The utility can connect to the reader automatically.

Collecting Periodic Inventory Data

Periodic Inventory uses smart technologies and periodic stock counts to maintain accurate and up-to-date inventory levels. Use Inventory to Start and Stop inventory scans, and to view the log of assets reads.

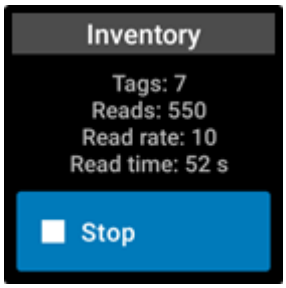
1. Tap **RFID Utility**.
2. Tap **Inventory**.
3. Choose from the following options:
   a) **Start** - To perform inventory.
   b) **Stop** - To stop the inventory.
   c) **Menu** - Displays asset tag data.

NOTE: The tags list displays only if tags have been read.

Application and RFID Power States

The RFID Power States correspond with the Application states.

App Display	App State	RFID State
	**Apps Menu > RFID Utility**	
	The RFID Utility is not running in the background. The RFID Utility is running in the background.	RFID is off.
	**Apps Menu > RFID Utility > Reader Discovery**	
	Reader Discovery is off.	RFID is off.

App Display	App State	RFID State
	**Apps Menu > RFID Utility > Reader Discovery > Disconnected**	
	Reader Discovery is Disconnected.	RFID is off.
	**Apps Menu > RFID Utility > Reader Discovery > Connected**	
	Reader Discovery is Connected.	RFID is in Sleep Mode.
	**Apps Menu > RFID Utility > Inventory**	
	Inventory screen is always on and does not suspend during inventory.	
	**Apps Menu > RFID Utility > Inventory > Start**	
	Inventory Start screen is always on.	RFID is in Sleep Mode.
	**Apps Menu > RFID Utility > Inventory > Stop**	
	Inventory Stop screen is always on.	RFID is Active.

System States Affecting RFID Connection

The following system states can impact the RFID connection when connected to Reader Discovery.

System State	When Connecting	While Connected
Airplane Mode is On.	The device is on Airplane Mode and the connection is not allowed.	RFID will Disconnect.

System State	When Connecting	While Connected
Battery is low.	The battery is low and the connection is not allowed.	RFID will Disconnect.
Device is charging.	The device is charging and the connection is not allowed.	RFID will Disconnect.

RFID Utility Specifications

RFID Profile	Inventory Setting	Default Transmit Power	Session	Tag Population	Link Profile
Optimal Battery	Smart Periodic inv [RF 40 / 300 ms]	20 dBm	S0	1	0
Balance Performance	Smart Periodic inv [RF 50 / 300 ms]	22 dBm	S0	1	0
Fastest Read	Smart Periodic inv [RF 200 / 1000 ms]	24 dBm	S0	10	2
Cycle Count	Smart Periodic inv [RF 20 / 1000 ms]	24 dBm	S1	50	0
Read Configuration	Smart Periodic inv [RF 100 / 500 ms]	Reader config (CSP support)	Reader config (CSP support)	Reader config (CSP support)	Reader config (CSP support)

Supported Decoders

This sections provides the supported decoders for each data capture option.

SR560 Internal Imager Supported Decoders

This section lists the supported decoders for the SR560 internal imager.

Table 7 SR560 Internal Imager-Supported Decoders

Decoder	Default State	Decoder	Default State	Decoder	Default State
Australian Postal	O	EAN8	X	MSI	O
Aztec	X	Grid Matrix	O	PDF417	X
Canadian Postal	O	GS1 DataBar	X	QR Code	X
Chinese 2 of 5	O	GS1 DataBar Expanded	X	Decoder Signature	O

Table 7 SR560 Internal Imager-Supported Decoders (Continued)

Decoder	Default State	Decoder	Default State	Decoder	Default State
Codabar	X	GS1 DataBar Limited	O	TLC 39	O
Code 11	O	GS1 Datamatrix	O	Trioptic 39	O
Code 128	X	GS1 QRCode	O	UK Postal	O
Code 39	X	HAN XIN	O	UPCA	X
Code 93	O	Interleaved 2 of 5	O	UPCE0	X
Composite AB	O	Japanese Postal	O	UPCE1	O
Composite C	O	Korean 3 of 5	O	US4state	O
Discrete 2 of 5	O	MAIL MARK	X	US4state FICS	O
Datamatrix	X	Matrix 2 of 5	O	US Planet	O
Dutch Postal	O	Maxicode	X	US Postnet	O
DotCode	O	MicroPDF	O		
EAN13	X	MicroQR	O		

Key: X = Enabled, O = Disabled, - = Not Supported

Wireless

This section provides information on the wireless features of the device.

The following wireless features are available on the device:

- Wireless Local Area Network (WLAN)
- Bluetooth
- Near Field Communications (NFC)

Wireless Local Area Networks

Wireless local area networks (WLANs) allow the device to communicate wirelessly inside a building. Before using the device on a WLAN, the facility must be set up with the required hardware to support the WLAN (infrastructure). The infrastructure and the device must both be properly configured to enable this communication.

Refer to the documentation provided with the infrastructure (access points (APs), access ports, switches, Radius servers, and so on.) for instructions on how to set up the infrastructure.

Once the infrastructure is set up to enforce the chosen WLAN security scheme, use the **Wireless & networks** settings to configure the device to match the security scheme.

The device supports the following WLAN security options:

- None
- Enhanced Open
- Wireless Equivalent Privacy (WEP)
- Wi-Fi Protected Access (WPA)/WPA2 Personal (PSK)
- WPA3-Personal
- WPA/WPA2 Enterprise
  - Protected Extensible Authentication Protocol (PEAP) - with MSCHAPV2 and GTC authentication.
  - Lightweight Extensible Authentication Protocol (LEAP).
- WPA3 Enterprise
- WPA3 Enterprise 192-bit

Connecting to a Wi-Fi Network

1. Go to **Settings**.
2. Touch **Network & internet**.
3. Touch to open the **Wi-Fi** screen. The device searches for WLANs in the area and lists them.
4. Slide the switch to the **ON** position.

   The device searches for WLANs in the area and displays the list.
5. Scroll through the list and select the desired WLAN network.
6. For open networks, touch profile once or press and hold and then select **Connect** or for secure networks enter the required password or other credentials then touch **Connect**. See the system administrator for more information.

   The device obtains a network address and other required information from the network using the dynamic host configuration protocol (DHCP) protocol. To configure the device with a fixed internet protocol (IP) address, go to Configuring the Device to Use a Static IP Address.
7. In the Wi-Fi setting field, **Connected** displays, indicating that the device is connected to the WLAN.

Wi-Fi Version

When the device is connected to a Wi-Fi network, the Wi-Fi icon on the Status bar indicates the Wi-Fi network version.

Table 8 Wi-Fi Version Icons

Icon	Description
	Connected to Wi-Fi 6, the 802.11ax standard.
	Connected to Wi-Fi 5, the 802.11ac standard.
	Connected to Wi-Fi 4, the 802.11n standard.

Removing a Wi-Fi Network

Remove a remembered or connected Wi-Fi network.

1. Go to **Settings**.
2. Touch **Network & Internet**.
3. Touch **Internet**.
4. Disable the **Wi-Fi** toggle switch.
5. Touch **Saved networks**.
6. Touch the name of the network.
7. Touch **Forget**.

WLAN Configuration

This section provides information on configuring Wi-Fi settings.

Configuring a Secure Wi-Fi Network

Add a Wi-Fi network on the device to connect to the internet.

1. Go to **Settings**.
2. Touch **Network & Internet**.
3. Touch **Internet**.
4. Slide the Wi-Fi switch to the **ON** position.

   The device searches for WLANs in the area and lists them on the screen.
5. Scroll through the list and select the desired WLAN network.
6. Touch the desired network. If network security is **Open**, the device automatically connects to the network. For all other network security, a dialog box displays.
7. If network security is **WPA/WPA2-Personal,WPA3-Personal**, or **WEP**, enter the required password and then touch **Connect**.
8. If network security is **WPA/WPA2-Enterprise** or **WPA3-Enterprise**:

   a) Touch the **EAP method** drop-down list and select one of the following:

   - **PEAP**
   - **TLS**
   - **TTLS**
   - **PWD**
   - **LEAP**

   b) Fill in the appropriate information. Options vary depending on the **EAP method** chosen.

   - When selecting **CA certificate**, Certification Authority (CA) certificates are installed using the **Security** settings.
   - When using the EAP methods PEAP, LEAP, TLS, or TTLS, specify a domain.
   - Touch **Advanced options** to display additional network options.
9. If the network security is **WPA3-Enterprise 192-bit**:

   - Touch **CA certificate** and select a Certification Authority (CA) certificate.

NOTE: Certificates are installed using the Security settings.

   - For WPA3-Enterprise 192-bit, specify a domain.
   - Touch **User certificate** and select a user certificate.

NOTE: User certificates are installed using the Security settings.

   - In the **Identity** text box, enter the username credentials.

NOTE: By default, the network Proxy is set to None and the IP settings is set to DHCP. Go to Configuring for a Proxy Server for setting the connection to a proxy server and Go to Configuring the Device to Use a Static IP Address for setting the device to use a static IP address.

10. Touch **Connect**.

Manually Adding a Wi-Fi Network

Manually add a Wi-Fi network if the network does not broadcast its name (SSID) or to add a Wi-Fi network when out of range.

1. Go to **Settings**.
2. Touch **Network & Internet**.
3. Touch **Internet**.
4. Slide the Wi-Fi switch to the **On** position.
5. Scroll to the bottom of the list and select **Add network**.
6. In the **Network name** text box, enter the name of the Wi-Fi network.
7. In the **Security** drop-down list, set the type of security to:
   - None
   - Enhanced Open
   - WEP
   - WPA/WPA2-Personal
   - WPA3-Personal
   - WPA/WPA2-Enterprise/WPA3-Enterprise
   - WPA3-Enterprise 192-bit
8. If the network security is **None** or **Enhanced Open**, touch **Save**.
9. If the network security is **WEP**, **WPA3-Personal**, or **WPA/WPA2-Personal**, enter the required password and then touch **Save**.
10. If the network security is **WEP** or **WPA/WPA2-Personal**, enter the required password and then touch **Save**.

NOTE: By default, the network Proxy is set to None and the IP settings is set to DHCP. Go to Configuring for a Proxy Server for setting the connection to a proxy server and go to Configuring the Device to Use a Static IP Address for setting the device to use a static IP address.

11. If network security is **WPA/WPA2-Enterprise/WPA3-Enterprise**:
    a) Touch the **EAP method** drop-down list and select one of the following:
       - **PEAP**
       - **LEAP**
       - **TLS**
       - **TTLS**
       - **PWD**

b) Fill in the appropriate information. Options vary depending on the **EAP method** chosen.

- When selecting **CA certificate**, Certification Authority (CA) certificates are installed using the **Security** settings.
- When using the EAP methods PEAP, LEAP, TLS, or TTLS, specify a domain.
- Touch **Advanced options** to display additional network options.

12. If the network security is **WPA3-Enterprise 192-bit**:

- Touch **CA certificate** and select a Certification Authority (CA) certificate.

NOTE: Certificates are installed using the Security settings.

- For WPA3-Enterprise 192-bit, specify a domain.
- Touch **User certificate** and select a user certificate.

NOTE: User certificates are installed using the Security settings.

- In the **Identity** text box, enter the username credentials.

13. Touch **Save**. To connect to the saved network, touch and hold on the saved network and select **Connect to network**.

Configuring for a Proxy Server

A proxy server is a server that acts as an intermediary for requests from clients seeking resources from other servers. A client connects to the proxy server and requests some service, such as a file, connection, web page, or other resource, available from a different server. The proxy server evaluates the request according to its filtering rules. For example, it may filter traffic by IP address or protocol. If the request is validated by the filter, the proxy provides the resource by connecting to the relevant server and requesting the service on behalf of the client.

It is important for enterprise customers to be able to set up secure computing environments within their companies, making proxy configuration essential. Proxy configuration acts as a security barrier ensuring that the proxy server monitors all traffic between the Internet and the intranet. This is normally an integral part of security enforcement in corporate firewalls within intranets.

1. Go to **Settings**.
2. Touch **Network & Internet**.
3. Touch **Internet**.
4. Slide the Wi-Fi switch to the **On** position.
5. In the network dialog box, select and touch a network.
6. If configuring the connected network, touch ✎ to edit the network details and then touch the down arrow to hide the keyboard.
7. Touch **Advanced options**.
8. Touch **Proxy** and select **Manual**.
9. In the **Proxy hostname** text box, enter the address of the proxy server.
10. In the **Proxy port** text box, enter the port number for the proxy server.

11. In the **Bypass proxy for** text box, enter addresses for web sites that are not required to go through the proxy server. Use a comma ",", between addresses. Do not use spaces or carriage returns between addresses.
12. If configuring the connected network, touch **Save** otherwise, touch **Connect**.
13. Touch **Connect**.

Configuring the Device to Use a Static IP Address

By default, the device is configured to use Dynamic Host Configuration Protocol (DHCP) to assign an Internet protocol (IP) address when connecting to a wireless network.

1. Go to **Settings**.
2. Touch **Network & Internet**.
3. Touch **Internet**.
4. Slide the Wi-Fi switch to the **On** position.
5. In the network dialog box, select and touch a network.
6. If configuring the connected network, touch ✎ to edit the network details and then touch the down arrow to hide the keyboard.
7. Touch **Advanced options**.
8. Touch **IP settings** and select **Static**.
9. In the **IP address** text box, enter an IP address for the device.
10. If required, in the **Gateway** text box, enter a gateway address for the device.
11. If required, in the **Network prefix length** text box, enter the prefix length.
12. If required, in the **DNS 1** text box, enter a Domain Name System (DNS) address.
13. If required, in the **DNS 2** text box, enter a DNS address.
14. If configuring the connected network, touch **Save** otherwise, touch **Connect**.

Wi-Fi Preferences

Use the Wi-Fi preferences to configure advanced Wi-Fi settings. From the Wi-Fi screen, scroll down and touch **Network preferences**.

- **Turn on Wi-Fi automatically** - When enabled, Wi-Fi automatically turns back on when near high-quality saved networks.
- **Notify for public networks** - When enabled, notifies when an open network is available.
- **Allow WEP networks** - When enabled, connects to WEP-secured networks.
- **Additional settings** - Touch to view additional Wi-Fi settings.
- **Install Certificates** - Touch to install certificates.
- **Wi-Fi Direct** - Displays a list of devices available for a direct Wi-Fi connection.

Bluetooth

Bluetooth devices can communicate without wires, using frequency-hopping spread spectrum (FHSS) radio frequency (RF) to transmit and receive data in the 2.4 GHz Industry Scientific and Medical (ISM) band (802.15.1). Bluetooth wireless technology is specifically designed for short-range (10 m (32.8 ft)) communication and low power consumption.

Devices with Bluetooth capabilities can exchange information (for example, files, appointments, and tasks) with other Bluetooth enabled devices such as printers, access points, and other mobile devices.

The device supports Bluetooth Low Energy. Bluetooth Low Energy is targeted at applications in the healthcare, fitness, security, and home entertainment industries. It provides reduced power consumption and cost while maintaining standard Bluetooth range.

Adaptive Frequency Hopping

Adaptive Frequency Hopping (AFH) is a method of avoiding fixed frequency interferers, and can be used with Bluetooth voice. All devices in the piconet (Bluetooth network) must be AFH-capable in order for AFH to work. There is no AFH when connecting and discovering devices. Avoid making Bluetooth connections and discoveries during critical 802.11b communications.

AFH for Bluetooth consists of four main sections:

- Channel Classification - A method of detecting an interference on a channel-by-channel basis, or pre-defined channel mask.
- Link Management - Coordinates and distributes the AFH information to the rest of the Bluetooth network.
- Hop Sequence Modification - Avoids interference by selectively reducing the number of hopping channels.
- Channel Maintenance - A method for periodically re-evaluating the channels.

When AFH is enabled, the Bluetooth radio “hops around” (instead of through) the 802.11b high-rate channels. AFH coexistence allows enterprise devices to operate in any infrastructure.

The Bluetooth radio in this device operates as a Class 1 device power class. The maximum output power is 5 mW and the expected range is 20 m (65.5 ft). A definition of ranges based on power class is difficult to obtain due to power and device differences, and whether in open space or closed office space.

NOTE: It is not recommended to perform Bluetooth wireless technology inquiry when high rate 802.11b operation is required.

Security

The current Bluetooth specification defines security at the link level. Application-level security is not specified. This allows application developers to define security mechanisms tailored to their specific needs. Link-level security occurs between devices, not users, while application-level security can be implemented on a per-user basis. The Bluetooth specification defines security algorithms and procedures required to authenticate devices, and if needed, encrypt the data flowing on the link between the devices. Device authentication is a mandatory feature of Bluetooth while link encryption is optional.

Pairing of Bluetooth devices is accomplished by creating an initialization key used to authenticate the devices and create a link key for them. Entering a common personal identification number (PIN) in the devices being paired generates the initialization key. The PIN is never sent over the air. By default, the

Bluetooth stack responds with no key when a key is requested (it is up to you to respond to the key request event). Authentication of Bluetooth devices is based upon a challenge-response transaction. Bluetooth allows for a PIN or passkey used to create other 128-bit keys used for security and encryption. The encryption key is derived from the link key used to authenticate the pairing devices. Also, the limited range and fast frequency hopping of the Bluetooth radios make long-distance eavesdropping difficult.

Recommendations are:

- Perform pairing in a secure environment.
- Keep PIN codes private and do not store the PIN codes in the device.
- Implement application-level security.

Bluetooth Profiles

The device supports the Bluetooth services listed.

Table 9 Bluetooth Profiles

Profile	Description
Service Discovery Protocol (SDP)	Handles the search for known and specific services as well as general services.
Serial Port Profile (SPP)	Allows use of RFCOMM protocol to emulate serial cable connection between two Bluetooth peer devices. For example, connecting the device to a printer.
Advanced Audio Distribution Profile (A2DP)	Allows the device to stream stereo-quality audio to a wireless headset or wireless stereo speakers.
Audio/Video Remote Control Profile (AVRCP)	Allows the device to control A/V equipment to which a user has access. It may be used in concert with A2DP.
Headset Profile (HSP)	Allows a hands-free device, such as a Bluetooth headset, to place and receive calls on the device.
Hands-Free Profile (HFP)	Allows car hands-free kits to communicate with the device in the car.
Out of Band (OOB)	Allows exchange of information used in the pairing process. Pairing is completed using the Bluetooth radio, but requires information from the OOB mechanism. Using OOB with NFC enables pairing when devices simply get close, rather than requiring a lengthy discovery process.
Symbol Serial Interface (SSI)	Allows for communication with Bluetooth Imager.
Generic Attribute Profile (GATT)	Provides profile discovery and description services for Bluetooth Low Energy protocol. It defines how attributes are grouped together into sets to form services.
Generic Access Profile (GAP)	Use for device discovery and authentication.

Bluetooth Power States

The device Bluetooth radio is off by default.

- **Suspend** - When the device goes into Sleep mode, the Bluetooth radio stays on.
- **Airplane Mode** - When the device is placed in Airplane Mode, the Bluetooth radio is not turned off when the device is connected to a Bluetooth headset or hearing device.

Bluetooth Radio Power

Turn off the Bluetooth radio to save power or if entering an area with radio restrictions (for example, an airplane). When the radio is off, other Bluetooth devices cannot see or connect to the device. Turn on the Bluetooth radio to exchange information with other Bluetooth devices (within range). Communicate only with Bluetooth radios in close proximity.

NOTE: To achieve optimal battery life, turn off radios when not in use.

Enabling Bluetooth

1. Swipe down from the Status bar to open the Notification panel.
2. Touch to turn Bluetooth on.

Disabling Bluetooth

1. Swipe down from the Status bar to open the Notification panel.
2. Touch to turn Bluetooth off.

Discovering Bluetooth Device(s)

The device can receive information from discovered devices without pairing. However, once paired, the device and a paired device exchange information automatically when the Bluetooth radio is on.

1. Ensure that Bluetooth is enabled on both devices.
2. Ensure that the Bluetooth device to discover is in discoverable mode.
3. Ensure that the two devices are within 10 m (32.8 ft) of one another.
4. Swipe down from the Status bar to open the Quick Access panel.
5. Touch and hold **Bluetooth**.
6. Touch **Pair new device**. The device begins searching for discoverable Bluetooth devices in the area and displays them under **Available devices**.
7. Scroll through the list and select a device. The Bluetooth pairing request dialog box displays.
8. Touch **Pair** on both devices.
9. The Bluetooth device is added to the **Paired devices** list and a trusted (“paired”) connection is established.

Changing the Bluetooth Name

By default, the device has a generic Bluetooth name that is visible to other devices when connected.

1. Go to **Settings**.
2. Touch **Connected devices** > **Connection preferences** > **Bluetooth**.
3. If Bluetooth is not on, move the switch to turn Bluetooth on.
4. Touch **Device name**.
5. Enter a name and touch **RENAME**.

Connecting to a Bluetooth Device

Once paired, connect to a Bluetooth device.

1. Go to **Settings**.
2. Touch **Connected devices** > **Connection preferences** > **Bluetooth**.
3. In the list, touch the unconnected Bluetooth device.

   When connected, **Connected** displays below the device name.

Selecting Profiles on the Bluetooth Device

Some Bluetooth devices have multiple profiles.

1. Go to **Settings**.
2. Touch **Connected devices** > **Connection preferences** > **Bluetooth**.
3. In the **Paired Devices** list, touch ⚙ next to the device name.
4. Turn on or off a profile to allow the device to use that profile.

Unpairing a Bluetooth Device

Unpairing a Bluetooth device erases all pairing information.

1. Go to **Settings**.
2. Touch **Connected devices** > **Connection preferences** > **Bluetooth**.
3. In the **Paired Devices** list, touch ⚙ next to the device name.
4. Touch **FORGET**.

Near Field Communications

NFC/HF RFID is a short-range wireless connectivity technology standard that enables a secure transaction between a reader and a contactless smart card.

The device supports the following operating modes:

- Reader mode.
- Card Emulation mode.

Using NFC, the device can:

- Read contactless cards such as contactless tickets, and ID cards.
- Read and write information to contactless cards, such as SmartPosters and tickets, as well as devices with an NFC interface, such as vending machines.
- Read information from supported medical sensors.
- Pair with supported Bluetooth devices.
- Exchange data with another NFC device.
- Emulate contactless cards.

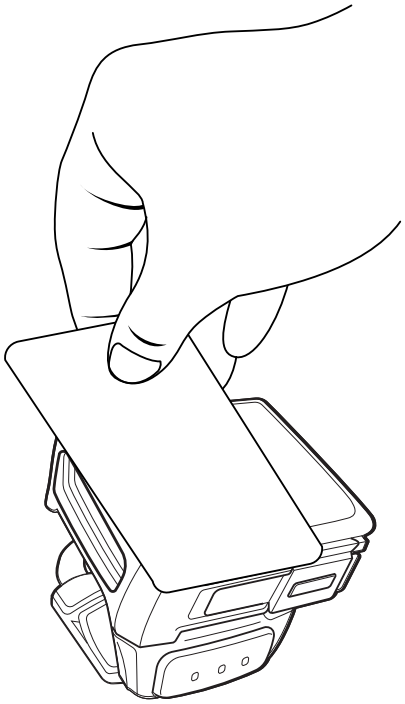
Supported NFC cards:

- Mifare Standard / Classic.
- Mifare Ultralight.
- Mifare DESFire v3.
- TI tag-it Plus 2K (ISO 15693).
- NFC Tag Type 1 (NDEF Topaz).
- NFC Tag Type 2 (NDEF NTAG).
- NFC Tag Type 3 (NDEF FeliCa).
- NFC Tag Type 5 (NDEF Vicinity tag) or NXP Icode SLI-X.
- UPM Midas NTAG213 token 20 mm.
- NXP i-Code SLI token 16 mm.
- NFC Barcode.

Reading NFC Cards

Read contactless cards using NFC.

1. Launch an NFC-enabled application.
2. Move the NFC card to top of the device until it detects the card.



3. Hold the card steadily until the transaction is complete (usually indicated by the application).

Accessories

This section provides information for using the accessories for the device.

Device Accessories

This table provides the accessories available for the device.

Accessory	Part Number	Description
Charge-Only Cradles		
2-Slot Charge-Only Cradle	CRD-WS5X-2SRD-01	Charges up to two scanners. Requires power supply (PWR-BGA12V50W0WW), DC line cord (CBL-DC-388A1-01), and country-specific AC line cord.
10-Slot Charge-Only Cradle	CRD-WS5X-10SRD-01	Charges up to ten scanners. Requires power supply (PWR-BGA12V108W0WW), DC line cord (CBL-DC-381A1-01), and country-specific AC line cord.
Mounting Bracket	BRKT-SCRD-SMRK-01	Rack/Wall mounting bracket for multi-slot cradles.
Batteries and Chargers		
1300 mAh High Capacity Battery	BTRY-WS5X-13MA-01	Spare battery for the scanner.
2400 mAh High Capacity Battery	BTRY-WS5X-24MA-01	Spare battery for the RFID scanner.
4-Slot Battery Charger	SAC-WS5X-4S13-01	Charges up to four 1300 mAh spare batteries. Requires power supply (PWR-BGA12V50W0WW), DC line cord (CBL-DC-388A1-01), and country-specific AC line cord.
RFID 4-Slot Battery Charger	SAC-WS5X-4S24-01	Charges up to four 2400 mAh spare batteries. Requires power supply (PWR-BGA12V50W0WW), DC line cord (CBL-DC-388A1-01), and country-specific AC line cord.
20-Slot Battery Charger	SAC-WS5X-20S13-01	Charges up to twenty 1300 mAh spare batteries. Requires power supply (PWR-BGA12V108W0WW), DC line cord (CBL-DC-382A1-01), and country-specific AC line cord.

Accessory	Part Number	Description
RFID 20-Slot Battery Charger	SAC-WS5X-20S24-01	Charges up to twenty 2400 mAh spare batteries. Requires power supply (PWR-BGA12V108W0WW), DC line cord (CBL-DC-381A1-01), and country-specific AC line cord.
Charge and Communication Cable		
USB Communication and Charge Cable	CBL-WS5X-USBA-01	Cable provide USB communication and power to the device.
Shell		
Scanner Shell	SG-WS5X-SHLCS-01	Replacement of the shell for the scanner.
Triggers and Soft Goods		
Screen Protector	SG-WS5X-SCRNP1-01	Provides additional screen protection.
Trigger Assembly	SG-WS5X-TRGA-01	Replacement trigger assembly for the scanner.
Finger Strap	SG-WS5X-STRP-10	Replacement finger strap for the scanner (10-pack).
Back of Hand (BOH) Mount	SG-WS5X-BHRS-01	Replacement BOH mount.
Deflector	SG-WS5X-DFLTR-01	Replacement protective deflector the RFID scanner. Includes mounting screws.
Comfort Pad	SG-WS5X-CMPDR-01	Replacement comfort pad for the RFID scanner.
Wrist Mount Plate	SG-WS5X-WSPLRS-01	Wrist mount plate for the RFID scanner.
RFID External Antennas		
External Antenna	CBL-WS5X-ANTR8S-01	RFID antenna with cable, 800MHz, 210mm length for wrist mount left hand (EMEA).
External Antenna	CBL-WS5X-ANTR8L-01	RFID antenna with cable, 800MHz, 240mm length for BOH and wrist mount right hand (EMEA).
External Antenna	CBL-WS5X-ANTR9S-01	RFID Antenna with cable, 900MHz, 210mm length for wrist mount left hand (North America and Rest of World).
External Antenna	CBL-WS5X-ANTR9L-01	RFID antenna with cable, 900MHz, 240mm length for BOH and wrist mount right hand (North America and Rest of World).
RFID External Antenna Holders for Back of Hand Mounts		
Antenna Holder	SG-WS5X-BHAHRS-01	RFID BOH antenna holder, right, small.
Antenna Holder	SG-WS5X-BHAHRL-01	RFID BOH antenna holder, right, large.
Antenna Holder	SG-WS5X-BHAHLS-01	RFID BOH antenna holder, left, small.
Antenna Holder	SG-WS5X-BHAHLL-01	RFID BOH antenna holder, left, large.
Power Supply		

Accessory	Part Number	Description
Power Supply	PWR-BGA12V50W0WW	Provides power to the 2-Slot Charge-Only Cradle and 4-Slot Battery Charger. Requires AC line cord.
Power Supply	PWR-BGA12V108W0WW	Provides power to the 10-Slot Charge-Only Cradle and 20-Slot Battery Charger. Requires DC line cord CBL-DC-382A1-01, and country-specific three-wire grounded AC line cord sold separately.
Power Supply	PWR-WUA5V12W0US	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in the United States.
Power Supply	PWR-WUA5V12W0GB	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in the United Kingdom.
Power Supply	PWR-WUA5V12W0EU	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in the European Union.
Power Supply	PWR-WUA5V12W0AU	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in Australia.
Power Supply	PWR-WUA5V12W0CN	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in China.
Power Supply	PWR-WUA5V12W0BR	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in Brazil.
Power Supply	PWR-WUA5V12W0KR	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in Korea.
Power Supply	PWR-WUA5V12W0IN	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in India.
Power Supply	PWR-WUA5V12W0AR	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in Argentina.
Power Supply	PWR-WUA5V12W0LA	Provides 5 VDC, 2.5 A power to the USB cable. Includes plug adapter for use in Latin America.
DC Line Cord	CBL-DC-388A1-01	Provides power from the power supply (PWR-BGA12V50W0WW) to the 2-Slot Charge-Only Cradle and 4-Slot Battery Charger.
DC Line Cord	CBL-DC-381A1-01	Provides power from the power supply (PWR-BGA12V108W0WW) to the 10-Slot Charge-Only Cradle with and 20-Slot Battery Charger.

Battery Charging

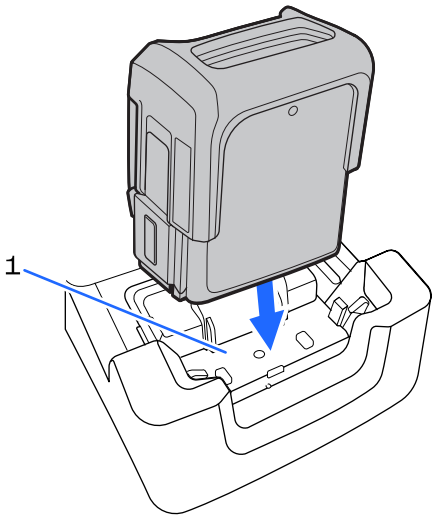
Charge the device with a battery installed or charge the spare batteries.

Charging the Main Battery

Charge the battery in a device with one of the charge-only cradles or the USB charge cable.

CAUTION: Ensure that you follow the guidelines for battery safety described in the Battery Safety Guidelines.

1. Connect the charger to a power source.
2. Insert the device into a cradle slot (1) or attach it to the USB charge cable.

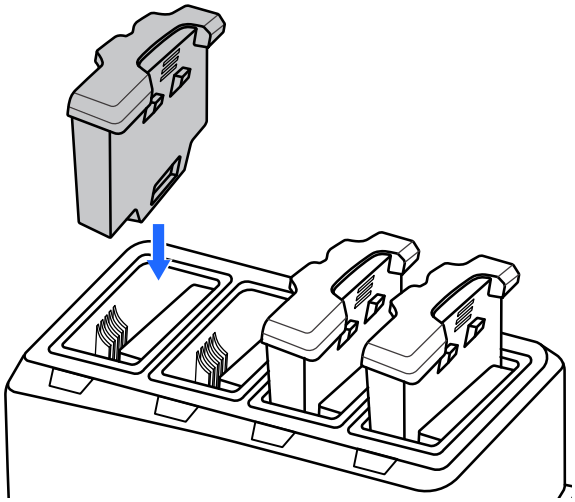


The device turns on and begins charging. The Notification LED on the touch panel displays amber while charging, then turns solid green when fully charged.

Charging the Spare Battery

Charge the spare battery with one of the battery chargers.

1. Connect the charger to a power source.
2. Insert the battery into a battery charging well.



3. Gently press down on the battery to ensure proper contact.

The spare battery charging LED on the battery charger indicates the status of the battery charging.

Charging Indicators

The spare battery charging LED on the cradle cup indicates the status of the spare battery charging.

Table 10 Spare Battery Charging LED Indicators

State	Indication
Off	The battery is not charging. The battery is not inserted correctly in the cradle or connected to a power source. Cradle is not powered.
Solid Amber	Healthy battery is charging.
Solid Green	Healthy battery charging is complete.
Fast Blinking Red (2 blinks/ second)	Charging error, for example: • Temperature is too low or too high. • Charging has gone on too long without completion (typically eight hours).
Solid Red	Unhealthy battery is charging or fully charged.

Charging Temperature

Charge batteries in temperatures from 0°C to 40°C (32°F to 104°F). The device or cradle always performs battery charging in a safe and intelligent manner. At higher temperatures (for example, approximately +37°C (+98°F) the device or cradle may, for short periods, alternately enable and disable battery charging to maintain the battery at an acceptable temperature. The device and cradle indicate when charging is disabled due to abnormal temperatures via their LED.

Hot Swap Mode

The device supports Hot Swap mode where the user can replace the battery without powering off the device.

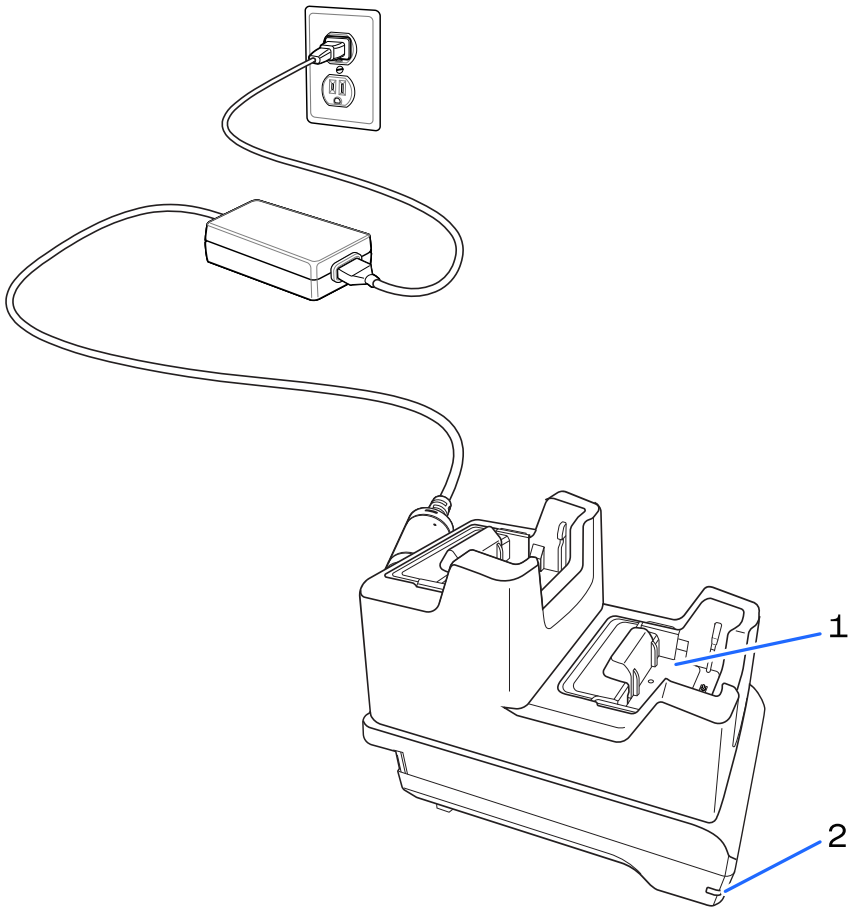
When the user removes the device from the shell, the display turns off and the device enters a low-power state (indicated by a single red flash of the scan/custom LED). Replace the battery within two minutes to preserve memory persistence.

2-Slot Charge-Only Cradle

The 2-Slot Charge-Only Cradle provides 12 VDC nominal power for operating the device and charges the device's battery.

CAUTION: Ensure that you follow the guidelines for Battery Safety.

Figure 20 2-Slot Charge-Only Cradle



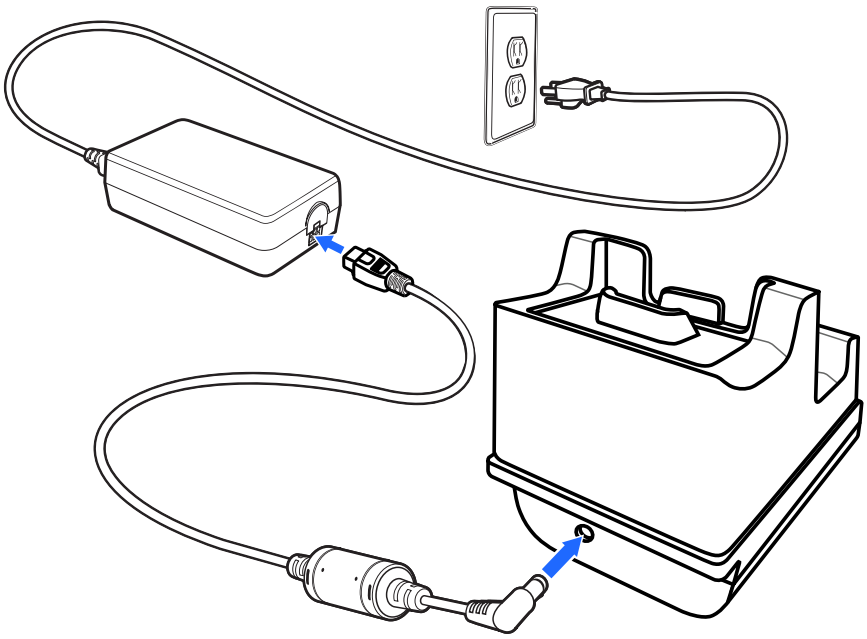
1	Device charging slot
2	Power LED

NOTE: Insert the device properly in the slot to charge it.

Setup

The 2-slot charge-only cradle provides device charging.

Figure 21 2-Slot Charge-Only Cradle Setup

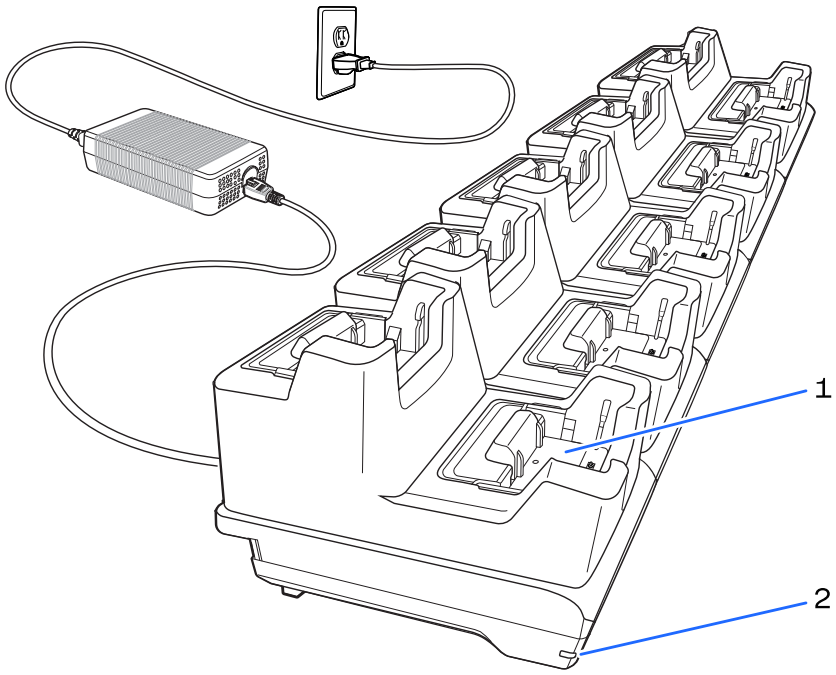


10-Slot Charge-Only Cradle

The 10-Slot Charge-Only Cradle provides 12 VDC nominal power for operating the device and charges the device's battery.

CAUTION: Ensure that you follow the guidelines for Battery Safety.

Figure 22 10-Slot Charge-Only Cradle



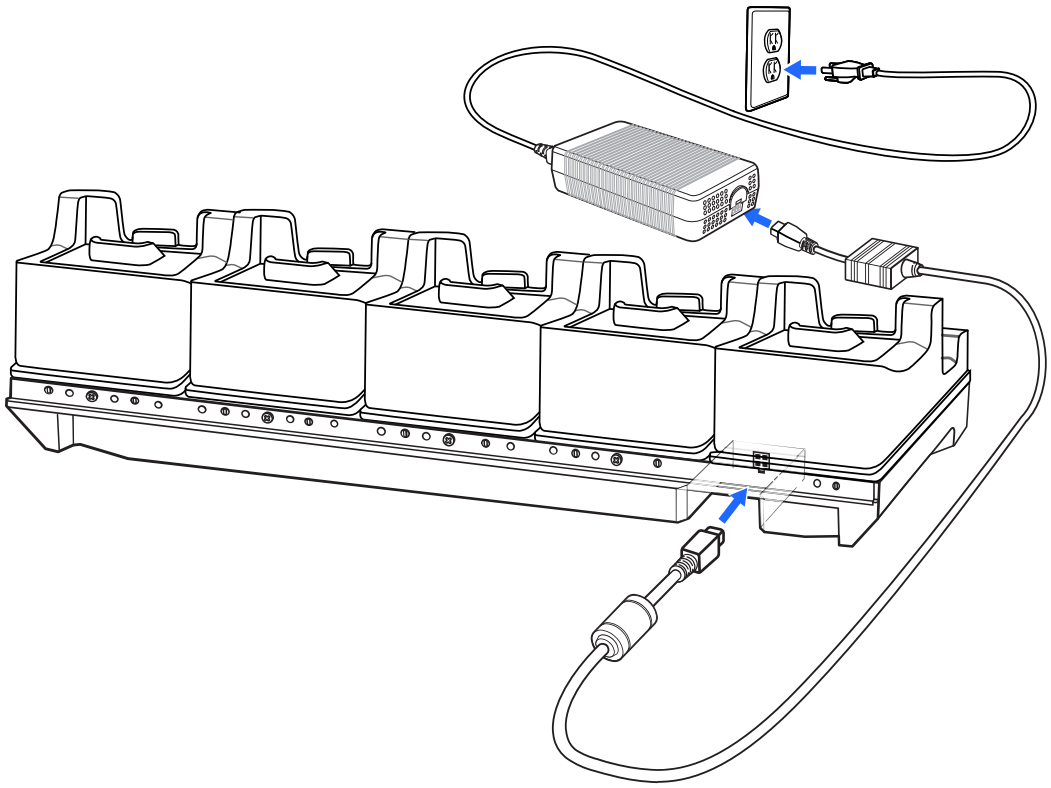
1	Device charging slot
2	Power LED

NOTE: Insert the device properly in the slot to charge it.

Setup

The 10-slot charge-only cradle provides device charging.

Figure 23 10-Slot Charge-Only Cradle Setup

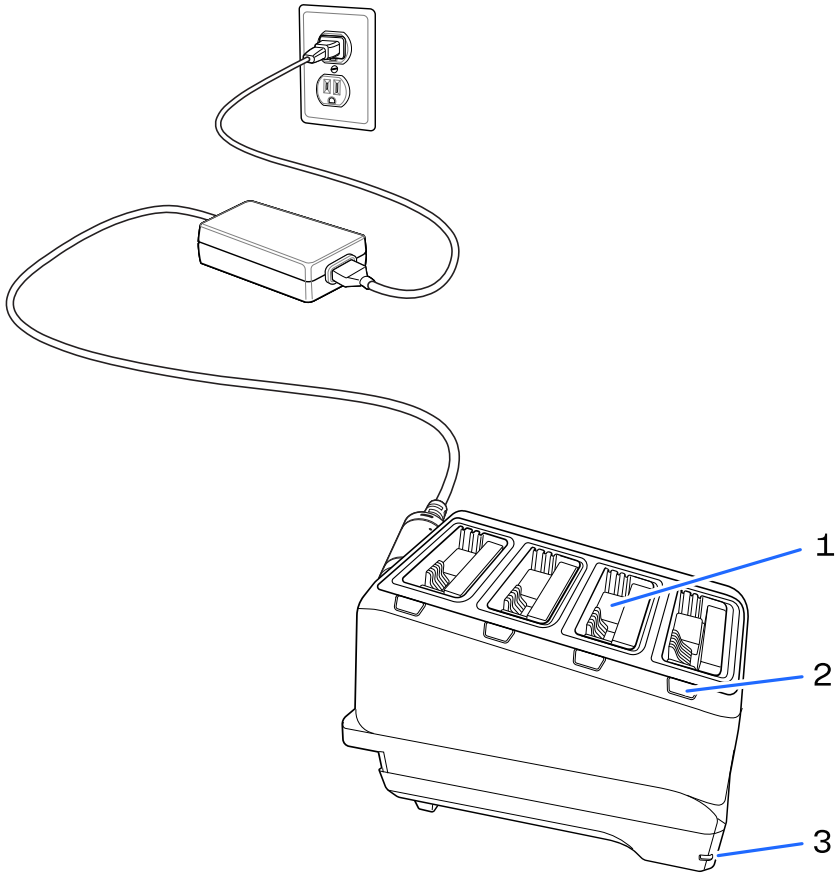


4-Slot Battery Charger

The 4-Slot Battery Charger charges up to four spare batteries.

CAUTION: Ensure that you follow the guidelines for Battery Safety.

Figure 24 4-Slot Battery Charger



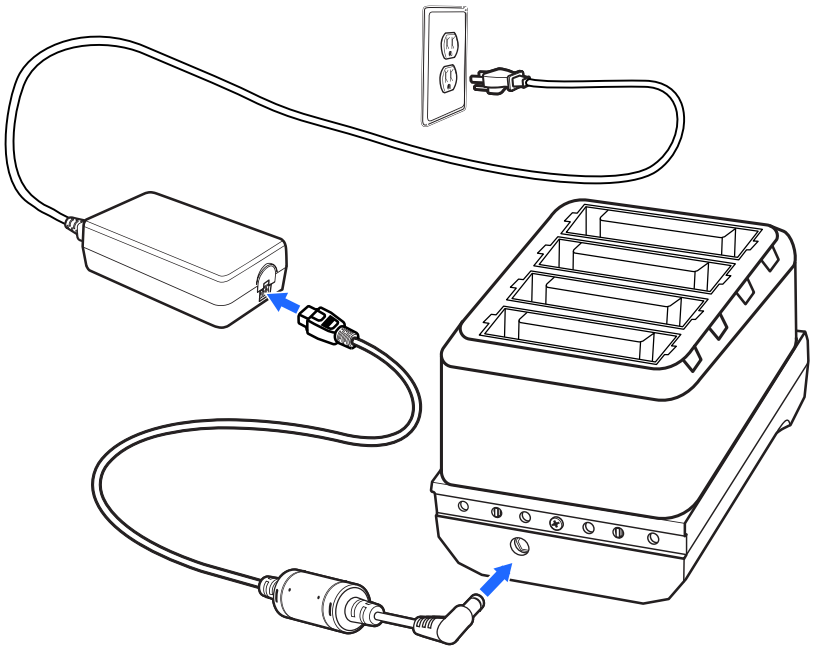
1	Battery slot
2	Battery charging LED
3	Power LED

NOTE: Insert the battery properly in the slot to charge it.

Setup

The 4-slot battery charger provides up to four spare battery charging.

Figure 25 4-Slot Battery Charger Setup

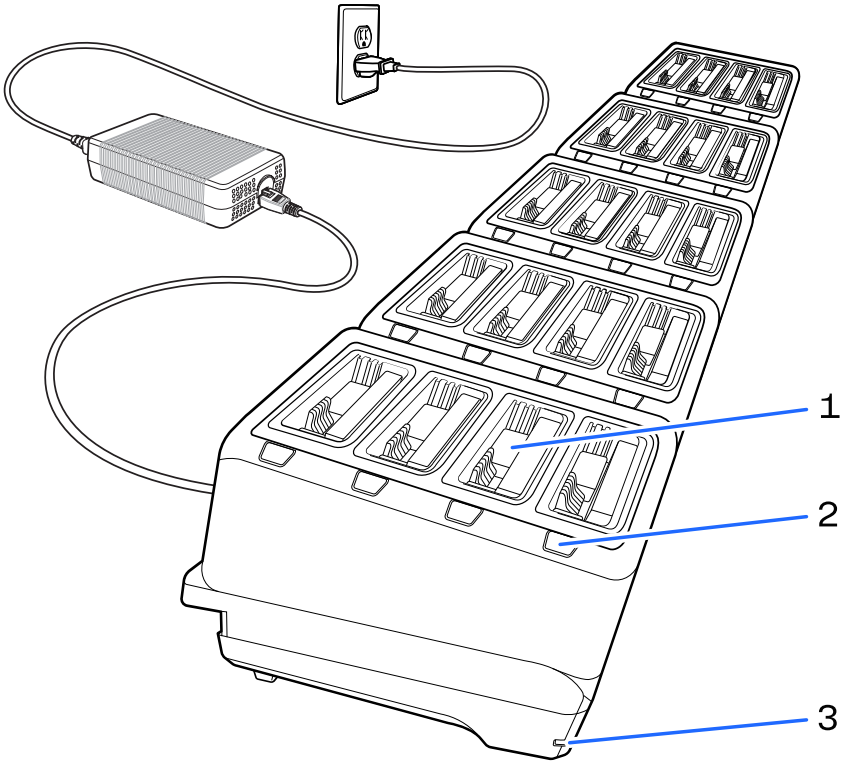


20-Slot Battery Charger

The 20-Slot Battery Charger charges up to 20 spare batteries.

CAUTION: Ensure that you follow the guidelines for Battery Safety.

Figure 26 20-Slot Battery Charger



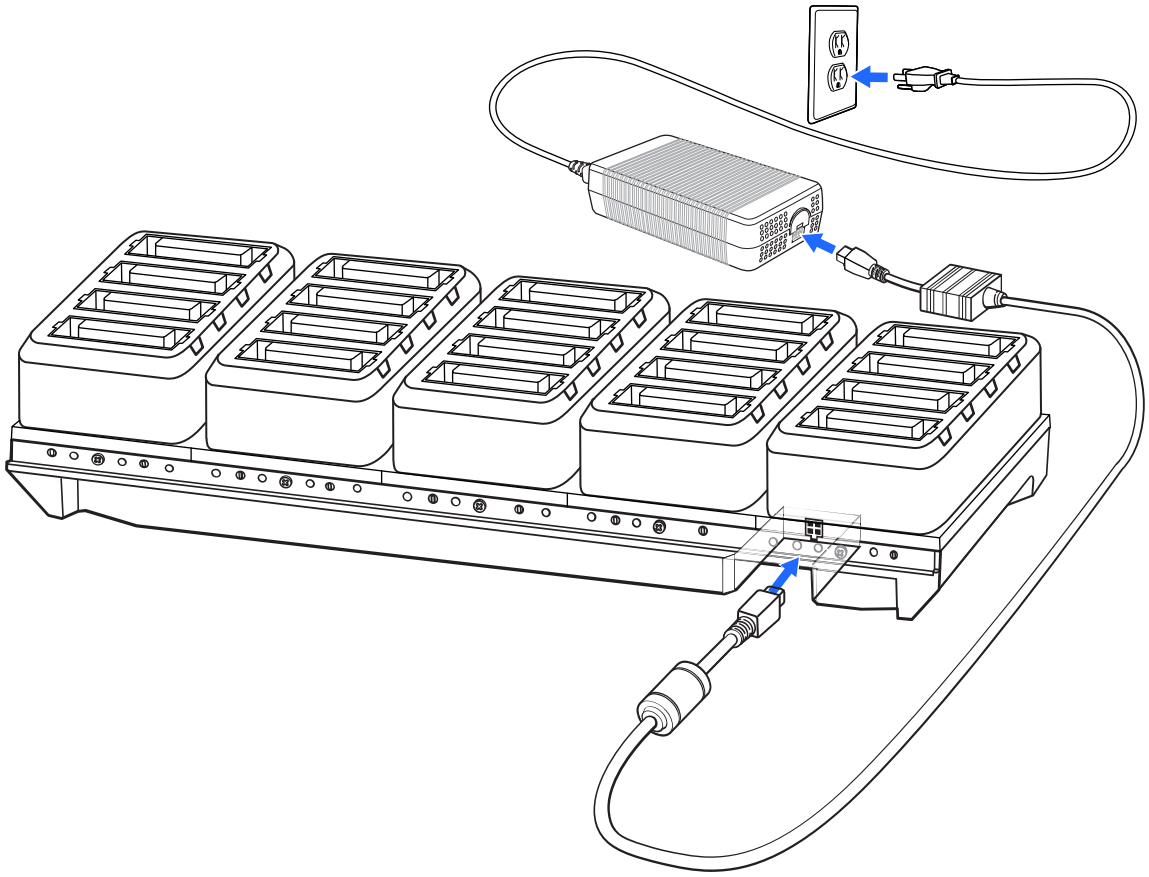
1	Battery slot
2	Battery charging LED
3	Power LED

NOTE: Insert the battery properly in the slot to charge it.

Setup

The 20-slot battery charger can charge up to 20 spare batteries.

Figure 27 20-Slot Battery Charger Setup



USB Charge Cable

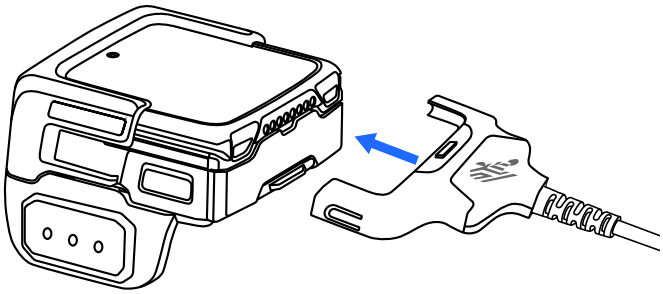
The USB Charge Cable snaps onto the bottom of the device and is easily removed when not in use. The cable charges the device and allows the device to transfer data to a host computer.

Connecting the USB Charge Cable to the Device

Insert the USB Charge Cable straight onto the device until the device touches the bottom of the cable cup.

NOTE: The device must be in the shell before being connected to the USB Charge Cable.

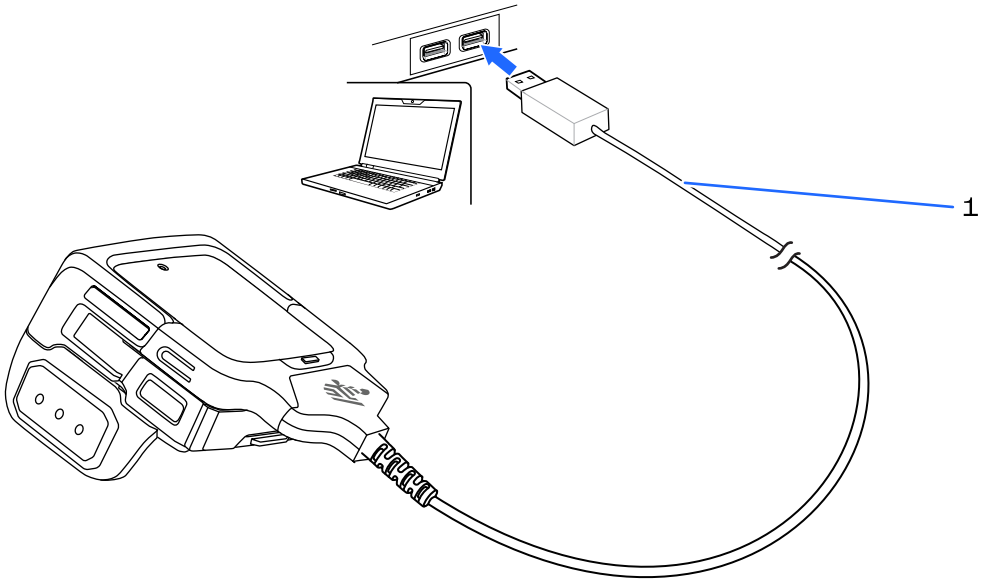
Connect the USB Charge Cable to the WS501 Scanner.



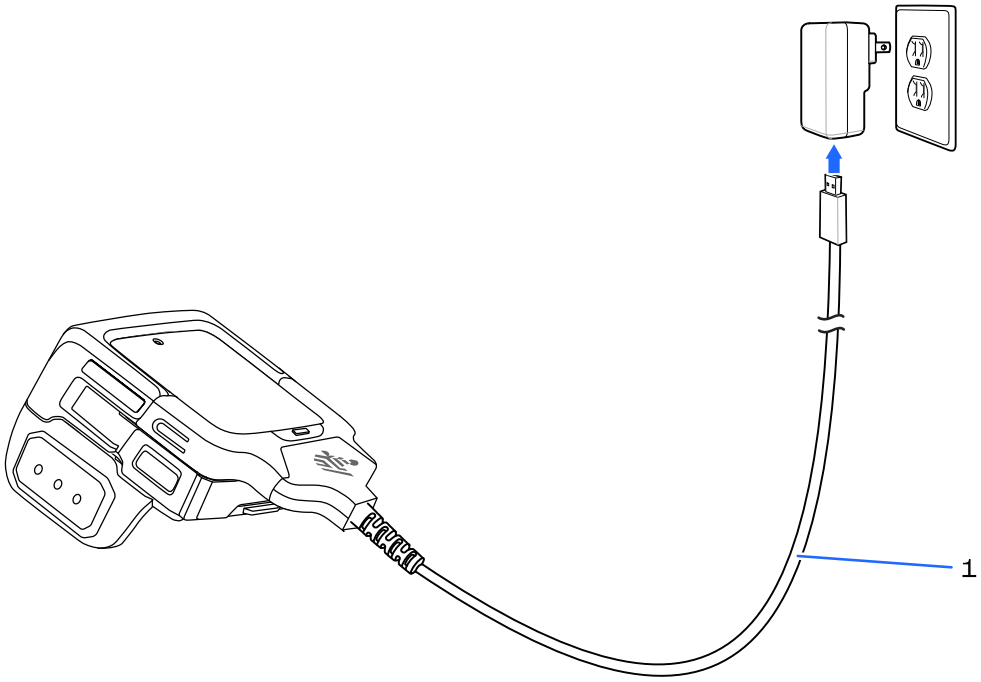
USB Communication and Charging

Use the USB Charge Cable for device charging and transferring data to a host computer.

- With the USB Charge Cradle attached to the device, connect the USB-A end to the host computer.



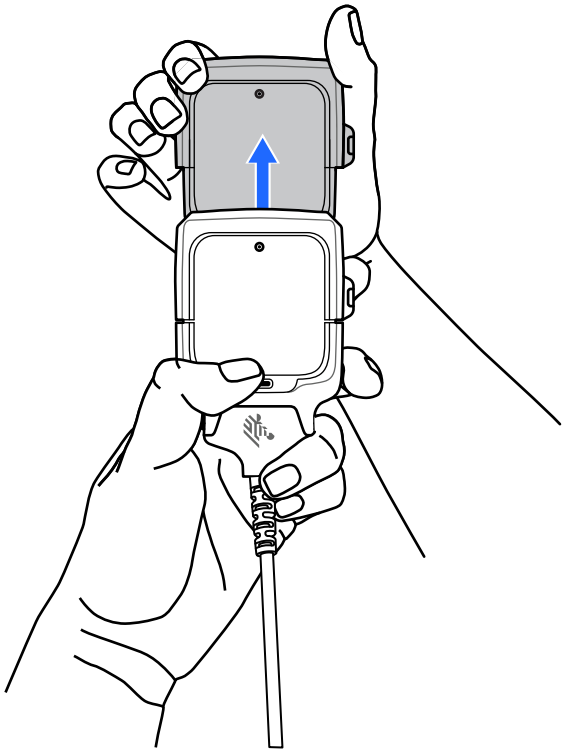
- To charge the device with the USB Charge Cable, first ensure the USB Charge Cradle is connected to the device, and then connect the USB-A end to the power supply.



Disconnecting the USB Charge Cable

Disconnect the USB charge cable carefully from the device after use.

1. Grasp the cable cup in one hand and the device in the other hand.
2. Remove the device by pulling straight up.

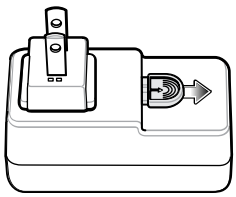


USB Power Supply

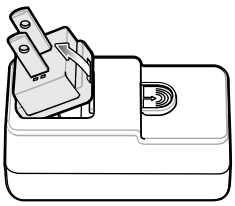
Use the power supply with the USB cable to charge the device. The power supply comes in various configurations with different plug adapters for use internationally.

Setting Up the USB Power Supply

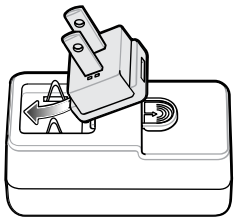
1. Pull the release button down.



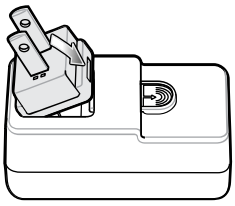
2. Rotate the plug adapter up and out of the power supply.



3. Insert the replacement plug adapter into the power supply.



4. Rotate the plug adapter down, and snap it into place.



Trigger Assembly

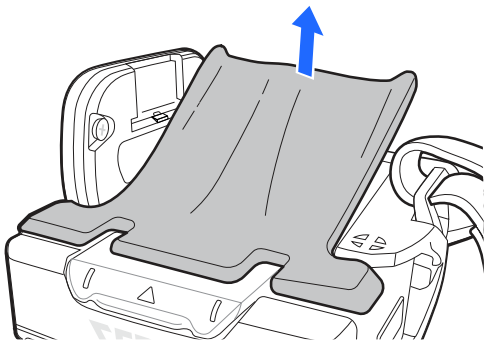
The WS501 Scanner with the trigger assembly is worn on the index and middle fingers. A screw is provided for the users to secure the trigger assembly on the device.

You can install a screw to the trigger assembly on the Scanner to prevent other users from unmounting it. Go to Locking the Trigger Assembly for instructions.

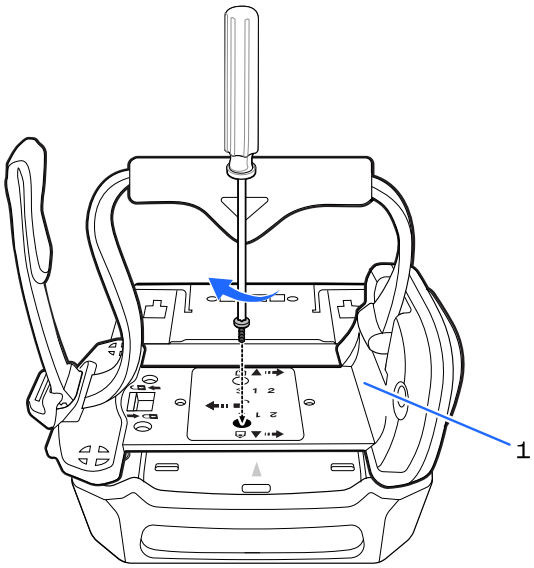
Locking the Trigger Assembly

To prevent the operator from removing the trigger assembly, secure it on the WS501 Scanner using a screw (provided).

1. On the bottom of the device, lift the finger comfort pad from the front of the device, and then lift it from the rear.



2. To secure the trigger assembly (1), use a Torx T4 screwdriver to tighten a screw (provided) with a torque requirement of 0.9 kgf-cm (5.0 lbf-in).



Deflector on the WS501 Scanner

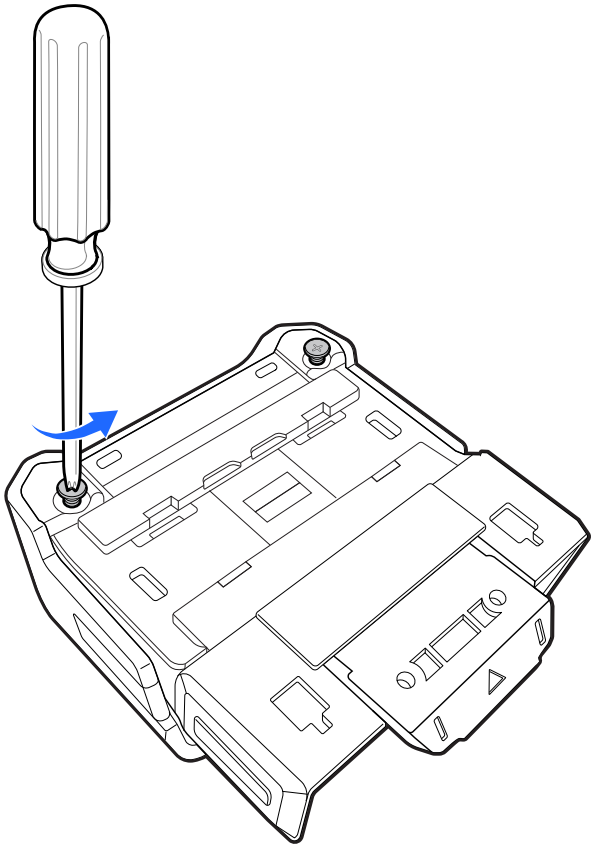
The deflector on the WS501 Scanner adds protection to the touch screen and the SE4770 scan engine. The deflector has laser safety warning markings and must always be fitted when using the device.

Replacing the Deflector

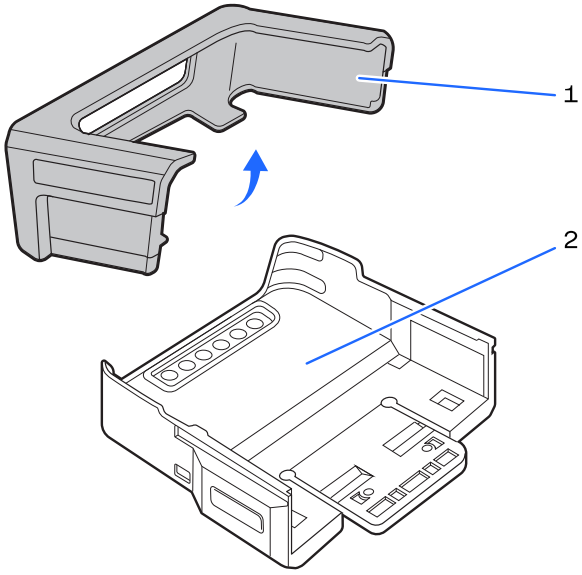
The deflector is mounted to the scanner shell with two screws. Replace a new deflector when necessary.

Unmount the device from the trigger and shell assembly, and then unmount the trigger assembly.

1. Loosen the screws underneath the shell.



2. Rotate the deflector (1) away from the shell (2).



3. Replace a new deflector to the shell.
4. Torque screws underneath the shell to 1.2 kgf-cm (6.7 lbf-in) with a Phillips PH0 screwdriver.

Replace the device into the shell, and then replace the trigger assembly.

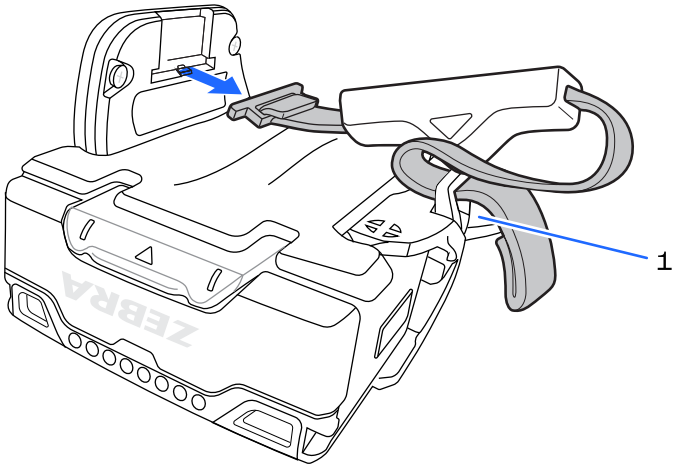
Finger Strap of the Trigger Assembly

The finger strap is used for securely holding the WS501 Scanner on the index and middle fingers. Replace the finger strap on the trigger assembly when necessary.

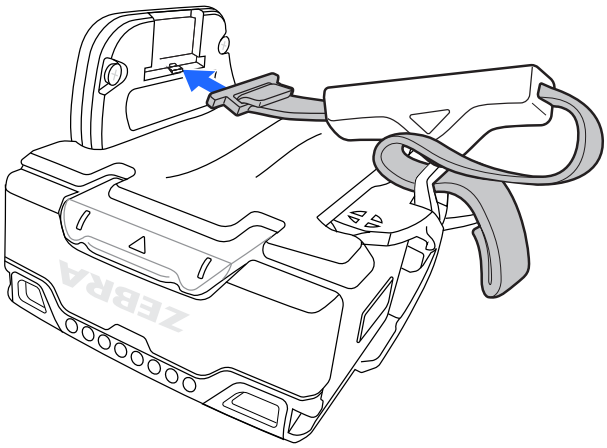
Replacing the Finger Strap

The finger strap on the trigger assembly is removable.

- To remove the finger strap:
  - **a)** Pull the finger strap horizontally away from the locking slot.



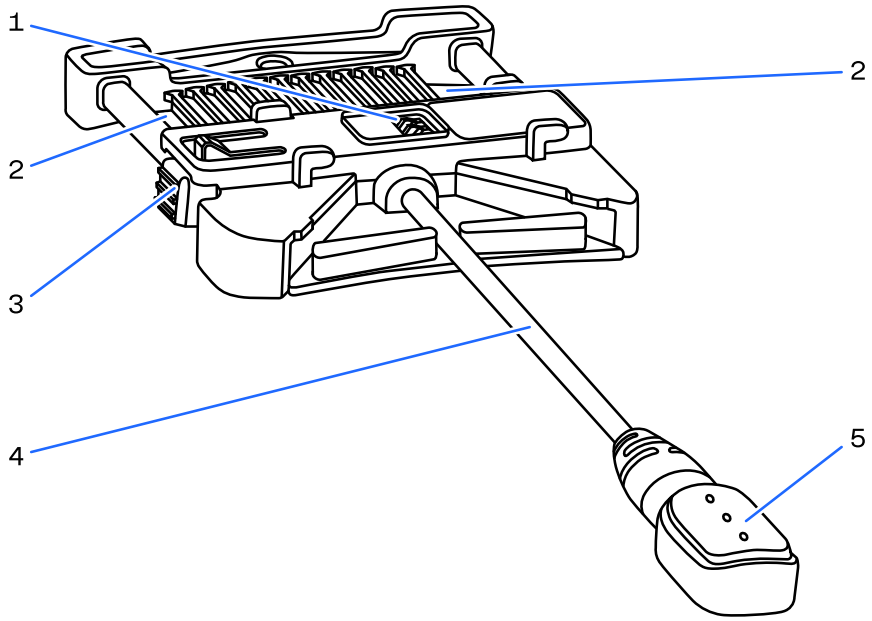
  - **b)** Lift the strap buckle (1) before pulling the other end of the strap away.
- To replace the finger strap:
  - **a)** Lift the strap buckle and push the end of the finger strap through.
  - **b)** Insert the finger strap horizontally into the locking slot as shown.



Back of Hand Mount

The back of hand (BOH) mount allows the WS501 Scanner to be installed on the back of your hand and provides a remote finger trigger. It must be used with the hand mount glove and is available for right-handed and left-handed users.

Figure 28 Back of Hand Mount



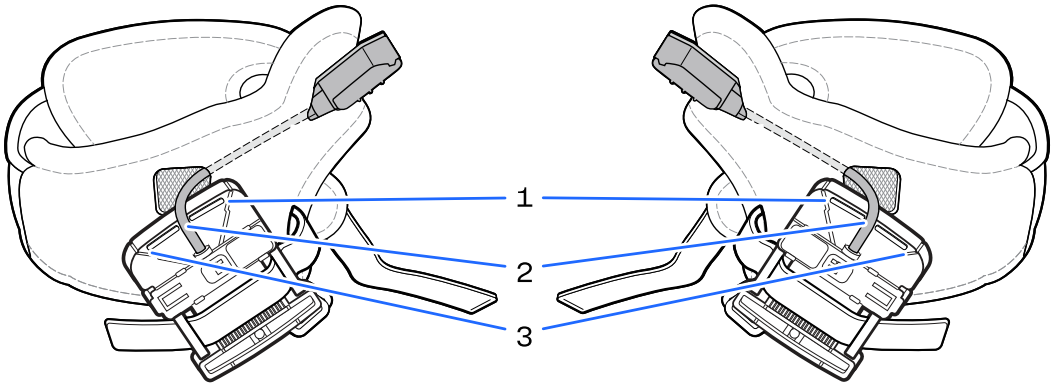
1	BOH mount contacts
2	Glove strap slot
3	BOH mount latch
4	Trigger cable
5	Finger trigger

Installing the Back of Hand Mount

Mount the Back of Hand (BOH) mount to the hand wrap, and then install the device in the shell onto the BOH mount.

Determine whether the device is used on the right or left hand.

NOTE: The described procedures are applicable to both right-handed and left-handed users. The steps in this section use a right-hand wrap as an example.

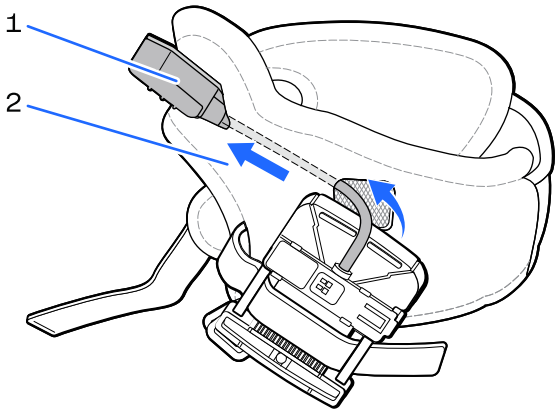


The BOH mount has three slots for you to position the trigger cable. Insert the trigger cable into one of the slots according to the size of your hand:

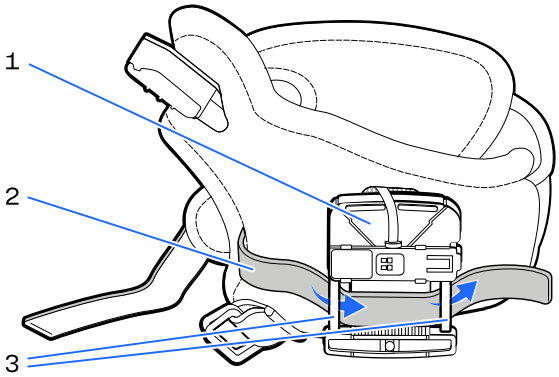
1	For large-handed users
2	For medium-handed users
3	For small-handed users

1. To mount a BOH mount to the hand wrap:

   a) Insert the trigger cable and button (1) through the trigger slot of the hand wrap (2).

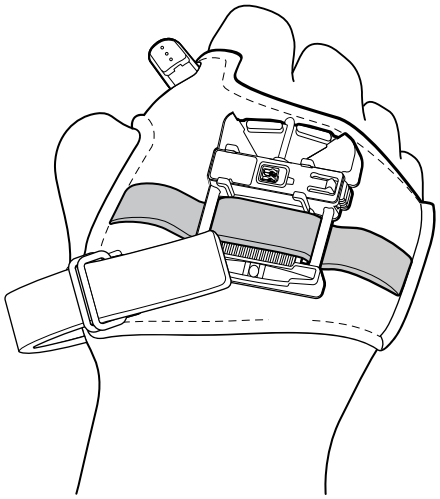


   b) Insert the strap (2) through one of the strap slots (3) on the BOH mount (1).

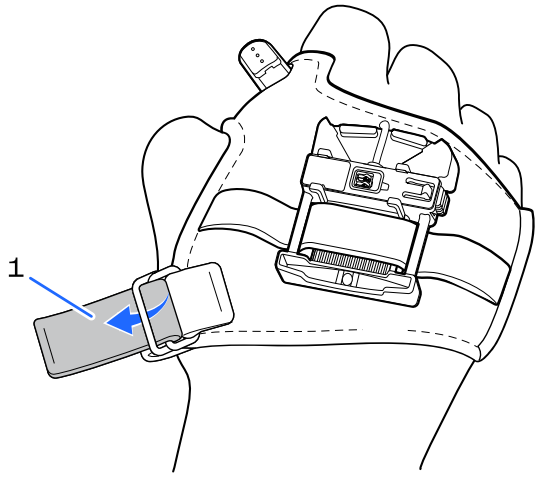


   c) Insert the strap through the other slot of the mount, and then fasten it with the hook and loop fastener.

2. Position the hand wrap on the hand by sliding your hand through the hand wrap, with your thumb through the smaller opening and your remaining four fingers through the larger opening.

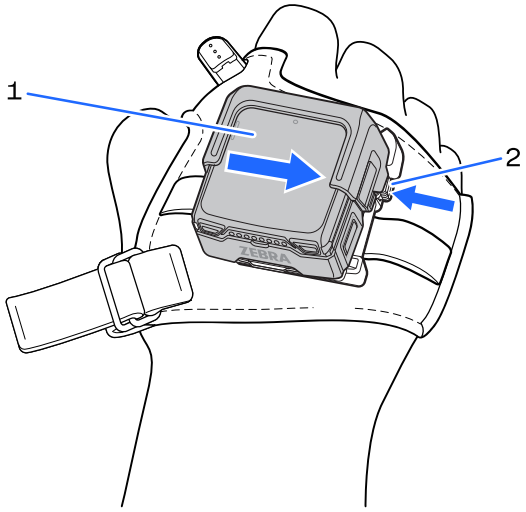


3. Slide the strap (1) through the buckle and secure the end of the strap in place with the hook and loop fastener.



Adjust the strap to a comfortable position to fit securely by tightening or loosening the strap.

4. Position the trigger button so that the button is easily accessible to your thumb, and then secure it on the hand wrap using the hook and loop fastener.
5. Slide the device (1) in the shell onto the BOH mount.Press the BOH mount button (2) when mounting.



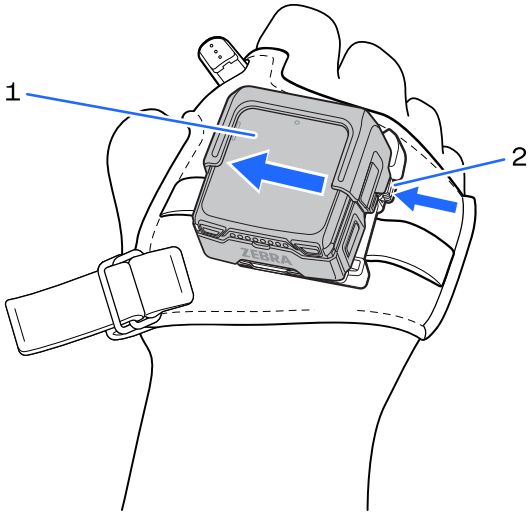
Release the button (2) when the device snaps into place on the BOH mount.

6. Reposition the mount on the hand wrap to align the mount with the middle finger knuckle.
7. Tighten or loosen the hand wrap strap, if necessary.

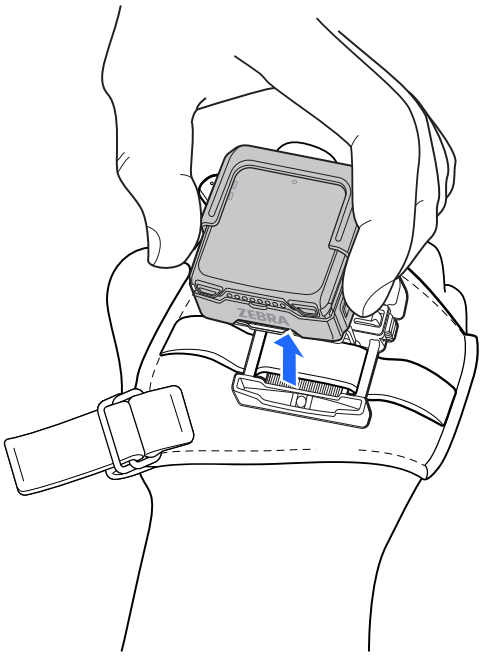
To unmount the device in the shell from the BOH mount, press the BOH mount button and slide the device in the shell away from the BOH mount button.

Unmounting the Back of Hand Mount

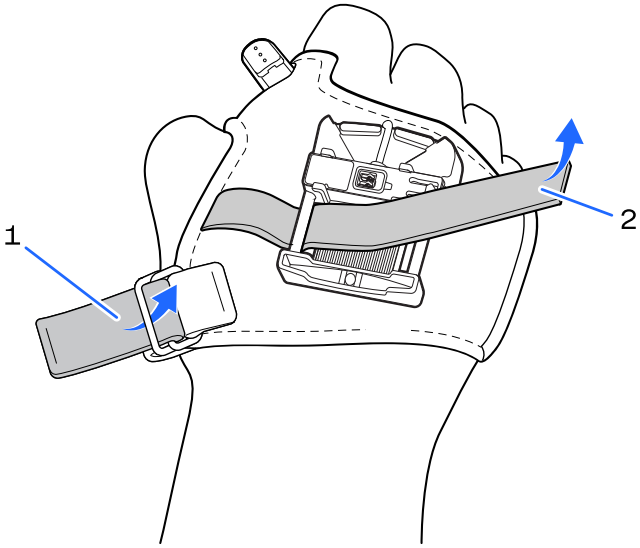
1. To detach the device in the shell from the BOH mount:
   a) Press the BOH mount button (2) and then slide the device in the shell (1) to the left.



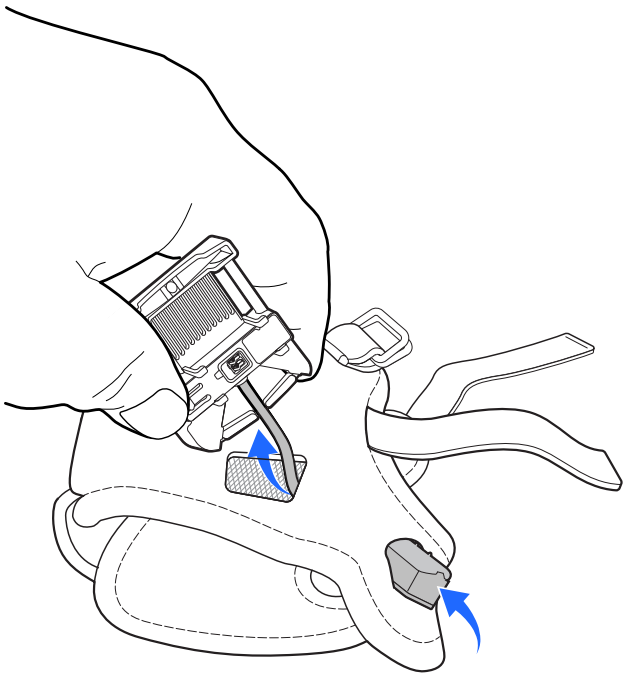
   b) Lift the device in the shell off the BOH mount.



2. Unfasten the strap (2) securing the BOH mount.



3. Unfasten the hand mount strap (1) and then slide your hand out from the hand wrap.
4. Remove the finger trigger button and cable from the hand wrap.



Application Deployment

This section provides steps on device security, app development, and app management. It also provides instructions for installing apps and updating the device software.

NOTE: Ensure that the date is set correctly before installing certificates or when accessing secure websites.

Android Security

The device implements a set of security policies that determine whether an application is allowed to run and, if allowed, with what level of trust. To develop an application, you must know the security configuration of the device and how to sign an application with the appropriate certificate to allow the application to run (and to run with the needed level of trust).

NOTE: Ensure the date is set correctly before installing certificates or when accessing secure websites.

Secure Certificates

If the VPN or Wi-Fi networks rely on secure certificates, obtain the certificates and store them in the device's secure credential storage before configuring access to the VPN or Wi-Fi networks.

If downloading the certificates from a website, set a password for the credential storage. The device supports X.509 certificates saved in PKCS#12 key store files with a .p12 extension (if key store has a .pfx or other extension, change to .p12).

The device also installs any accompanying private key or certificate authority certificates contained in the key store.

Installing a Secure Certificate

If required by the VPN or Wi-Fi network, install a secure certificate on the device.

1. Copy the certificate from the host computer to the root of the device's internal memory.
2. Go to **Settings**.
3. Touch **Security** > **More security settings** > **Encryption & credentials**.
4. Touch **Install a certificate**.
5. Navigate to the location of the certificate file.
6. Touch the filename of the certificate to install.

7. If prompted, enter the password for credential storage and touch **OK**.

   If a password has not been set for the credential storage, enter a password for it twice, and then touch **OK**.

8. Enter a name for the certificate, and in the **Credential use** drop-down menu, select **VPN and apps** or **Wi-Fi**.
9. Touch **OK**.

The certificate can now be used when connecting to a secure network. For security, the certificate is deleted from the internal memory.

Configuring Credential Storage Settings

Configure credential storage from the device settings.

1. Go to **Settings**.
2. Touch **Security** > **More security settings**.
3. Touch **Encryption & credentials**.
4. Select an option.
   - Touch **Trusted credentials** to display the trusted system credentials.
   - Touch **User credentials** to display user credentials.
   - Touch **Install a certificate** to install a secure certificate from storage.
   - Touch **Clear credentials** to delete all secure certificates and related credentials.

Android Development Tools

Development tools for Android include Android Studio, EMDK for Android, and StageNow.

Android Development Workstation

Android development tools are available at developer.android.com.

To start developing applications for the device, download Android Studio. Development can take place on a Microsoft® Windows®, Mac® OS X®, or Linux® operating system.

Applications are written in Java or Kotlin, but compiled and executed in the Dalvik virtual machine. After the Java code is compiled cleanly, the developer tools make sure the application is packaged properly, including the AndroidManifest.xml file.

Android Studio contains a full featured IDE as well as SDK components required to develop Android applications.

Enabling Developer Options

The **Developer options** screen sets development-related settings. By default, the Developer Options are hidden.

1. Go to **Settings**.
2. Touch **About phone**.
3. Scroll down to **Build number**.

4. Tap **Build number** seven times.

   The message **You are now a developer!** displays.

5. Touch **Back**.
6. Touch **System > Developer options**.
7. Slide the **USB debugging** switch to the **ON** position.

EMDK for Android

EMDK for Android provides developers with tools to create business applications for enterprise mobile devices. It is designed for use with Google's Android Studio and includes Android class libraries such as Barcode, sample applications with source code, and the associated documentation.

EMDK for Android allows applications to take full advantage of the capabilities that Zebra devices have to offer. It embeds Profile Manager technology within Android Studio IDE, providing a GUI-based development tool designed specifically for Zebra devices. This allows fewer lines of code, resulting in reduced development time, effort, and errors.

For more information, go to techdocs.zebra.com/emdk-for-android/about/.

StageNow for Android

StageNow is Zebra's next-generation Android Staging Solution built on the MX platform. It allows quick and easy creation of device profiles and can deploy to devices simply by scanning a barcode or reading a tag.

The StageNow Staging Solution includes the following components:

- The StageNow Workstation tool installs on the staging workstation (host computer) and lets the administrator easily create staging profiles for configuring device components, and perform other staging actions such as checking the condition of a target device to determine suitability for software upgrades or other activities. The StageNow Workstation stores profiles and other created content for later use.
- The StageNow Client resides on the device and provides a user interface for the staging operator to initiate staging. The operator uses one or more of the desired staging methods (print and scan a barcode or read an NFC tag) to deliver staging material to the device.

For more information, go to techdocs.zebra.com/stagenow/.

ADB USB Setup

To use the Android Debug Bridge (ADB), install the development SDK on the host computer then install the ADB and USB drivers.

Before installing the USB driver, make sure that the development SDK is installed on the host computer. Go to developer.android.com/sdk/index.html for details on setting up the development SDK.

The ADB and USB drivers for Windows and Linux are available on the Zebra Support Central website at zebra.com/support. Download the ADB and USB Driver Setup package. Follow the instructions with the package to install the ADB and USB drivers for Windows and Linux.

Enabling USB Debugging

By default, USB debugging is disabled.

1. Go to **Settings**.
2. Touch **About phone**.
3. Scroll down to **Build number**.
4. Tap **Build number** seven times.

   The message **You are now a developer!** displays.
5. Touch **Back**.
6. Touch **System > Developer options**.
7. Slide the **USB debugging** switch to the **ON** position.
8. Touch **OK**.
9. Connect the device to the host computer using the USB Cable.

   The **Allow USB debugging?** dialog box displays on the device.

   If the device and host computer are connected for the first time, the **Allow USB debugging?** dialog box with the **Always allow from this computer** check box displays. Select the check box, if required.
10. Touch **OK** or **Allow**.
11. On the host computer, navigate to the **platform-tools** folder and open a command prompt window.
12. Type `adb devices`.

    The following displays:

```
List of devices attached          XXXXXXXXXXXXXXX device
```

    Where XXXXXXXXXXXXXXX is the device number.

NOTE: If device number does not appear, ensure that ADB drivers are installed properly.

13. Return to the Home screen.

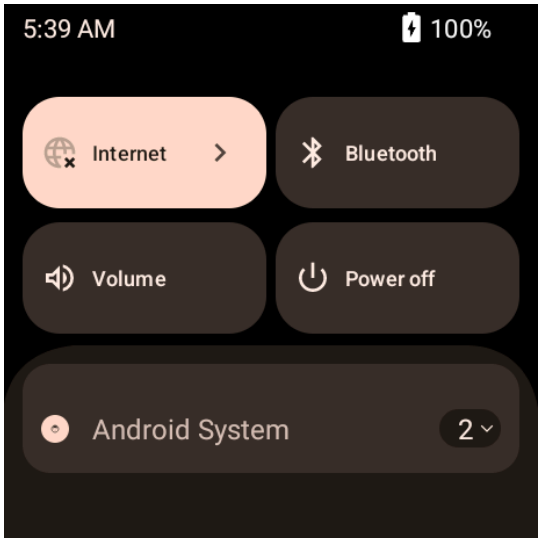
Entering Android Recovery Manually

Many of the update methods discussed in this section require putting the device into Android Recovery mode. If you are unable to enter Android Recovery mode through adb commands, use the following steps to manually enter Android Recovery mode.

IMPORTANT: Connect the device to the USB cable prior to performing the following steps to enter Android Recovery mode.

NOTE: When the device connecting with the USB cable reboots, press the volume down button to enter Fastboot mode.

1. On the Quick Access panel, press and hold the **Power off** icon until the menu displays.



2. Press **Restart**.
3. Press and hold the back button until the Zebra logo displays, and then release the button.

   The System Recovery screen displays.

Application Installation Methods

After an application is developed, install the application onto the device using one of the supported methods.

NOTE: To ensure the stable operation of the device, the recommended maximum memory utilization for the device should be kept below 350 MB for total user applications. This includes Enterprise Mobility Management (EMM).

- Android Debug Bridge
- Wireless Android Debug Bridge
- Mobile device management (MDM) platforms that have application provisioning. Refer to the MDM software documentation for details.

Installing Applications Using the Android Debug Bridge

Use ADB commands to install applications onto the device.

1. Ensure that the ADB drivers are installed on the host computer.
2. Connect the device to a host computer using the USB-C cable.

   When transferring files or debugging, ensure only one USB connection to the device exists. For example, do not dock the device or attach an expansion back if using a USB cable.
3. Go to **Settings**.
4. Touch **System** > **Developer options**.
5. Slide the **USB debugging** switch to the **ON** position.
6. Touch **OK**.

7. If the device and host computer are connected for the first time, the **Allow USB debugging?** dialog box with the **Always allow from this computer** check box displays. Select the check box, if required.
8. Touch **OK** or **Allow**.
9. On the host computer, navigate to the **platform-tools** folder and open a command prompt window.
10. Type `adb install <application>`.

    where: `<application>` = the path and filename of the apk file.
11. Disconnect the USB-C cable from the device.

Installing Applications Using Wireless ADB

Use ADB commands to install an application onto the device.

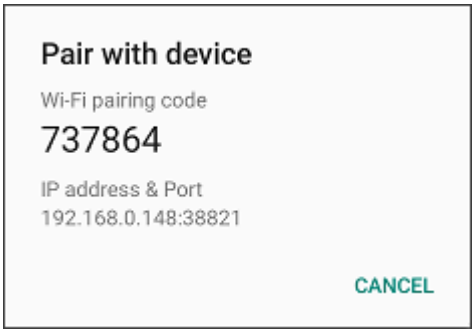
Go to the Zebra Support & Downloads web site at zebra.com/support and download the appropriate Factory Reset file to a host computer.

IMPORTANT: Ensure the latest adb files are installed on the host computer.

IMPORTANT: The device and host computer must be on the same wireless network.

1. Go to **Settings**.
2. Touch **System > Developer options**.
3. Slide the **USB debugging** switch to the **ON** position.
4. Slide the **Wireless debugging** switch to the **ON** position.
5. If the device and host computer are connected for the first time, the **Allow wireless debugging on this network?** dialog box with the **Always allow from this network** check box displays. Select the check box, if required.
6. Touch **ALLOW**.
7. Touch **Wireless debugging**.
8. Touch **Pair with pairing code**.

   The **Pair with device** dialog box displays.



9. On the host computer, navigate to the **platform-tools** folder and open a command prompt window.
10. Type `adb pair XX.XX.XX.XX.XXXXX`.

    where XX.XX.XX.XX:XXXXX is the IP address and port number from the **Pair with device** dialog box.

11. Press **Enter**.
12. Type the pairing code from the **Pair with device** dialog box.
13. Press **Enter**.
14. Type `adb connect XX.XX.XX.XX:XXXXX`.

    where XX.XX.XX.XX:XXXX is the **IP address & Port** on the **Wireless debugging** screen.

    The device is now connected to the host computer.
15. Type `adb devices`.

    The following displays:

```
List of devices attached          XXXXXXXXXXXXXXX device
```

    Where XXXXXXXXXXXXXXX is the device number.

NOTE: If device number does not appear, ensure that ADB drivers are installed properly.

16. On the host computer command prompt window type:

```
adb install <application>
```

17. On the host computer, type:

    `adb disconnect`.

Uninstalling an Application

Free up device memory by removing unused apps.

1. Go to **Settings**.
2. Touch **Apps**.
3. Touch **See all apps** to view all apps in the list.
4. Scroll through the list to the app.
5. Touch the app.

   The **App info** screen displays.
6. Touch **Uninstall**.
7. Touch **OK** to confirm.

Android System Update

System Update packages can contain either partial or complete updates for the operating system. Zebra distributes the System Update packages on the Zebra Support & Downloads website. Perform a system update using ADB.

Performing a System Update Using ADB

Use ADB to perform a system update.

Go to the Zebra Support & Downloads web site at zebra.com/support and download the appropriate System Update package to a host computer.

1. Connect the device to a host computer using a USB cable.
2. Press and hold the **Power off** icon.
3. Touch **Restart**.
4. Press and hold the left button until the Zebra logo displays.
5. Release the left button and the **Recovery** screen displays.
6. Use the right button to navigate the menu.
7. Press and hold the right button to select **Apply upgrade from ADB**.
8. On the host computer command prompt window type `adb sideload <file>`.where: <file> = the path and filename of the zip file.
9. Press **Enter**.

   The System Update installs (progress displays as a percentage in the Command Prompt window) and then the System Recovery screen displays on the device.
10. Use the right button to navigate to **Reboot system now**.
11. Press and hold the right button to reboot the device.

If you are not able to enter Android Recovery mode through the adb command, Go to Entering Android Recovery Manually.

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Verifying System Update Installation

Verify that the system update was successful.

1. Go to **Settings**.
2. Touch **About phone**.
3. Scroll down to **Build number**.
4. Ensure that the build number matches the new system update package file number.

Android Enterprise Reset

An Enterprise Reset erases all user data in the /data partition, including data in the primary storage locations (emulated storage), while preserving the contents of the /enterprise folder and its subfolders. Zebra distributes the Enterprise Reset packages on the Zebra Support & Downloads website.

Before performing an Enterprise Reset, provision all necessary configuration files and restore after the reset.

Performing an Enterprise Reset From Device Settings

Perform an Enterprise Reset from the device settings.

1. Go to **Settings**.
2. Touch **System > Reset Options > Erase all data (factory reset).**
3. Touch **Erase all data** twice to confirm the Enterprise Reset.

Performing an Enterprise Reset Using ADB

Perform an Enterprise Reset Using ADB

Go to the Zebra Support & Downloads web site at zebra.com/support and download the appropriate Enterprise Reset file to a host computer.

1. Connect the device to a host computer using a USB cable.
2. Press and hold the **Power off** icon.
3. Touch **Restart**.
4. Press and hold the left button until the Zebra logo displays.
5. Release the left button and the **Recovery** screen displays.
6. Use the right button to navigate the menu.
7. Press and hold the right button to select **Apply upgrade from ADB**.
8. On the host computer command prompt window type `adb sideload <file>`.where: <file> = the path and filename of the zip file.
9. Press **Enter**.

   The System Update installs (progress displays as a percentage in the Command Prompt window) and then the System Recovery screen displays on the device.
10. Use the right button to navigate to **Reboot system now**.
11. Press and hold the right button to reboot the device.

If you are not able to enter Android Recovery mode through the adb command, go to Entering Android Recovery Manually.

Android Factory Reset

A Factory Reset erases all data in the /data and /enterprise partitions in internal storage and clears all device settings. A Factory Reset returns the device to the last installed operating system image. To revert to a previous operating system version, re-install that operating system image. Zebra distributes the Factory Reset packages on the Zebra Support & Downloads website.

Performing a Factory Reset Using ADB

Perform a Factory Reset using ADB

Go to the Zebra Support & Downloads web site at zebra.com/support and download the appropriate Factory Reset file to a host computer.

1. Connect the device to a host computer using a USB cable.
2. Press and hold the **Power off** icon.
3. Touch **Restart**.
4. Press and hold the left button until the Zebra logo displays.
5. Release the left button and the **Recovery** screen displays.
6. Use the right button to navigate the menu.
7. Press and hold the right button to select **Apply upgrade from ADB**.
8. On the host computer command prompt window type `adb sideload <file>`.where: <file> = the path and filename of the zip file.
9. Press **Enter**.

   The System Update installs (progress displays as a percentage in the Command Prompt window) and then the System Recovery screen displays on the device.
10. Use the right button to navigate to **Reboot system now**.
11. Press and hold the right button to reboot the device.

If you are not able to enter Android Recovery mode through the adb command, go to Entering Android Recovery Manually.

Android Storage

The device contains multiple types of file storage.

- Random Access Memory (RAM)
- Enterprise folder

Random Access Memory

Executing programs use RAM to store data. Data stored in RAM is lost upon a reset.

The operating system manages how applications use RAM. It only allows applications and component processes and services to use RAM when required. It may cache recently used processes in RAM, so they restart more quickly when opened again, but it will erase the cache if it needs the RAM for new activities.

The screen displays the amount of used and free RAM.

- **Performance** - Indicates memory performance.
- **Total memory** - Indicates the total amount of RAM available.
- **Average used (%)** - Indicates the average amount of memory (as a percentage) used during the period of time selected (default - 3 hours).
- **Free** - Indicates the total amount of unused RAM.

- **Memory used by apps** - Touch to view RAM usage by individual apps.

Viewing Memory

View the amount of memory used and free RAM.

Complete Enabling Developer Options before you continue:

1. Go to **Settings**.
2. Touch **System** > **Developer options**.
3. Touch **Memory**.

Enterprise Folder

The Enterprise folder (within internal flash) is a super-persistent storage that is persistent after a reset and an Enterprise Reset.

The Enterprise folder is erased during a Factory Reset. The Enterprise folder is used for deployment and device-unique data. The Enterprise folder is approximately 256 MB (formatted). Applications can persist data after an Enterprise Reset by saving data to the enterprise/user folder. The folder is ext4 formatted and is only accessible from a host computer using ADB or from an MDM.

Managing Apps

Apps use two kinds of memory: storage memory and RAM. Apps use storage memory for themselves and any files, settings, and other data they use. They also use RAM when they are running.

1. Go to **Settings**.
2. Touch **Apps**.
3. Touch **See all apps** to view all apps on the device.
4. Touch ⋮ > **Show system** to include system processes in the list.
5. Touch an app, process, or service in the list to open a screen with details about it and, depending on the item, to change its settings, permissions, notifications and to force stop or uninstall it.

App Details

Apps have different kinds of information and controls.

- **Force stop** - Stop an app.
- **Disable** - Disable an app.
- **Uninstall** - Remove the app and all of its data and settings from the device.
- **Notifications** - Set the app notification settings.
- **Permissions** - Lists the areas on the device that the app has access to.
- **Storage & cache** - Lists how much information is stored and includes buttons for clearing it.
- **Mobile data & Wi-Fi** - Provides information about data consumed by an app.
- **Mobile data & Wi-Fi** - Provides information about data consumed by an app. Mobile data not supported.

- **Advanced:**
  - **Screen time** - Displays the amount of time the app has displayed on the screen.
  - **Battery** - Lists the amount of computing power used by the app.
  - **Open by default** - If you have configured an app to launch certain file types by default, you can clear that setting here.
  - **Display over other apps** - Allows an app to display on top of other apps.
  - **App details** - Provides a link to additional app details on the Play store.
  - **Additional settings in the app** - Opens settings in the app.
  - **Modify system settings** - Allows an app to modify the system settings.

Managing Downloads

Files and apps downloaded using the Browser or Email are stored on the Internal storage in the Download directory. Use the Downloads app to view, open, or delete downloaded items.

1. Swipe the screen up and touch .
2. Touch > **Downloads**.
3. Touch and hold an item to delete, and then touch .

   The item is deleted from the device.

Maintenance and Troubleshooting

This section explains how to maintain and troubleshoot the device and accessories.

Maintaining the Device

Follow these guidelines to maintain the device properly.

For trouble-free service, observe the following tips when using the device:

- To avoid scratching the screen, never use an actual pen, pencil, or other sharp object on the surface of the device screen.
- The device's touch-sensitive screen is made of glass. Do not drop the device or subject it to strong impact.
- Protect the device from temperature extremes. Do not leave it on the dashboard of a car on a hot day, and keep it away from heat sources.
- Do not store the device in any dusty, damp, or wet location.
- Use a soft lens cloth to clean the device. If the surface of the device screen becomes soiled, clean it with a soft cloth moistened with an approved cleanser.
- Periodically replace the rechargeable battery to ensure maximum battery life and product performance. Battery life depends on individual usage patterns.
- A screen protector is applied to the device. Zebra recommends using a screen protector to minimize wear and tear. Screen protectors enhance the usability and durability of touchscreen displays. Benefits include:
  - Protection from scratches and gouges
  - Durable touch surface with tactile feel
  - Abrasion and chemical resistance
  - Glare reduction
  - Keeping the device's screen looking new
  - Quick and easy installation.
- Periodically inspect accessory cables and connectors. Check the inside and outside of cradles to ensure good electrical contact.

Battery Safety Guidelines

To use the device safely, you must follow the battery guidelines.

- The area in which the units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken where the device is charged in a non-commercial environment.
- Follow battery usage, storage, and charging guidelines found in this guide.
- Improper battery use may result in a fire, explosion, or other hazard.
- To charge the mobile device battery, the ambient battery and charger temperatures must be between 0°C to 40°C (32°F to 104°F).
- Do not use incompatible batteries and chargers, including non-Zebra batteries and chargers. Use of an incompatible battery or charger may present a risk of fire, explosion, leakage, or other hazard. If you have any questions about the compatibility of a battery or a charger, contact the Global Customer Support Center.
- For devices that utilize a USB port as a charging source, the device shall only be connected to products that bear the USB-IF logo or have completed the USB-IF compliance program.
- To enable authentication of an approved battery, as required by IEEE1725 clause 10.2.1, all batteries will carry a hologram. Do not fit any battery without checking it has the authentication hologram.
- Do not disassemble or open, crush, bend or deform, puncture, or shred the battery.
- Severe impact from dropping any battery-operated device on a hard surface could cause the battery to overheat.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
- Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer.
- Battery usage by children should be supervised.
- Please follow local regulations to properly dispose of used rechargeable batteries.
- Do not dispose of batteries in fire.
- Seek medical advice immediately if a battery has been swallowed.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with water for 15 minutes, and seek medical advice.
- If you suspect damage to your equipment or battery, contact Customer Support to arrange for inspection.

Ergonomic Recommendations

To avoid or minimize risk of ergonomic injury, follow the ergonomic recommendations.

- Ensure users are trained in proper and secure mounting of the device on their fingers.
- Ensure that the finger comfort pad is in place and the strap buckle is used to properly secure the device to your fingers.
- Ensure that the device is mounted so that the display is oriented towards you.

- Maintain and clean wearable components such as straps and soft goods.
- Reduce or eliminate unnecessary repetitive motion and activation.
- Maintain a neutral posture.
- Reduce or eliminate elevated or raised arm and shoulder postures.
- Reduce or eliminate excessive force.
- Keep objects that are used frequently within easy reach.
- Perform tasks at correct heights.
- Reduce or eliminate direct pressure.
- Provide adequate clearance.
- Provide a suitable working environment.
- Improve working procedures using the device.

Best Practices for Enterprise Mobile Devices Operating in Hot Environments and Direct Sunlight

Exceeding the operating temperature by external hot environments will cause the device's thermal sensor to notify the user of a shut down the device until the device's temperature returns to the operational temperature range.

- Avoid direct sunlight to the device - The easiest way to prevent overheating is to keep the device out of direct sunlight. The device absorbs sunlight and heat and retains them, getting hotter the longer it remains in sunlight and heat.
- Avoid leaving the device in a vehicle on a hot day or hot surface - Similar to leaving the device out in direct sunlight, the device will also absorb the thermal energy from a hot surface or when left on the dashboard of a vehicle or seat, getting warmer the longer it remains on the hot surface or inside the hot vehicle.
- Turn off unused apps on the device. Open, unused apps running in the background can make the device to work harder, which may cause it to heat up. This will also improve your mobile device's battery life.
- Avoid turning your screen brightness up - Just the same as running background apps, turning your brightness up will force your battery to work harder and create more heat. Minimizing your screen brightness may extend the time you can use the mobile computer device in hot environments.

Cleaning Instructions

This section provides instructions for cleaning the device.

Use caution and avoid damaging the device when using cleaning materials.

CAUTION: Always wear eye protection. Read the warning label on alcohol product before using. If you have to use any other solution for medical reasons please contact the Global Customer Support Center for more information.

WARNING: Avoid exposing this product to contact with hot oil or other flammable liquids. If such exposure occurs, unplug the device and clean the product immediately in accordance with these guidelines.

Approved Cleanser Active Ingredients

This section lists the approved cleaning agents.

100% of the active ingredients in any cleaner must consist of one or some combination of the following: isopropyl alcohol, ammonium chloride, or mild dish soap.

IMPORTANT: Use pre-moistened wipes and do not allow liquid cleaner to pool.

Approved cleaners include:

- Purell Ethanol Wipes
- 409 Glass Cleaner
- Windex Blue

Harmful Ingredients

This section lists specific chemicals that you must avoid.

The following chemicals are known to damage the plastics on the device and should not come in contact with the device: acetone; ketones; ethers; aromatic and chlorinated hydrocarbons; aqueous or alcoholic alkaline solutions; ethanolamine; toluene; trichloroethylene; benzene; carbolic acid and TB-lysoform.

Many vinyl gloves contain phthalate additives, which are often not recommended for medical use and are known to be harmful to the housing of the device.

Device Cleaning Instructions

Do not apply liquid directly to the device. Dampen a soft cloth or use pre-moistened wipes. Do not wrap the device in the cloth or wipe, instead gently wipe the unit. Before use, allow the unit to air dry.

NOTE: For thorough cleaning, it is recommended to first remove all accessory attachments, such as hand straps or cradle cups from the mobile device and to clean them separately.

Special Cleaning Notes

This section describes essential handling precautions.

Do not handle the device while wearing vinyl gloves containing phthalates. Remove vinyl gloves and wash hands to eliminate any residue left from the gloves.

If products containing any of the harmful ingredients listed above are used prior to handling the device, such as a hand sanitizer that contains ethanolamine, hands must be completely dry before handling the device to prevent damage to the device.

IMPORTANT: If the battery connectors are exposed to cleaning agents, thoroughly wipe off as much of the chemical as possible and clean with an alcohol wipe. It is also recommended to install the battery in the terminal prior to cleaning and disinfecting the device to help minimize buildup on the connectors. When using cleaning/disinfectant agents on the device, it is important to follow the directions prescribed by the cleaning/disinfectant agent manufacturer.

Cleaning Materials Required

This section lists the necessary cleaning materials.

- Alcohol wipes with 70% isopropyl alcohol
- Lens tissue
- Cotton-tipped applicators
- 70% Isopropyl alcohol
- Can of compressed air for electronics with a dispenser tube

Cleaning Frequency

This section explains how often you must clean the device.

The cleaning frequency is at the customer's discretion due to the varied environments in which the mobile devices are used and may be cleaned as frequently as required. When dirt is visible, it is recommended to clean the mobile device to avoid the build-up of particles, which makes the device more difficult to clean later on.

For consistency and optimum image capture, it is recommended to clean the camera window periodically especially when used in environments prone to dirt or dust.

Cleaning the Device

This section describes how to clean the housing and battery of the device.

For more information on cleaning the device connector, refer to Cleaning the Connectors.

Housing

Thoroughly wipe the housing, including all buttons and triggers, using an approved alcohol wipe.

Display

The display can be wiped down with an approved alcohol wipe, but care should be taken not to allow any pooling of liquid around the edges of the display. Immediately dry the display with a soft, non-abrasive cloth to prevent streaking.

Camera and Exit Window

Wipe the camera and exit the window periodically with lens tissue or other material suitable for cleaning optical material such as eyeglasses.

Cleaning Battery Connectors

This section provides instructions on how to clean the battery and terminal connectors.

1. Remove the main battery from the mobile computer.
2. Dip the cotton portion of the cotton-tipped applicator in isopropyl alcohol.

3. To remove any grease or dirt, rub the cotton portion of the cotton-tipped applicator back and forth across the connectors on the battery and terminal sides. Do not leave any cotton residue on the connectors.
4. Repeat at least three times.
5. Use a dry cotton-tipped applicator and repeat steps 3 and 4. Do not leave any cotton residue on the connectors.
6. Inspect the area for any grease or dirt and repeat the cleaning process if necessary.

CAUTION: After cleaning the battery connectors with bleach-based chemicals, follow the Battery Connector Cleaning instructions to remove bleach from the connectors.

Cleaning Cradle Connectors

This section provides instructions on how to clean the cradle connectors.

1. Remove the DC power cable from the cradle.
2. Dip the cotton portion of the cotton-tipped applicator in isopropyl alcohol.
3. Rub the cotton portion of the cotton-tipped applicator along the pins of the connector. Slowly move the applicator back and forth from one side of the connector to the other. Do not leave any cotton residue on the connector.
4. All sides of the connector should also be rubbed with the cotton-tipped applicator.
5. Remove any lint left by the cotton-tipped applicator.
6. If grease and other dirt can be found on other areas of the cradle, use a lint-free cloth and alcohol to remove.
7. Allow at least 10 to 30 minutes (depending on ambient temperature and humidity) for the alcohol to air dry before applying power to cradle.

   If the temperature is low and humidity is high, longer drying time is required. Warm temperature and low humidity requires less drying time.

CAUTION: After cleaning the cradle connectors with bleach-based chemicals, follow the Cleaning Cradle Connectors instructions to remove bleach from the connectors.

Troubleshooting

In rare circumstances, to troubleshoot the device, you may need to reset the device.

Resetting the Device

This section describes options to reset the device.

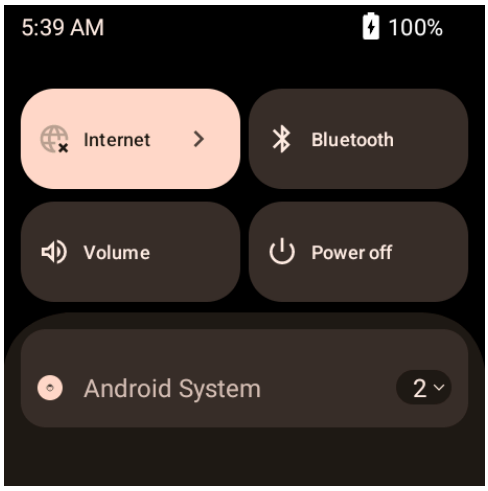
There are four reset functions:

- Soft reset
- Hard reset
- Enterprise reset.
- Factory reset.

Performing a Soft Reset

Perform a soft reset if applications stop responding.

1. On the Quick Access panel, press and hold the **Power off** icon until the menu displays.



2. Touch **Restart**.

   The device reboots.

Performing a Hard Reset

Perform a hard reset if the device stops responding.

1. Press and hold both the back and home buttons.
2. When the screen turns off, release the buttons.

   The device reboots.

Troubleshooting the Device

Table 11 Troubleshooting the Device

Problem	Cause	Solution
Device does not turn on.	Battery not charged.	Charge or replace the battery in the device.
	Battery not installed properly.	Ensure battery is installed properly.
	System crash.	Perform a soft reset. If the device still does not turn on, perform a hard reset.
Battery did not charge.	Battery failed.	Replace battery. If the device still does not operate, try a soft reset, then a hard reset.
	Device removed from cradle before charging completed.	Insert the device into the cradle and begin charging. The battery fully charges in approximately 3 hours (from 0 to 90%).
	Extreme battery temperature.	The battery and charger temperatures must be between 0°C and 40°C (32°F and 104°F).

Table 11 Troubleshooting the Device (Continued)

Problem	Cause	Solution
During data communication, no data was transmitted, or transmitted data was incomplete.	Device unplugged from host computer during communication.	Reconnect the programming cable to the host computer and re-transmit.
	Communication software was incorrectly installed or configured.	See system administrator.
During data communication over Wi-Fi, no data transmitted, or transmitted data was incomplete.	Wi-Fi radio is not on.	Turn on the Wi-Fi radio.
	You moved out of range of an access point.	Move closer to an access point.
Device turns itself off.	Device is inactive.	The device turns off after a period of inactivity. If the device is running on battery power, this period can be set to 15 seconds, 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes, or 30 minutes. Change the setting if you need a longer delay before the automatic shutoff feature activates.
	Battery is depleted.	Place the device in the cradle to re-charge the battery. Replace the battery.
	Battery is not inserted properly.	Insert the battery properly.
	The devices' battery is low and it powers down to protect memory content.	Place the device in the cradle to re-charge the battery.
No sound	Volume setting is low or turned off.	Adjust the volume.
Tapping the window buttons or icons does not activate the corresponding feature.	The device is not responding.	Reboot the device.
The device does not decode a barcode.	Unreadable barcode.	Ensure the symbol is not defaced.
	Distance between exit window and barcode is incorrect.	Move the device closer or further from the barcode to the proper scanning range.
	Device is not programmed for the barcode.	Verify that the device can read the type of barcode being scanned. Ensure that the barcode parameters are set properly for the barcode being scanned.
	Device is not programmed to generate a beep.	Verify that a beep on a good decode is used.

2-Slot Charge-Only Cradle

Table 12 Troubleshooting the 2-Slot Charge-Only Cradle

Symptom	Possible Cause	Action
Battery is not charging.	Device removed from the cradle too soon.	Replace the device in the cradle. The standard or high-capacity battery in device charges from fully depleted to 90% in approximately 3 hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	Device is not inserted correctly in the cradle.	Remove and re-insert the device into the cradle, ensuring it is firmly seated.
	Ambient temperature of the cradle is too warm.	Move the cradle to an area where the ambient temperature is between 0°C and 40°C (32°F and 104°F).
LEDs do not light when device is inserted.	Cradle is not receiving power.	Ensure the power cable is connected securely to both the cradle and to AC power.
	Device is not seated firmly in the cradle.	Remove and re-insert the device into the cradle, ensuring it is firmly seated.

10-Slot Charge-Only Cradle

Table 13 Troubleshooting the 10-Slot Charge-Only Cradle

Symptom	Possible Cause	Action
Battery is not charging.	Device removed from the cradle too soon.	Replace the device in the cradle. The standard or high-capacity battery in device charges from fully depleted to 90% in approximately 3 hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	Device is not inserted correctly in the cradle.	Remove and re-insert the device into the cradle, ensuring it is firmly seated.
	Ambient temperature of the cradle is too warm.	Move the cradle to an area where the ambient temperature is between 2°C and 40°C (35.6°F and 104°F).
LEDs do not light when device is inserted.	Cradle is not receiving power.	Ensure the power cable is connected securely to both the cradle and to AC power.
	Device is not seated firmly in the cradle.	Remove and re-insert the device into the cradle, ensuring it is firmly seated.

4-Slot Battery Charger

Table 14 Troubleshooting the 4-Slot Battery Charger

Symptom	Possible Cause	Action
Spare Battery not charging.	Charger is not receiving power.	Ensure the power cable is connected securely to both the charger and to AC power.
	Spare battery is not correctly seated.	Remove and re-insert the battery into the battery adapter, ensuring it is correctly seated.
	Battery adapter is not seated properly.	Remove and re-insert the battery adapter into the charger, ensuring it is correctly seated.
	Battery was removed from the charger or charger was unplugged from AC power too soon.	Ensure charger is receiving power. Ensure the spare battery is seated correctly. The standard or high-capacity spare battery charges from fully depleted to 90% in approximately 3 hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	Ambient temperature of the cradle is too warm.	Move the cradle to an area where the ambient temperature is between 0°C and 40°C (32°F and 104°F).
Spare Battery Charging LED does not light when spare battery is inserted.	Spare battery is not correctly seated.	Remove and re-insert the spare battery into the charging slot, ensuring it is correctly seated.

20-Slot Battery Charger

Table 15 Troubleshooting the 20-Slot Battery Charger

Symptom	Possible Cause	Action
Spare Battery not charging.	Charger is not receiving power.	Ensure the power cable is connected securely to both the charger and to AC power.
	Spare battery is not correctly seated.	Remove and re-insert the battery into the battery adapter, ensuring it is correctly seated.
	Battery adapter is not seated properly.	Remove and re-insert the battery adapter into the charger, ensuring it is correctly seated.
	Battery was removed from the charger or charger was unplugged from AC power too soon.	Ensure charger is receiving power. Ensure the spare battery is seated correctly. The standard or high-capacity spare battery charges from fully depleted to 90% in approximately 3 hours.
	Battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	Ambient temperature of the cradle is too warm.	Move the cradle to an area where the ambient temperature is between 0°C and 40°C (32°F and 104°F).

Table 15 Troubleshooting the 20-Slot Battery Charger (Continued)

Symptom	Possible Cause	Action
Spare Battery Charging LED does not light when spare battery is inserted.	Spare battery is not correctly seated.	Remove and re-insert the spare battery into the charging slot, ensuring it is correctly seated.

Technical Specifications

For device technical specifications, go to zebra.com/support.

SR560 Decode Distances

The following table provides the decode distances for the SR560 scan engine.

Table 16 SR560 Typical Decode Ranges

Barcode Type	Near Distance (cm / in)	Far Distance (cm / in)
3 mil Code 39	6.1 cm (2.4 in)	17.3 cm (6.8 in)
5 mil Code 128	4.8 cm (1.9 in)	10.1 cm (25.7 in)
5 mil Code 39	4.4 cm (1.7 in)	28.6 cm (11.3 in)
5 mil PDF417	7.1 cm (2.8 in)	20.3 cm (8.0 in)
6.67 mil PDF417	5.6 cm (2.2 in)	26.2 cm (10.3 in)
10 mil Data Matrix	4.6 cm (1.8 in)	31.5 cm (12.4 in)
100% UPCA	3.8 cm (1.5 in)	65.3 cm (25.7 in)
15 mil Code 128	6.4 cm (2.5 in)	74.2 cm (29.2 in)
20.0 mil Code 39	5.1 cm (2.0 in)	102.6 cm (40.4 in)
20.0 mil QR Code	5.3 cm (2.1 in)	49.3 cm (19.4 in)
Note: Decode performance is dependent on print quality, including resolution, contrast, and ambient lighting conditions.		

I/O Connector Pin-Outs

Describes the pin-outs for the I/O connector.

CAUTION: The interface connector at the bottom of the device is not removable. Trying to remove the connector will cause damage to the device and can void warranty.

Figure 29 I/O Connector

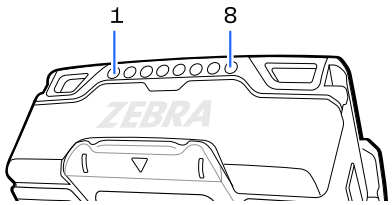


Table 17 I/O Connector Pin-Outs

Pin	Signal	Description
1	GND	Ground
2	CC	Micro USB A/B Configuration Channel
3	POWER IN	DC Power input
4	RSVD GPIO	Unused
5	VBUS	USB power input (device)/output (host)
6	D+	USB Data +
7	D-	USB Data -
8	GND	Ground

2-Slot Charge-Only Cradle

Table 18 2-Slot Charge-Only Cradle Technical Specifications

Item	Description
Dimensions	Height: 117.3 mm (4.6 in.) Width: 97.5 mm (3.8 in.) Depth: 147.7 mm (5.8 in.)
Weight	0.48 kg (1.06 lbs.)
Input Voltage	12 VDC
Power Consumption	Up to 10 watts
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F) 85% relative humidity (RH) condensing
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing in the operating temperature range
Drop	76.2 cm (30.0 in.) drops to concrete at room temperature
Electrostatic Discharge (ESD)	+/- 20 kV air +/- 10 kV contact discharge

10-Slot Charge-Only Cradle

Table 19 10-Slot Charge-Only Cradle Technical Specifications

Item	Description
Dimensions	Height: 124.8 mm (4.9 in.) Width: 489.0 mm (19.3 in.) Depth: 147.7 mm (5.8 in.)
Weight	2.42 kg (5.35 lbs.)
Input Voltage	12 VDC
Power Consumption	Up to 50 watts
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F) 85% relative humidity (RH) condensing
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing in the operating temperature range
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 20 kV air +/- 10 kV contact discharge

4-Slot Battery Charger

Table 20 4-Slot Battery Charger Technical Specifications

Item	Description
Dimensions	Height: 101.7 mm (4.0 in.) Width: 97.5 mm (3.8 in.) Depth: 147.4 mm (5.8 in.)
Weight	0.33 kg (0.73 lbs.)
Input Voltage	12 VDC
Power Consumption	Up to 16 watts
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F) 85% relative humidity (RH) condensing
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing in the operating temperature range
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 20 kV air +/- 10 kV contact discharge

20-Slot Battery Charger

Table 21 20-Slot Battery Charger Technical Specifications

Item	Description
Dimensions	Height: 108.8 mm (4.28 in.) Width: 489.0 mm (19.3 in.) Depth: 147.4 mm (5.8 in.)
Weight	2.72 kg (6.00 lbs.)
Input Voltage	12 VDC
Power Consumption	Up to 80 watts
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F) 85% relative humidity (RH) condensing
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing in the operating temperature range
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature
Electrostatic Discharge (ESD)	+/- 20 kV air +/- 10 kV contact discharge

USB Charge Cable

Table 22 USB Charge Cable Technical Specifications

Item	Description
Length	50 mm
Weight	40 g
Input Voltage	5 VDC
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F) 85% relative humidity (RH) condensing
Charging Temperature	0°C to 40°C (32°F to 104°F)
Humidity	5% to 95% non-condensing in the operating temperature range
Drop	76.2 cm (30.0 in.) drops to vinyl tiled concrete at room temperature.
Electrostatic Discharge (ESD)	+/- 20 kV air +/- 10 kV contact +/- 10 kV indirect discharge

Antenna Cables

This table outlines color variations of the RFID antenna cables by region.

Table 23 UHG RFID Cable Color Variations

		Items	
		Cable - Gray (210 mm)	Cable - Black (240 mm)
Region	Connector	Cable/Connector	
EU	Gray	Gray/Gray Part number: CBL-WS5X-ANTR8S-01	Black/Gray Part number: CBL-WS5X-ANTR8S-01
NA	Black	Gray/Black Part number: CBL-WS5X-ANTR9S-01	Black/Black Part number: CBL-WS5X-ANTR9S-01