

WS Picking

User and Administration Guide

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About this Guide

The WS Picking application is a standalone client-server system for Zebra Wearable Series computers. This documentation describes the administrative and operational workflows to managing and fulfilling orders.

The content is organized by functional role:

- **Administrator management**—Oversight of users, products, orders, and server configurations through the web interface.
- **User operations**—Logging in to the application and order picking tasks performed directly on the wearable device.

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.

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.

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.

System Overview

The WS Picking application is a fully self-contained client-server system that shows a wearable computer picking workflow backed by a real database and real network communication.

Unlike smaller code snippets, this application provides a complete implementation intended to serve as a working reference. The application serves three purposes:

- Demonstrate what a task workflow looks like on a wearable computer, using focused single-step activity screens that work together to complete a larger task.
- Demonstrate how user login can be accomplished via a login station, reducing reliance on small-screen typing.
- Provide code that can be extracted or extended for real production use.

System Architecture

The WS Picking application consists of a server component and an Android client component that communicate over a shared network.

Server Component

The server component is a web server that provides web pages to manage a database of users, products, and orders and a remote login console, so users with Zebra WS devices can log in using a full-size workstation.

Client Component

The client component is an Android application that runs a picking workflow that:

- Enables login via a login station or direct credential entry on the device.
- Optimizes activity layouts for the 2-inch screen of Zebra WS devices.
- Processes orders via barcode scans or manual quantity entry for one order at a time.

Initial Database Contents

When the application is run for the first time, the server creates a database populated with hardcoded test data. Use the `admin` account with the password `zebra` to log in. Review the following default contents:

- All hardcoded user accounts, which share the same default password.
- A set of products with placeholder UPC codes.
- A set of sample orders.



NOTE: The default database contents are for testing purposes only. Replace all test data with production data before deploying the application.

Demonstration

Use the supplied debug executables to evaluate the WS Picking application before making production customizations.

The package includes a server JAR file and a client APK file that can be used directly for demonstration purposes.



IMPORTANT: The supplied executables are debug builds that deliberately bypass proper security protocol by relying on a built-in self-signed certificate for communication. Do not use these executables in a production environment.

Demonstration Requirements

Before running the demonstration, ensure:

- The server and client devices are on the same unrestricted subnet so that communication between them is not blocked by a firewall.
- The database has been updated with your own products and orders (via a web browser pointed at the server component) so you can test the picking workflow with real UPC labels.

Database Management

The server database resides in a single file, which simplifies management and enables several flexible options.

- Back up the database by copying the file to restore earlier versions for repeated demonstration scenarios.
- Maintain distinct database files for different purposes, each containing its own set of products and orders.
- Load a specific database file via a command-line option when starting the server.

Production Customization Overview

Prepare the WS Picking application for production use by addressing security certificates, server hardening, secure logging, database integration, networking resilience, and workflow modifications.

Security Certificates

The demonstration package uses a built-in self-signed certificate that bypasses proper security protocol. Before deploying the application to production, replace this certificate.

- Obtain a proper security certificate signed by a trusted certificate authority (CA).
- Ensure the certificate points to the server's verifiable hostname.

Server Hardening

Add security layers to protect the server from common attack vectors before production deployment.

- Implement Distributed Denial of Service (DDoS) attack mitigation.

- Add login credential attack protections, such as defenses against brute-force and credential-stuffing attacks.

Secure Logging and Error Handling



WARNING: This debug version captures sensitive data (such as order objects and server errors) within its failure logs to assist with testing. When building your production application, remove these logs and implement production-ready error handling.

Database Integration

Most companies already have databases containing business data, including user accounts, product details, and orders. You can adapt the WS Picking application to work with existing systems by:

- Adjusting the client app to work with existing systems instead of this server component, assuming suitable APIs exist.
- Adjusting the server component to interface with an existing data back end. Differences in the available data fields require corresponding changes to the code.



NOTE: The application uses an SQLite database, which is not production-ready. For example, SQLite stores all data in a single file. However, the code uses generic database access libraries, so you can modify it to work with a different database engine.

Networking Resilience

Make the client resilient to networking issues common in warehouse environments:

- Prevent the application from losing updates when the device goes out of network range by configuring it to retry updates when it restores connectivity.
- Implement automatic session reestablishment if the connection drops due to a timeout or server reset.

Workflow Modifications

Modify the picking workflow to suit specific operational requirements. Examples of possible modifications include configuring the application to pick multiple orders at a time to multiple bins.

Administration Features

Administrative features allow configuration and management of the WS Picking application and server.

Administrators interact with the WS Picking application through the server web interface. The web interface provides access to the following management areas:

- **Users**—Add, modify, and remove user accounts and assign roles.
- **Products**—Add, modify, and remove products in the picking database, including UPC codes and warehouse locations.
- **Orders**—Add, modify, and remove orders, including assigning pickers and setting priority.

The server also provides a remote login console that allows users with small Android devices, such as Zebra WS wearables, to authenticate using a full-size workstation rather than typing on a small screen.

Running the Picking Server

Start the WS Picking Application server from a local directory.

Download the required files from: techdocs.zebra.com/ws50/guide/demo/wspicking/.

1. Install Java 12 or a later version and include the `java` command in your system's PATH environment variable.
2. Open a terminal window (such as Windows PowerShell or Command Prompt) in the directory where you saved the `WsPickingServer.jar` file.

A quick way to do this in Windows is to hold **Shift** while right-clicking in the folder and selecting **Open PowerShell window here**.

3. Run the following command:

```
java -jar WsPickingServer.jar
```

4. Open a web browser and then type `localhost` into the address bar.

Wait for the server to start before proceeding.

The WS Picking Application login page displays in your browser.

Logging In

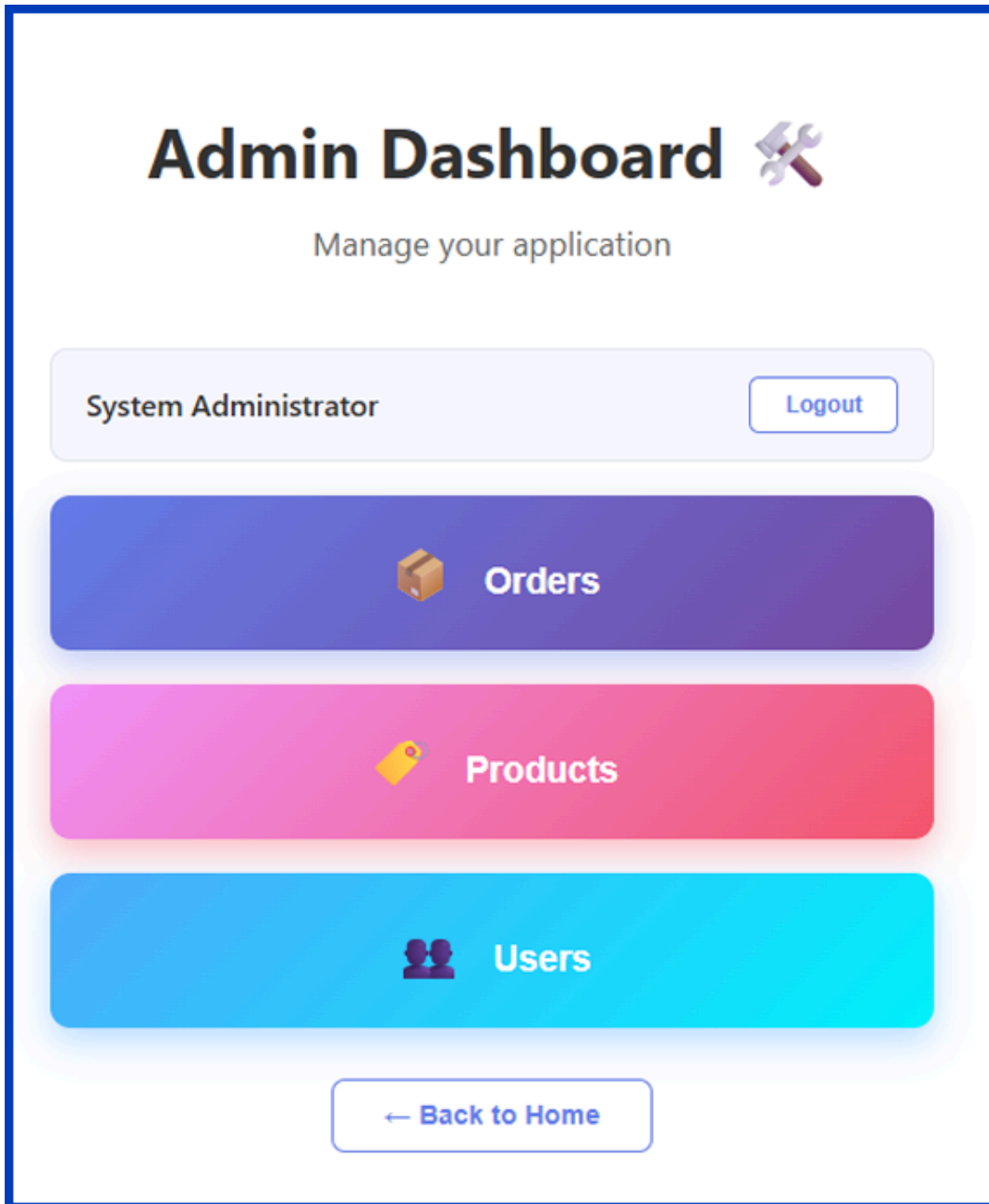
Log in to the application using your credentials.



NOTE: By default, the user name is `admin` and the password is `zebra`.

1. Click **Login (Local Login)**.
2. Enter your user name.
3. Enter your password.

The **Admin Dashboard** displays. From here, select **Orders**, **Products**, or **Users** to begin managing the system.



Orders

The Orders screen lists the orders in the system.

Use the **Orders** screen to view the repository of available orders in the system. From this screen, add new orders, modify existing orders, or delete orders as needed.

Customer Name	Order Status	Order Priority	Note	Assignee
Alice Johnson	READY TO PICK	High	Urgent delivery - customer requested same-day pickup	Unassigned
Bob Smith	READY TO PICK	Normal	Standard order - customer will pick up tomorrow	Unassigned
Carol Davis	PICKING IN PROGRESS	Normal	Customer called to add additional items - check with manager	John Smith
David Wilson	PICKING IN PROGRESS	High	VIP customer - ensure quality packaging	Jane Doe
Emma Brown	COMPLETED	Normal	N/A	John Smith
Frank Miller	PICKING PAUSED	Normal	N/A	Jane Doe
Grace Lee	READY TO PICK	Normal	Waiting for item restock - pick at 1:00pm Tuesday	Unassigned

7 orders loaded

Adding Orders

Create customer requests by specifying fulfillment details, assigning personnel, and associating specific products with the order.

1. On the **Orders** screen, click **Add Order**.

The **New Order** screen displays.

New Order

Modify order details and products

Order Information

Customer Name *	Order Number	Status *
<input type="text"/>	Will be Generated	Ready To Pick
Picker (Optional)	Targeted Pickers (Optional)	<input type="checkbox"/> Mark as High Priority
-- Not Assigned --	-- No Targeted Pickers --	
Note		
<input type="text"/>		

Products to Pick

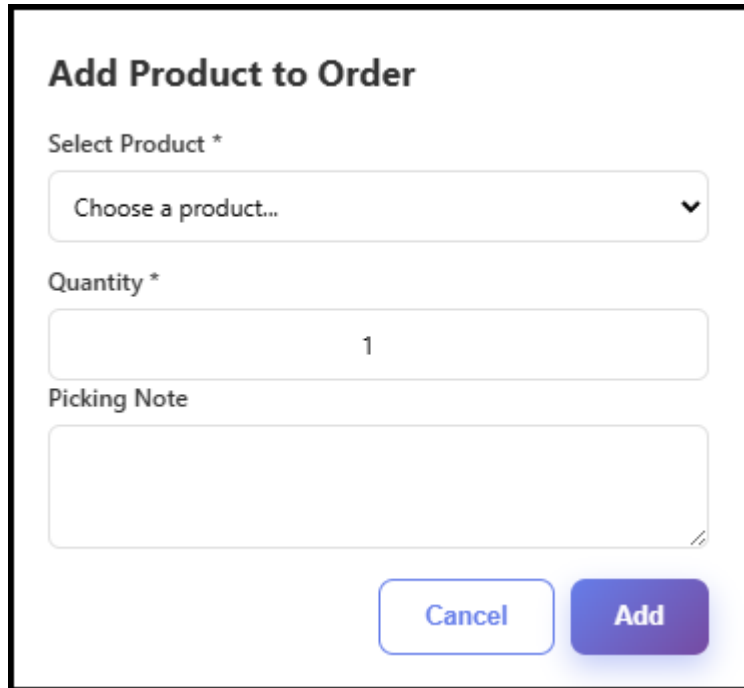
No products added yet. Click "Add Product" to start.

[+ Add Product](#)

[X Cancel](#) [Save Order](#)

2. Enter the **Order Information**.
 - a) Enter the **Customer Name**.
 - b) Select the **Status**.
 - c) (Optional) Select a **Picker**.
 - d) (Optional) Select **Targeted Pickers**.
 - e) Select **Mark as High Priority** if the order is high priority.
 - f) Enter additional information in the **Note** field.
3. Click **Add Product**.

The **Add Product to Order** screen displays.



Add Product to Order

Select Product *

Choose a product...

Quantity *

1

Picking Note

Cancel Add

- a) Select a product to enter.
 - b) Enter the quantity.
 - c) Enter additional information specific to the product in the **Picking Note** field.
 - d) Click **Add**.
4. Click **Save Order**.
- A confirmation window displays.
5. Click **OK**.

Modifying Existing Orders

Modify or delete existing orders in the system.

1. On the **Orders** screen, click the desired order.
The **Edit Order** screen displays.

Edit Order #3

Modify order details and products

CAUTION: ACTIVE PICKER DETECTED. An associate is currently scanning items for this order in the store. To prevent inventory errors or duplicate picking, please contact the picker before modifying quantities or deleting items.

Order Information

Customer Name * Order Number Status *

Picker (Optional) Targeted Pickers (Optional) Mark as High Priority

Note

Products to Pick

Zebra W5501 Wearable Computer UPC: 567890123456 <input type="text" value="One item damaged, check replacement"/>	Picked: <input type="text" value="2"/>	Total: <input type="text" value="3"/>	<input type="button" value="Remove"/>
Zebra ZD421 Label Printer UPC: 345678901234 <input type="text" value="Add a picking note..."/>	Picked: <input type="text" value="1"/>	Total: <input type="text" value="1"/>	<input type="button" value="Remove"/>
Zebra MC9450 Mobile Computer UPC: 456789012345 <input type="text" value="Add a picking note..."/>	Picked: <input type="text" value="0"/>	Total: <input type="text" value="2"/>	<input type="button" value="Remove"/>






2. (Optional) Click **Delete Order** to remove the order; otherwise, proceed to the next step.
 - a) Click **OK** when the confirmation dialog box displays.
3. Make the necessary changes.
 - a) Click **Remove**.
 - b) Click **OK** when the confirmation dialog box displays.
4. Click **Save Order**.
5. Click **OK**.

Products

The **Products** screen lists all the products available.

Use the **Products** screen to view the repository of available products in the system. From this screen, add new products, modify existing products, or delete products as needed.

The screenshot displays the 'Products' management interface. At the top left, the title 'Products' is accompanied by a small box icon. To the right, the user is identified as 'System Administrator' with a 'Logout' link. A prominent pink '+ Add Product' button is located in the top right corner. Below the header, a search bar prompts the user to 'Search by name, location, or UPC code...' with a magnifying glass icon and a 'Clear' button. The main content is a table with the following data:

Name	Picture	Location	UPC Code
Zebra WS501 Wearable Computer		A-02-2	567890123456
Zebra WS301 Wearable Computer		A-02-3	678901234567
Zebra WS101 Bluetooth Badge		B-01-1	789012345678
Zebra TC53e Mobile Computer		A-01-1	123456789012
Zebra DS2208 Barcode Scanner		A-01-2	234567890123

At the bottom of the table, a status bar indicates '7 products loaded'. A blue 'Back' button is positioned in the bottom right corner of the interface.

Adding New Products

Populate the system inventory with new items to enable tracking, warehouse organization, and order fulfillment.

1. Click **Add Product**.

The **New Product** screen displays.

2. Enter the **Product Information**.

- a) Enter the **Product Name**.
- b) Enter the **Warehouse Location**.
- c) Enter the **UPC Code**.



IMPORTANT: Enter the UPC code correctly to ensure accurate product identification.

- d) Upload the **Product Image**.

3. Click **Save Product**.

A confirmation window displays.

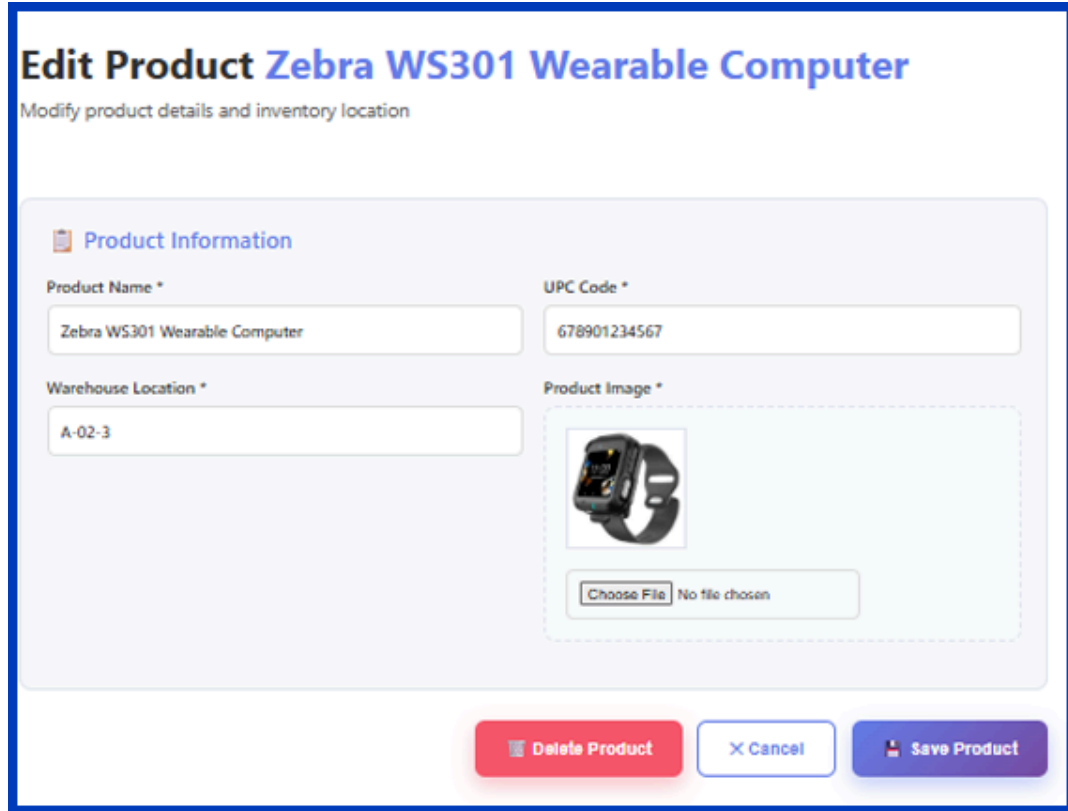
4. Click **OK**.

Modifying Existing Products

Modify or delete existing products in the system.

1. Click the desired product.

The **Edit Product** screen displays.



Edit Product Zebra WS301 Wearable Computer
Modify product details and inventory location

Product Information

Product Name *
Zebra WS301 Wearable Computer

UPC Code *
678901234567

Warehouse Location *
A-02-3

Product Image *
Choose File No file chosen

Delete Product Cancel Save Product

2. (Optional) Click **Delete Product** to remove the product; otherwise, proceed to the next step.
 - a) Click **OK** when the confirmation dialog box displays.
3. Make the necessary changes.
4. Click **Save Product**.
5. Click **OK**.

Users

Manage the repository of available users in the system.

Use the **Users** screen to view the repository of available users in the system. From this screen, add new users, modify existing user profiles, or remove users as needed.

Users

System Administrator [Logout](#) [+ Add User](#)

Manage user accounts and roles

Search [X Clear](#)

Full Name	Username	Role	Status
System Administrator	admin	SYSTEM ADMIN	Enabled
Product Manager	product_admin	PRODUCT ADMIN	Enabled
Order Manager	order_admin	ORDER ADMIN	Enabled
John Smith	john	PICKER	Enabled
Jane Doe	jane	PICKER	Enabled
Guest User	guest	GUEST	Enabled

6 users loaded

[← Back](#)

Adding a User

Establish system access for new personnel by defining credentials, assigning functional roles, and setting account permissions.



NOTE: You must have administrator permissions to add new users.

Create new user accounts to grant individuals access to the system based on their assigned roles and permissions.

1. Click **Add Users**.

The **New User** screen displays.

New User

Manage user account details and role

Account Information

Full Name * Username *

Role * Account Enabled Enabled

Password

Password * Confirm Password *

Role Permissions

Select a role to see its permissions.

2. In the **Account Information** section, enter the user account information.
 - a) In the **Full Name** text box, enter the first and last name of the user.
 - b) In the **Username** textbox, enter the username for the new user.
 - c) From the **Role** dropdown, select a role for the new user.
 - d) Toggle **Account Enabled** to **Enabled** if the user account is ready for use.
 3. In the **Password** text box, enter a password that has at least 5 characters.
 4. In the **Confirm Password** text box, enter the password again.
 5. Create a **Password** for the user account.
 6. Examine the **Role Permissions**.

If any permissions seem incorrect, change the **Role** in the **Account Information** section to match the expected permissions.
 7. Click **Save User**.

A confirmation window displays.
 8. Click **OK**.
- The new user account displays in the **Users** list.

After creating the account, provide the user with their login credentials to access the system.

Modifying Existing Users

Find, modify, or delete an existing user account.

You must have administrator privileges to manage user accounts.

Keep the user database up to date by modifying user details or removing accounts that are no longer needed.

1. Use the **Search** bar to find the desired user account.
2. Select the user account from the search results.

The user's account details page displays.

Edit User John Smith
Manage user account details and role

Account Information

Full Name * Username *

Role * Account Enabled Enabled

Password

New Password Confirm New Password [Change Password](#)

Click "Change Password" to set a new password.

Role Permissions

[View Products](#) [View Orders](#) [Pick Orders](#)

[Delete User](#) [Cancel](#) [Save User](#)

3. (Optional) Click **Delete User** to remove the account.
A dialog box displays to confirm the action.
 - a) Click **OK** to permanently delete the user.
4. Make the necessary changes to the account details.
5. Click **Save User**.

6. Click OK.

The selected user's account reflects the updated information, or the account no longer displays in the **Users** list.

Application Overview

User features enable order picking and product scanning within the WS Picking application.

The WS Picking client application is optimized for use on the 2-inch screen of Zebra WS wearable devices. The application guides users through a picking workflow using focused, single-step activity screens.

The application provides the following user features:

- **Login**—Log in by scanning a QR code at a login station (remote login) or by typing credentials directly on the device (local login).
- **Order picking**—Pick one order at a time by scanning the barcode of each product instance or entering a quantity manually.

Installing the WS Picking Application

To use the WS Picking application, install it on a device using Android Debug Bridge (ADB).

Download the required files from: techdocs.zebra.com/ws50/guide/demo/wspicking/.



NOTE: While the WS Picking application installs on any mobile computer, Zebra recommends using WS devices as the app was developed specifically for WS devices.

1. Install the ADB drivers on the host computer.
2. Connect the device to a host computer using the USB-C cable.
3. Touch **Settings**.
4. Touch **About phone**.
5. Scroll down to **Build number**.
6. Touch **Build number** seven times.
The message **You are now a developer!** displays.
7. Touch **Back**.
8. Touch **System > Developer options**.
9. Slide the **USB debugging** switch to the **ON** position.
10. Touch **OK**.
11. (First-time connection only) Select **Always allow from this computer** when the **Allow USB debugging?** dialog box displays.

12. Touch **OK** or **Allow**.
13. On the host computer, navigate to the `platform-tools` folder and then open a command prompt window.
14. Type `adb install application`.
where: *application* = the path and filename of the apk file.
15. Disconnect the USB-C cable from the device.

Logging In Remotely

Log in to the WS Picking application remotely by scanning a QR code.

Ensure the device is on the same network as the server.

1. On the server computer, click **Remote Login – for order picking**.
2. On the device, launch the WS Picking application.
3. Scan the QR code.
4. On the server computer, enter your login information.



NOTE: Only enter your credentials if your mobile device displays a green screen. If you do not see a green screen, go back and restart the remote login process.

A list of orders displays.

Picking an Order

Select and pick products for an order using the **Picking Screen**.

Log in to the system and ensure you have an assignment to pick orders.

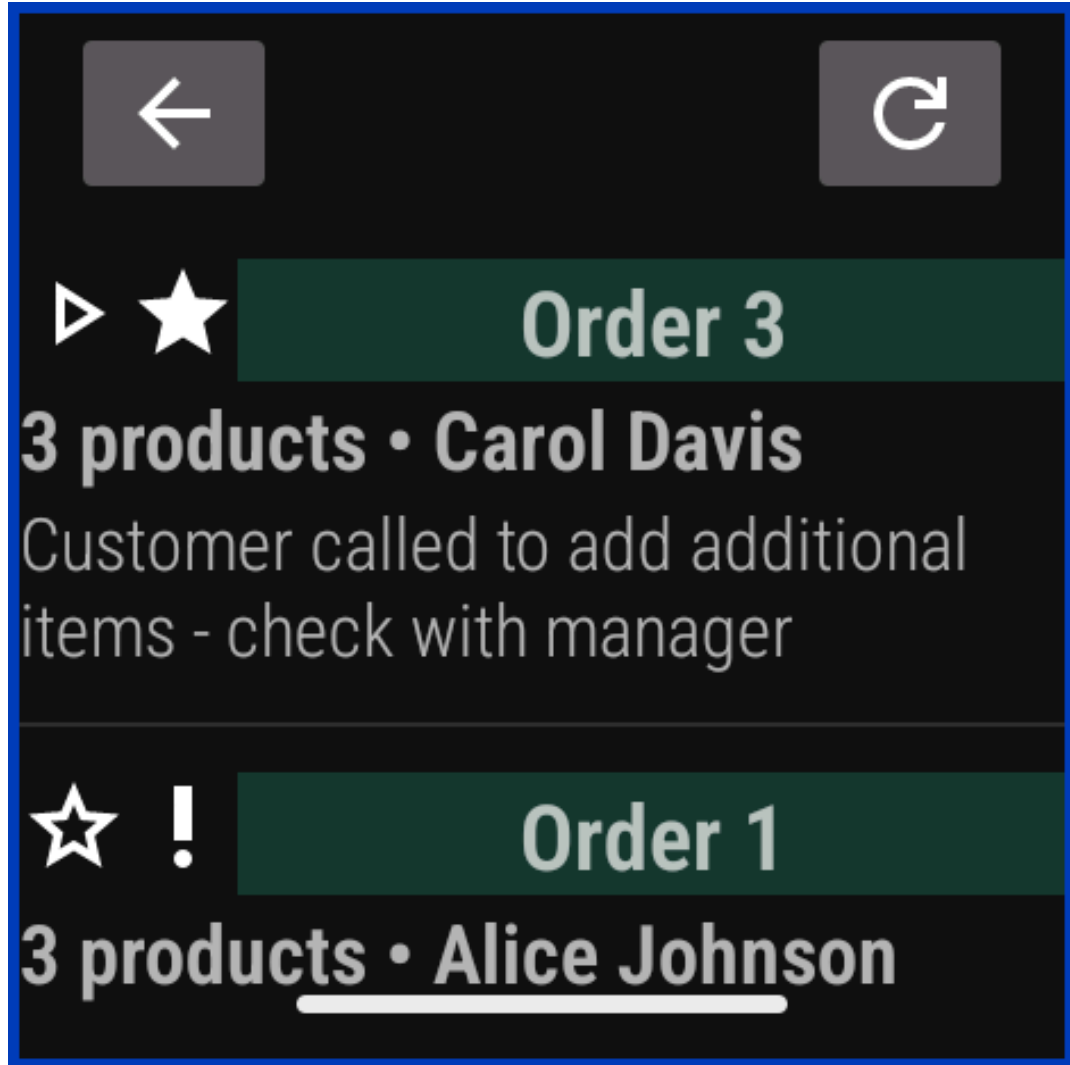
Use the **Picking Screen** to view assigned orders, identify urgent tasks, and efficiently log scanned products to fulfill an order.

1. Navigate to the desired order.

Each order displays a description, the assigned picker, and the total number of products.



NOTE: To update the order list, tap **Refresh**.



NOTE:

- A ! symbol displays next to urgent orders.
- A full star displays next to orders officially assigned to you.
- An empty star displays next to orders where you are a targeted picker (selected as a potential picker for that specific order).

2. Select an order to begin picking.



The first product for the selected order displays.

3. Review the product details.

If the product requires additional information, tap .

- a) Tap either **No Stock** or **Subst.** for out-of-stock or substitute products.

If you tap **No Stock**, a message displays in the text field indicating the product is out of stock. If you tap **Subst.**, you must scan the substitute product.

- b) Tap the **Note** field to enter custom information about the product.

4. Use the arrows to navigate to the product you are picking.

5. Scan the product's barcode.

The picked quantity count increases. When you reach the required quantity for the product, the next product in the order displays.



NOTE: If needed, you can tap the quantity to manually edit the quantity count.

6. Repeat the scanning process until you pick all products in the order.

7. When exiting an order, choose one of the following:

- **Picking Paused** – for when an order is meant to be resumed at a later time.
- **Picked with Exceptions** – for when an order has been fully picked, but a few of the products had exceptions (such as no stock or a substitution).
- **Complete** – for when all products have been fully picked.

When you scan all products, the order is complete and no longer displays in your active picking list.

Proceed to the next assigned order or tap **Refresh** to check for new assignments.

