# WS501-R Wearable Computer

## The smallest all-in-one RFID wearable mobile computer—now supercharged with next-generation power and speed for unmatched performance

Until today, wearable RFID meant choosing between ergonomics and performance. Now you can have it all with the WS501-R, providing powerful and flexible UHF RFID capabilities integrated into the advanced, next-generation WS501 wearable computer. The result is a no-compromise device that's faster, smarter, and more powerful than ever before. Workers can effortlessly capture RFID tags and scan barcodes without switching devices, simplifying workflows, increasing workforce productivity and eliminating the need to purchase and manage separate RFID readers or RFID sleds. And if you are upgrading from the existing WS50 RFID, you get a significant leap forward in processing power, plus triple the memory, quadruple the Flash and next generation wireless network support—Wi-Fi 6 and Bluetooth 5.3.



### All the Features of a Full-Size Mobile Computer

**Optimize Efficiency and Accuracy with Enterprise-class UHF RFID**
Powered by Zebra's industry-leading RFID technology, the WS501-R delivers the rapid, reliable performance needed for the most demanding inventory and asset management tasks. Add an optional external downward facing antenna to the integrated upward-facing antenna to expand use cases—workers can automatically capture any RFID tag within the 5 ft. (1.5 m) read range without the need to orient the WS501-R in any direction.

The advanced design of both antennas delivers unmatched read sensitivity and accuracy. The flexible read range can be configured for a specific task, or adjusted dynamically within a workflow, ensuring the capture of the right tags, right now—even in the densest RFID environments. For example, workers can use the downward-facing antenna at close range to identify a specific item during picking, while the upward-facing antenna can read all tags simultaneously to ensure the right shipments are loaded into a delivery truck—before it departs.

**Advanced Enterprise-class Barcode Scanning**
The WS501-R offers the best of both worlds—short range UHF RFID and best-in-class 1D/2D barcode scanning, all in one device. Barcode scanning is the perfect complement to RFID, allowing workers to capture barcodes in addition to RFID tags—and enterprises to enrich applications with more data. The integrated SR560 imager scans virtually any barcode in practically any condition, even if it is damaged or poorly printed. Workers can scan barcodes as fast as they can press the trigger. And with superior motion tolerance, workers can capture barcodes even if the WS501-R and the barcode are in motion. The wide field of view makes it easy to capture large or multiple barcodes. And Zebra's complementary tools can not only capture all barcodes on one or more labels on a single item, box or pallet, but also properly format and transmit the data to the right fields in your applications—all with the press of the scan button.

**Accelerate high-volume workflows with the WS501-R—the smallest all-in-one RFID-enabled, host-free wearable computer, built for nonstop enterprise performance.**
For more information, please visit www.zebra.com/ws501-r

### Advanced Touchscreen Display for Easy Viewing
The two-inch AMOLED color display offers exceptional performance. It is extraordinarily bright—no backlight is required. Low power consumption extends battery run time. Better contrast and viewing angles deliver superior readability. Qualcomm® TruPalette™ Display makes colors look vibrant and true to life, while Qualcomm Low-Power Picture Enhancement adjusts to lighting, making the screen easy to read—without the need to manually adjust display settings.

### Save Time with Programmable Buttons
Make task execution easy with two programmable buttons that can be mapped to different functions, such as push-to-talk, RFID capture, or opening a specific application.

### Full-shift Power
The WS501-R delivers all-shift power you can count on, ensuring your RFID workflows are never interrupted, even during peak scanning periods. The battery provides plenty of power for a full shift. With fast charging, the removable hot-swappable batteries can be fully charged in under three hours. The result? Devices can stay in service every minute of every shift, instead of on a charger.

### A Small Device Built for Big Business
Ready for life on loading docks, manufacturing floors, and warehouses, the WS501-R is built to handle drops, temperature extremes, dust, and water exposure. And a replaceable front shell helps keep devices in service and looking new.

## Improve Productivity with High Performance Apps

### More Processing Power and Memory for Multi-app Performance
With the WS501-R, workers can capture high volumes of RFID tags and run complex inventory applications simultaneously, ensuring fast screen refreshes that keep workers moving, instead of waiting. With its faster, modern processor and substantial increase in memory, you can count on the WS501-R to meet your RFID and scanning needs today—and well into the future.

### Fast and Reliable Wi-Fi Connections
Wi-Fi 6 enables more simultaneous network connections, with improved speed, security and latency, reducing network congestion and increasing connection reliability. And with Zebra DNA Wireless Fusion—only from Zebra—workers get a superior 'no dropped connections' experience while roaming.

### Blazing Bluetooth Peripheral Performance
Bluetooth 5.3 improves the performance of Bluetooth Low Energy (BLE) peripherals, delivering more speed, more range, more power efficiency, more security and faster, easier pairing.

## Flexibility that Fits your Workflows

### All-in-one—No Host Required
With this true converged wearable solution, workers only need to wear one device to capture and access data—instead of a host mobile computer and ring scanner.

### Wear It Your Way with Three Flexible Wearing Styles
Wrist, two-finger, and back-of-hand wearing styles all deliver the right balance of ergonomics, comfort, and performance—plus the flexibility to change wearing styles as workflows change.

### Push-to-talk (PTT) Support for Better Collaboration
With an embedded microphone and speaker, the WS501-R allows staff to instantly reach co-workers and supervisors with the push of a button for fast issue resolution—without the need to purchase and manage separate voice devices.

## Streamlined Management Across the Device Lifecycle

### Easily Integrate into Your Environment
The Enterprise Mobility Development Kit (EMDK) makes it easy to take full advantage of all device features. And DataWedge easily captures, properly formats, and transmits data in the right order to the right applications—without coding or modifying existing apps.

### Quickly Locate Lost Devices
Easily find missing devices through proximity guidance and audible alerts with Device Guardian, an optional Zebra DNA tool—virtually eliminating the high cost of device loss.

### Increase Device and Data Security
Add enterprise-class features that increase device and OS security with Mobility Extensions (Mx). Get timely Android OS updates with LifeGuard™ for Android™. And control the apps and device features users can access with Enterprise Home Screen,

### Simplify Deployment and Lifecycle Management
Easily set up, secure, manage and optimize Zebra mobile computers with Zebra DNA software tools. And conveniently manage Zebra DNA tools in one place with Zebra DNA Cloud.

# Specifications

| Physical Characteristics | |
|---|---|
| **Dimensions** | H x W x D: 3.18 x 2.4 x 1.49 inches (81 x 61 x 38 mm) |
| **Weight** | Finger mount: 6.9 oz. (196 g) |
| **Display** | 2 inch AMOLED 460 x 460 color display; optically bonded to touch panel |
| **Imager Window** | Corning™ Gorilla™ Glass |
| **Touch Panel** | Capacitive touch panel; fingertip and glove support; Corning™ Gorilla™ Glass |
| **Power** | 9.24 Watt Hours; 2400mAh PowerPrecision; Hot Swap (2 minutes, memory persistent) |
| **Network Connections** | USB 2.0 High Speed (host and client), WLAN and Bluetooth |
| **Notifications** | Audible tone; charge LED; OS notification LED; multi-color Application LEDs (2); haptic feedback |
| **Voice and Audio** | Speaker (90dBA); internal mic; PTT ready; Bluetooth headset support |
| **Buttons** | Trigger; 2 buttons (programmable) |
| **Interfaces** | Docking contacts; Via interface cables: USB 2.0 host/client and charging |
| **Performance Characteristics** | |
| **CPU** | Qualcomm® QCS2290, quad-core, 2.0 GHz |
| **Operating System** | Android; for supported Android versions, visit: www.zebra.com/android-versions |
| **Memory** | 3 GB RAM/32 GB Flash |
| **User Environment** | |
| **Operating Temperature** | 14.0°F to 122.0°F (-10.0°C to 50.0°C) |
| **Storage Temperature** | -40.0°F to 158.0°F (-40.0°C to 70.0°C) |
| **Humidity** | 5% - 95% non-condensing |
| **Drop Specification** | 5 ft. (1.5 m) drop to concrete per MIL-STD 810G across operating temperature |
| **Tumble Specification** | 2,000 tumbles @ 1.6 ft. (0.5 m) Meets and exceeds IEC tumble specifications |
| **Sealing** | IP65 |
| **Vibration** | 4 g's PK Sine, 5hz to 2khz, 1 hour duration per axis; 0.04 g2/Hz Random (20 Hz to 2 kHz), 1 hour duration per axis |
| **Electrostatic Discharge (ESD)** | +/-15 kV air discharge, +/-8 kV direct/ indirect discharge |

| Interactive Sensor Technology (IST) | |
|---|---|
| **Light Sensor** | Automatically adjusts display backlight brightness |
| **Motion Sensor** | 6-axis accelerometer with MEMS Gyro |
| **Data Capture** | |
| **Scanning** | SR560 1D/2D standard range omni-directional imager |
| **NFC** | Tap to Pair, ISO 14443 Type A and ISO 15693 cards, and Card Emulation via Host (HCE) support |
| **RFID** | |
| **Standards Supported** | EPC Class 1 Gen 2; EPC Gen 2 V2 |
| **RFID Engine** | Zebra proprietary radio technology |
| **Nominal Read Range** | ~5 ft. (~1.5 m) |
| **Frequency Range/ RF System Output** | US: 917-928 MHz; 0-24 dBm<br>EU: 865-868 MHz; 0-24 dBm |
| **Wireless LAN** | |
| **Radio** | IEEE 802.11 a/b/g/n/ac/d/h/i/r/k/v/w/ mc/ax; Wi-Fi 6; 2x2 MU-MIMO; Wi-Fi™ certified; IPv4, IPv6 |
| **Data Rates** | 5GHz: 802.11a/n/ac/ax—20MHz, 40MHz, 80MHz - up to 1201 Mbps<br>2.4GHz: 802.11b/g/n/ax—20MHz up to 286.8 Mbps |
| **Operating Channels** | Channel 1-13 (2412-2472 MHz): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13<br>Channel 36-165 (5180-5825 MHz): 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165<br>Channel Bandwidth: 20/40/80 MHz<br>Actual operating channels/ frequencies and bandwidths depend on regulatory rules and certification agency. |
| **Security and Encryption** | WEP (40 or 104 bit); WPA/WPA2 Personal (TKIP, and AES); WPA3 Personal (SAE); WPA/WPA2 Enterprise (TKIP and AES); WPA3 Enterprise (AES)—EAP-TTLS (PAP, MSCHAP, MSCHAPv2), EAP-TLS, PEAPv0-MSCHAPv2, PEAPv1-EAP-GTC, LEAP and EAP-PWD; WPA3 Enterprise 192-bit mode (GCMP256) - EAP-TLS; Enhanced Open (OWE) |
| **Certifications** | Wi-Fi CERTIFIED n; Wi-Fi CERTIFIED ac; Wi-Fi CERTIFIED 6; Wi-Fi Enhanced Open; WPA2-Personal; WPA2-Enterprise; WPA3-Personal; WPA3-Enterprise (includes 192-bit mode); Protected Management Frames; Wi-Fi Agile Multiband; WMM; WMM-Power Save; WMM-Admission Control; Voice-Enterprise; Wi-Fi Direct; Wi-Fi QoS Management |

## Markets and Applications

**Warehousing/ Distribution**
- Sorting
- Receiving/put-away
- Picking
- Inventory management
- Loading

**Transportation and Logistics**
- Sorting
- Loading/unloading
- Package handling
- Custom cages

**Manufacturing**
- Pallet/container management
- Parts tracking
- Finished goods verification

**Retail**
- Pricing/markdowns
- Back of store operations
- Task management

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|---|---|
| **Fast Roam** | PMKID caching; Cisco CCKM; 802.11r (Over-The-Air); OKC |

**Wireless PAN**

| | |
|---|---|
| **Bluetooth** | Bluetooth 5.3; Classic Bluetooth Basic Rate (BR)/Enhanced Data Rate (EDR) and Bluetooth Low Energy (BLE) support; Class 1 |

**Warranty**

Subject to the terms of Zebra's hardware warranty statement, the WS501-R is warranted against defects in workmanship and materials for a period of one (1) year from the date of shipment. For complete warranty statement, please visit: www.zebra.com/warranty

**Recommended Services**

Zebra OneCare™ Essential and Select support services; Zebra Visibility Services—VisibilityIQ™ Foresight; For information on Zebra services, please visit www.zebra.com/services

**Zebra DNA**

For information on Zebra DNA, visit www.zebra.com/zebradna. Zebra DNA features vary by model; a support contract may be required. To learn what solutions are supported, visit: https://developer.zebra.com/zebra-dna

**Footnotes**

1. Requires a Zebra OneCare maintenance plan.
Specifications are subject to change without notice.

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