



UHF | HF - Handheld Reader Zebra - TC501

- Integrated HF RFID / NFC (ISO/IEC 14443 Type A & B, 15693)
- Integrated UHF RFID (EPC Class 1 Gen2 / ISO 18000-6C)
- Integrated professional 1D/2D barcode scanner
- Hot-swappable battery
- IP65 / IP67 sealing

UHF | RAIN - Handheld Reader AI-Driven Rugged Mobility

Empowering your frontline with AI propels productivity, efficiency, customer satisfaction and profitability to exceptional heights. But running AI apps takes the right device. It takes the power to enable ultra-responsive apps. It takes the ability to capture a wealth of data to streamline and automate workflows, and empower workers with a new level of business intelligence-plus the durability to handle whatever the workday brings. Get it all with the TC501. A groundbreaking new processor is the new heart of the TC501, built specifically to enable high performance AI on-device. Zebra's most powerful platform offers the most memory, the most advanced display technology, the fastest wireless networks and the most data capture options in any TC5 device—all in the most rugged TC5 device we've built to date. And develop AI apps in days instead of months with Zebra's Frontline AI Suite. Empower your workers to work smarter every day with the TC501—the mobile computer built for the AI-powered generation.

Get the processing power of a workstation with Qualcomm's new Dragonwing™ Q-6690—delivering up to a 300% increase in performance over legacy TC5 Series devices.¹ Easily support the AI applications of today and tomorrow with the integrated, dedicated AI engine. And a major leap in processing efficiency reduces power requirements, preserving battery power.

Class-leading memory supports the most AI data-intensive apps, with up to 12 GB RAM and 256 GB Flash—up to 3x the RAM and 8x Flash compared to legacy TC5s—and a 2 TB MicroSD card slot.

Common Applications

- Retail operations and assisted selling
- Warehouse and distribution centers
- Field service and maintenance
- Manufacturing and production
- Asset tracking and inspection



TECHNICAL SPECIFICATIONS

Physical Characteristics

Dimension	163.15 x 77.9 x 15.5 mm
Weight	273 g with 5000 mAh battery 303 g with 7240 mAh battery
Display	6.0 inch color Full High Definition+; 2160x1080; AMOLED; 1500 NITS; adaptive refresh rate, optically bonded to touch panel, Gorilla Glass Victus
Imager Windows	Corning® Gorilla® Glass
Touch Panel	Multi-mode capacitive touch with bare or gloved fingertip input or passive stylus (sold separately); water droplet rejection; fingerprint resistant anti- smudge coating
Power	Rechargeable Li-Ion, PowerPrecision+ for real- time battery metrics; Standard capacity: 5000 mAh (19.45 Watt hours); Extended capacity: 7240 mAh (28.16 Watt hours); Qi compatible Wireless charge battery: 5000 mAh (19.45 Watt hours); fast charging; Hot Swap capable
Expansion Slot	Audible tone, vibration
SIM	Decode LEDs, battery status LED, beeper
Network Connections	On-screen keypad
Notifications	User-programmable button for barcode scanning (default), PTT or other use, volume up/down, power
Voice and Audio	Tri-function user-programmable trigger
Buttons	USB 3.1 (Bottom Type C), Super Speed (host and client)
Interface Ports	USB Type C (USB 3.1); bottom and back IO (USB 2.0)

Performance Characteristics

CPU	Qualcomm® Dragonwing™ Q-6690 octa-core processor; up to 2.9 GHz (SKU specific)
Operating System	Android: for supported Android versions, visit: www.zebra.com/android-versions
Memory	8 GB LPDDR RAM/128 GB UFS 3.1 Flash; 12 GB LPDDR5 RAM/256 GB UFS 3.1 Flash
Security	Android Strongbox with Secure Element IC; FIPS 140-2 Validated (ISO 19790) and Common Criteria certified (ISO 15408); Supports Secure Boot and Verified Boot

User Environment

Operating Temp.	-4°F to +122°F (-20°C to +50°C)
Storage Temp.	-40°F to +158°F (-40°C to +70°C)
Humidity	5%-95% non-condensing
Sealing	IP68 and IP65 per IEC 60529 standard
Tumble Specification	2000 1.6 ft. (0.5 m) tumbles 2000 3.3 ft. (1.0 m) tumbles with rugged boot
Drop Specifications	Exceeds MIL-STD-810H: 6 ft. (1.83 m) to concrete at -4°F to +122°F (-20°C to +50°C) 8 ft. (2.44 m) to concrete @ room temperature With rugged boot: 7 ft. (2.13 m) to concrete at -4°F to +122°F (-20°C to +50°C) 9 ft. (2.74 m) to concrete @ room temperature
Electrostatic Discharge (ESD)	+/- 20 kV air discharge; +/- 8 kV direct discharge; +/- 10 kV indirect discharge

Data Capture

Scanning	SR500 1D/2D Scan Engine; SR560 1D/2D Scan Engine; AC670 Advanced Range Color 1D/2D Scan Engine
Rear Camera	50 MP autofocus with 0.6 µm pixel: Phase Detection Auto-focus (PDAF); flash LED generates balanced white light; supports Torch mode + HDR Optional 50 MP with 1 µm pixel: Quad Phase Detection Auto-focus (QPD AF)
Front Camera	8 MP; fixed focus
Ultra-wide Rear Camera	13 MP autofocus; Phase Detection Auto- focus (PDAF); 5cm-infinity
Time of Flight (iTOF)	Available on select SKUs
NFC	NFC ISO 14443 Type A and B; Mifare, FeliCa and ISO 15693 cards, Mifare Desfire EV1, EV2, EV3, NFC Forum tags 2,3,4,5; EMVCO Read Range 2 compliant; Host Card Emulation, Contactless Payment Support, VAS (Value Added Services) and Wallet support, Apple ECP1.0 and ECP2.0, Apple VAS and Google Smart Tap certified, VAS Library/SDK
Integrated RFID	Short range integrated UHF RFID; up to 6.5 ft. (2 m); reads > 200 tags per second; EPC Class 1 Gen2; EPC Gen 2 V2; EU 865-868 MHz and US 902-928 MHz

TECHNICAL SPECIFICATIONS

Wireless PAN

Bluetooth	Configurable Class 1 and 2; Bluetooth V6.0 with 2X2 Tx Chipset-enabled secondary BLE beaconing support
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Wireless LAN

Radio	IEEE 802.11 be/ax/ac/n/a/g/b/mc/az/d/h/i/r/k/u/v/w Tri-band (2.4 GHz, 5 GHz, 6 GHz), 2x2 MU-MIMO Wi-Fi CERTIFIED 7™ MLO (Simultaneous Transmit and Receive MLMR) in Dual-band modes: 2.4+5+6, 5+5+6, 5+6, 5+5, 2.4+5, 2.4+6 Dual Band Simultaneous, High Band Simultaneous; IPv4, IPv6; Wi-Fi Aware
Data Rates	2.4 GHz: 802.11b/g/n/ax/be-20 MHz - up to 344 Mbps 5 GHz: 802.11a/n/ac/ax/be-20 MHz, 40 MHz, 80 MHz, 160 MHz-up to 2882 Mbps 6 GHz: 802.11ax/be-20 MHz, 40 MHz, 80 MHz, 160 MHz, 320 MHz-up to 5764 Mbps
Operating Channels	Channel 1-13 (2401-2483 MHz): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13; Channel 36-165 (5150-5850 MHz): 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165; Channel 1-233 (5925-7125 MHz); Channel Bandwidth: 20, 40, 80, 160, 320 MHz Actual operating channels/frequencies and bandwidths depend on regulatory rules and certification agency.
Fast Roam	802.11r Fast BSS Transition; PMK Caching; Cisco CCKM; OKC
Fast Roam Security and Encryption	WPA3 Enterprise 192-bit mode, GCMP-256-EAP-TLS; WPA3 Enterprise, AES-CCMP-128, GCMP-256-EAP-TLS (PAP, MSCHAP, MSCHAPv2), EAP-TLS, PEAPv0-MSCHAPv2, PEAPv1-EAP-GTC, EAP-PWD; WPA3 Personal (SAE, SAE-EXT), AES CCMP-128, GCMP-256; WPA/WPA2 Enterprise, TKIP and AES-CCMP-128; WPA/WPA2 Personal (PSK), TKIP and AES-CCMP-128; Enhanced Open (OWE), AES-CCMP-128, GCMP-256; WEP 40 bit and 104 bit; WAN only: EAP-SIM, EAP-AKA, EAP-AKA Prime
Certifications	Wi-Fi Alliance Certifications: Wi-Fi CERTIFIED 7; Wi-Fi CERTIFIED 6 (Wi-Fi 6E); Wi-Fi CERTIFIED ac; Wi-Fi CERTIFIED n; WPA2-Personal; WPA2-Enterprise; WPA3-Personal; WPA3-Enterprise (includes 192-bit mode); Protected Management Frames; Wi-Fi Enhanced Open; WMM (Wi-Fi Multimedia); WMM-Power Save WMM-Admission Control; Voice-Enterprise; Wi-Fi Direct; Wi-Fi Agile Multiband; Wi-Fi QoS Management; Wi-Fi Optimized Connectivity; Passpoint

Wireless WAN, Data and Voice Communications

GPS (WWAN SKU only)	GPS, GLONASS, a-GLONASS, Galileo, Beidou, QZSS, Triple-Band GNSS—concurrent L1/G1/E1/B1; (GPS/QZSS, GLO, GAL, BeiDou) + L5/E5a/BDSB2a (GPS/QZSS, GAL, Beidou)+ I2(GPS+ QZSS L2C), a-GPS; supports XTRA
Multimedia	50 MP autofocus with 0.6 µm pixel: Phase Detection Auto-focus (PDAF); flash LED generates balanced white light; supports Torch mode + HDR Optional 50 MP with 1 µm pixel: Quad Phase Detection Auto-focus (QPD AF)
Radio Frequency Band	Bands: 5G FR1: n1/2/3/5/7/8/12/13/14/20/25/26/28/29/30/38/40/41/48/53/66/70/71/75/76/77/78/79 4G: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 /30/32/34/38/39/40/41/42/43/48/53/66/68/70/71/106; 3G: B1/2/4/5/6/8/19; 2G (ROW SKU only): 850/900/1800/1900; Rel-17, Dual SIM/Dual Standby, Gigabit LTE-A, 5G NR Sub-6 (NSA, SA), LTE/NR Carrier Aggregation (CA), LTE CA-up to 3DLCA, 2ULCA, NR CA: Up to 3DL, 2UL; 4x4 DL MIMO7: 5G FR1: n1/2/3/7/25/30/38/40/41/48/66/70/77/78/79; 4G LTE: 1/2/3/4/7/25/30/38/40/41/42/43/48/66/70; Private Cellular: B48/53/106/68

Interactive Sensor Technology (IST)

Light sensor: automatically adjusts display brightness
Motion sensor: 3-axis gyroscope, 3-axis accelerometer
Magnetometer: eCompass automatically detects direction and orientation
Pressure sensor/barometer: WWAN SKU only
Proximity sensor: Automatically disables the display and touch input when the device is positioned close to the ear