FXR90 Ultra-Rugged Fixed Readers

Rock-solid reliability against punishing conditions

As more industries choose fixed RFID infrastructure for their asset tracking, you need a reader designed to operate anywhere, even in the harshest environments like those found in transportation/logistics, warehousing, and manufacturing enterprises. Readers must withstand moisture and dirt while operating at a wide range of temperatures. Zebra's FXR90 Ultra-Rugged Fixed RFID Readers are built for extreme conditions—both indoors and outdoors—and sealed to industrial-grade dual IP65 and IP67 ratings for reliable performance anywhere. Their versatile design includes an integrated RFID antenna built in for streamlined deployment, even across the largest facilities. And with built-in wireless technologies, such as Wi-Fi 6, Bluetooth®, 5G, GPS, and CBRS, the FXR90 provides unmatched connectivity, even outside the facility's four walls, to meet the demands of today and the innovations of tomorrow.



Optimize your asset management

Ultra-rugged design
Zebra's FXR90 Ultra-Rugged RFID Readers are engineered to withstand exposure to weather extremes and daily wash-downs in transportation/logistics, warehousing, and manufacturing environments. These ultra-rugged readers are dust-, spray-, and waterproof, with an extended operating temperature range that allows workers to track critical items even where dirt and moisture infiltration or extreme temperatures are common.

Industry-leading performance
With a robust read rate of up to 1,300+ tags per second, FXR90 Readers enable greater visibility and real-time data wherever you need it most. And with rugged, sealed M12 connectors, as well as higher receiver sensitivity, you can expect reliable performance and increased accuracy in even the most challenging environments.

Simplified deployment
FXR90 Readers have wireless technologies built in for easy configuration and management of a fleet of readers. Integrated Bluetooth 5.3 wireless capability connects to almost any Android™ or Windows device. Take advantage of the simple, cable-free deployment allowed by a proprietary built-in RFID antenna and gain the flexibility of a maximized read zone that 4- and 8-antenna port configurations enable.

Ease of use
Access the mobile-friendly web interface to easily configure reader settings and monitor reader health. The operating-system-agnostic interface allows installers to be more mobile and flexible in their work.

Supports GEN2X

FXR90 Ultra-Rugged Fixed RFID Readers deliver industry-leading performance in extreme conditions.

For more information, please visit zebra.com/fxr90

Flexible networking
With 5G, GPS, and CBRS built in, you have more flexibility than ever to build the type of wireless network that works best for your operations, whether inside or outside the four walls of any facility. Choose to deploy Wi-Fi and 5G cellular for easy installation in previously inaccessible remote areas, because you won't need to drop an Ethernet cable. Use GPS data to understand where in the physical world items are being read to tie them back to specific customers or facilities. Connect your reader to your private network using CBRS for more widespread wireless coverage with low latency. The choice is yours.

IoT Connector
With IoT Connector, you can gather data from cloud-capable edge devices in a simple, consistent manner. Use the information and insights gained to make decisions in real time. Developed as a standard feature of our barcode scanners and RFID readers, IoT Connector is simple to configure—no coding required—and uses standard protocols within the Internet of Things.

Versatile power options
With multiple options to power the reader, you have the versatility of selecting the ones that match your needs and conditions. From an IP67 sealed AC/DC power supply for powering in wet and dusty environments both indoors and outdoors, to an IP67 sealed DC/DC power supply for powering from a vehicle, to a standard unsealed indoor AC/DC power supply, your range of operation is broader than ever. And with an option that can be wired directly to an electrical panel or vehicle battery, you can power the reader directly from the source. An additional option is PoE/PoE+ for even more simplistic power.

Available mounting options
The FXR90 Reader comes standard with a flush mount and a VESA mount option for universal mounting to meet your particular circumstance. The articulating VESA mount is compatible with various pole sizes and can be mounted to larger poles using hose clamps, so you have the flexibility of many options for configuration.

Get the most out of your RFID investment—from the leader in RFID
Zebra has more fixed, handheld, and portal RFID systems installed than any other RFID provider, giving you the peace of mind that comes from choosing RFID products that are well-tested in practically every industry—and in some of the world's largest companies. And with over 300 RFID technology patents that have allowed us to deliver many industry firsts, you can count on our best-in-class advanced technologies to maximize the performance of your RFID solution.

Specifications

Physical characteristics	
Dimensions	Without integrated RFID antenna (with flush mount brackets) 13.2 in. x 10.0 in. x 2.2 in. 33.5 cm x 25.4 cm x 5.5 cm Without integrated RFID antenna (without flush mount brackets) 11.5 in. x 10.0 in. x 2.0 in. 29.1 cm x 25.4 cm x 5.2 cm With integrated RFID antenna (with flush mount brackets) 13.2 in. x 10.0 in. x 2.9 in. 33.5 cm x 25.4 cm x 7.38 cm With integrated RFID antenna (without flush mount brackets) 11.5 in. x 10.0 in. x 2.8 in. 29.1 cm x 25.4 cm x 7.08 cm
Weight	Reader only (with flush mount bracket) 5.95 lbs. / 2.70 kg Reader only (without flush mount bracket) 5.50 lbs. / 2.50 kg Integrated Antenna Model (with flush mount bracket) 6.75 lbs. / 3.07 kg Integrated antenna model (without flush mount bracket) 6.30 lbs. / 2.86 kg
Housing material	Diecast aluminum (reader body) Polycarbonate/polybutylene terephthalate blend (antenna radomes)
Visual status indicators	Power Activity Status Application Ethernet Bluetooth Wi-Fi Cellular
SIM	1 Nano SIM and 1 eSIM
System characteristics	
CPU	NXP iMX8 Mini Quad Cortex-A53
Operating system	Linux
Memory	2 GB LP DDR4 RAM / 16 GB eMMC Flash
Cryptography	Transport Layer Security Ver 1.2, 1.3, FIPS 140-2
RFID characteristics	
RFID engine	Zebra Proprietary Radio Technology
Maximum RFID read rate	1,300+ tags/sec
Maximum RFID read range — integrated antenna*	100 ft. / 30.5 m Note: This read distance is with specific tag and setup.
Nominal RFID read range — integrated antenna	55 ft. / 16.7 m
Nominal RFID write/encode range—integrated antenna	15 ft. / 4.5 m
Maximum receiver sensitivity	-92 dBm
Air protocols	ISO 18000-6C (EPC Class 1 Gen2V2)
Gen2 standard	Supports Gen2X capabilities
Wireless LAN	
Radio	IEEE 802.11ax/ac/a/b/g/n 2X2, MU-MIMO, IPv4
Data rate	5 GHz PHY data rates up to 1.2 Gbps; 2.4 GHz PHY data rates up to 458 Mbps
Operating channels	Channel 1–14: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 Channel 36–165: 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 Channel bandwidth: 20, 40, 80 MHz
Security and encryption	WEP/TKIP/AES CCMP/AES GCMP/ WAPI/AES CMAC/AES/CCMP
Wireless PAN	
Bluetooth version	Class 1, Bluetooth v5.3 with BLE
Pairing options	SSP NFC Tag: Tap-to-Pair
Wireless WAN data communications	
Radio frequency band	5G/FR1: n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29/ 30/ 38/ 40/ 41/ 48/ 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/ 46/ 48/ 66/ 71 3G: B1/B2/B4/B5/B8/B19
GPS	GPS/ GLONASS/ BDS/ Galileo/ QZSS/ GNSS
User environment	
Operating temperature	-40°F to 149°F / -40°C to 65°C
Storage temperature	-40°F to 158°F / -40°C to 70°C
IP sealing	IP65 and IP67
Vibration	MIL-STD-810 Method 514, Procedure I
Humidity	5–95% non-condensing
Altitude	MIL-STD-810 Method 500
Solar radiation	IEC60068-2-5 Procedure A

Salt fog	MIL-STD-810H Method 509.7
Electrostatic discharge (ESD)	±15 kV air discharge ±8 kV direct discharge ±8 kV indirect discharge
Connectivity	
Power supply options	Direct 12 VDC to 24 VDC via flying leads Zebra AC/DC IP67 Sealed Power Supply Zebra AC/DC Indoor Power Supply Zebra DC/DC IP67 Sealed Power Supply Power-over-Ethernet+ Injector (802.3at) Power-over-Ethernet Injector (802.3af)
Network connections	Gigabit Ethernet, WLAN, WPAN, WWAN 5G, CBRS
RFID characteristics	
Frequency range and maximum RF conducted output power — external antenna ports (all power options except PoE 802.3af)	US: 902–928 MHz; 0–33 dBm EU: 865–868 MHz; 0–33 dBm 916.3, 917.5, and 918.7 MHz; 0–33 dBm Japan: 916–921 MHz (w LBT); 0–33 dBm
Frequency range and maximum RF conducted output power — integrated antenna (all power options apply)	US: 902–928 MHz; 0–29 dBm EU: 865–868 MHz; 0–28.8 dBm 916.3, 917.5, and 918.7 MHz; 0–31.1 dBm Japan: 916–921 MHz (w LBT); 0–29.0 dBm
Frequency range and maximum RF conducted output power — external antenna ports (PoE)	US: 902–928 MHz; 0–31.5 dBm EU: 865–868 MHz; 0–31.5 dBm 916.3, 917.5, and 918.7 MHz; 0–31.5 dBm Japan: 916–921 MHz (w LBT); 0–31.5 dBm
Frequency range and RF system output — integrated antenna (all power options)	US: 902–928 MHz; 0–36 dBm (EIRP) EU: 865–868 MHz; 0–33 dBm (ERP) 916.3, 917.5, and 918.7 MHz; 0–36 dBm (ERP) Japan: 916–921 MHz (w LBT); 0–36 dBm (EIRP)
Antenna port configurations	Integrated antenna with 4 external antenna ports 4 external RP-TNC antenna ports 8 external RP-TNC antenna ports
Integrated RFID antenna gain	7 dBi
Integrated RFID antenna beamwidth	72°
Connectivity	
Network services	DHCP, HTTPS, FTPS, SFPT, SSH, HTTP, FTP, SNMP, NTP
Network stack	IPv4 and IPv6
Security	Transport Layer Security Ver 1.2, FIPS 140-2
Communications	2 USB host, USB client

General purpose input/output (GPIO)	4 inputs / 4 outputs
GPIO output voltage and current limit	+24 VDC input: +24 VDC/1A output +12 VDC input: +12 VDC/250 mA output PoE+ (802.3at): 24 VDC/250 mA output PoE (802.3af): n/a
Regulatory compliance	
Safety	UL 62368-1, IEC 62368-1, EN 62368-1
RFI/EMI/EMC	FCC Part 15, RSS210, RSS247, EN 302 208, EN 300 328, EN 300 440, EN 301 893, EN 303 413, EN 301 489-1/13/25, ICES-003 Class A, EN 301 489-1/3/17/19/52
SAR/MPE	FCC 47CFR2:OET Bulletin 65, EN 50364, EN 50566
Other	RoHS, WEEE
General certifications	TAA compliant
Surge (EN61000-4-5)	±4 kV

Markets and applications

Transportation and logistics

- Baggage tracking
- Cycle counting
- Item locating
- Cold chain
- Returnable transport object (RTO) tracking

Manufacturing

- Work in process (WIP) tracking
- Raw materials inventory
- Pipeline/utility tracking
- RTO tracking
- Manufacturing automation

Government

- Kitting
- Asset tracking
- Vehicle asset control
- Chain of custody
- Personnel control

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