

UHF | RAIN - Ultra Rugged Fixed Reader **Zebra - FXR90**

- RAIN RFID (UHF EPC Class1 Gen2, ISO 18000-63) compliant
- Up to 16 m reading range
- Ethernet, USB, 5G, WiFi, Bluetooth 5.3, GPS
- 4 inputs / 4 outputs
- IP67 protection



UHF | RAIN - Ultra Rugged Reader Rock-solid reliability

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.

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.

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.

Common Applications

- Inventory Control
- Manufacturing
- Baggage Tracking
- Vehicle Identification



TECHNICAL SPECIFICATIONS

Physical Characteristics

Dimensions	Without integrated RFID antenna (with flush mount brackets) 33.5 X 25.4 X 5.5 (cm) Without integrated RFID antenna (without flush mount brackets) 29.1 X 25.4 X 5.2 (cm) With integrated RFID antenna (with flush mount brackets) 33.5 X 25.4 X 7.38 (cm) With integrated RFID antenna (without flush mount brackets) 29.1 X 25.4 X 7.08 (cm)
Weight	Reader only (with flush mount bracket) 2.70 (kg) Reader only (without flush mount bracket) 2.50 (kg) Integrated Antenna Model (with flush mount bracket) 3.07 (kg) Integrated Antenna Model (without flush mount bracket) 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

User Environment

Operating Temperature	-40° C to 65° C
Storage Temperature	-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

System Characteristics

CPU	NXP iMX8 Mini Quad Cortex-A53
Operating System	Linux
Memory	2GB LP DDR4 RAM/16GB eMMC Flash
Cryptography	Transport Layer Security Ver 1.2, 1.3, FIPS 140-2

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
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	4 inputs/4 outputs
GPIO Output Voltage & 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

TECHNICAL SPECIFICATIONS

RFID Characteristics	
RFID Engine	Zebra Proprietary Radio Technology
Maximum RFID Read Rate	1,300+ tags/sec
Maximum RFID Read Range - Integrated Antenna*	30.5 (m)*Note: This read distance is with specific tag and setup
Nominal RFID Read Range - Integrated Antenna	16.7 (m)
Nominal RFID Write/Encode Range - Integrated Antenna	4.5 (m)
Maximum Receiver Sensitivity	-92 dBm
Air Protocols	ISO 18000-6C (EPC Class 1 Gen2V2)
Frequency Range and Maximum RF Conducted Output Power – Ext. 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 Beam width	72°

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

Part No. / Model	
	Zebra - FXR90 (FXR90010-400000-WR)