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ZEBRA FXR90 Fixed RFID Reader User Guide

Contents

ZEBRA FXR90 Fixed RFID Reader

Specifications

- Product: FXR90 Fixed RFID Reader
- Model Number: MN-004846-01EN-P Rev A
- Features: Real-time, seamless EPC-compliant tags processing for inventory management and asset tracking applications

Getting Started
This section provides information on FXR90 fixed RFID reader features, parts, and LED indications.

Features
The FXR90 fixed industrial RFID readers are based on Zebra's fixed reader platform and are easy to use, deploy, and manage. The reader offers a wide range of features that enable implementation of complete, high-performance, intelligent RFID solutions.

Parts

FXR90 Top Panel Connections:

1. WLAN (Wi-Fi) antenna 1
2. WWAN antennas (4G / 5G / GPS) (4)
3. USB (Host & Client)
4. GPIO
5. DC Power Input
6. 10/100/1000 Base-T Ethernet with POE+ (IEEE 802.3at compatible)
7. WLAN (Wi-Fi) / Bluetooth antenna 2

FAQ

Q: How do I contact Zebra Global Customer Support for the FXR90?

A: You can contact Zebra Global Customer Support for your region by visiting **zebra.com/support**.

Terms of Use

Proprietary Statement

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Limitation of Liability

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FXR90 Quick Reference Guide

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 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.

About This Guide

The FXR90 industrial fixed RFID readers provide real-time, seamless EPC-compliant tags processing for asset management in rugged industrial and enterprise environments.
The FXR90 supports Wi-Fi, Bluetooth, 1000BASE-T Ethernet, POE+ and optional 5G WAN, and offers 4-port, 8-port, and integral RFID antenna variants.
This Quick Reference Guide provides information about installing, configuring, and using the FXR90 RFID reader and is intended for use by professional installers and system integrators.

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 the user to know and that is not required to complete a task.
- IMPORTANT: The text here indicates information that is important for the user to know.
- CAUTION: If the precaution is not heeded, the user could receive a minor or moderate injury.
- WARNING: If danger is not avoided, the user CAN be seriously injured or killed.

Getting Started

This section provides information on FXR90 fixed RFID reader features, parts, and LED indications.

Features

The FXR90 fixed industrial RFID readers are based on Zebra's fixed reader platform and are easy to use, deploy, and manage.
The reader offers real-time, seamless EPC-compliant tags processing
for inventory management and asset tracking applications in large scale deployments. The reader offers a wide range of features that enable implementation of complete, high-performance, intelligent RFID solutions:

- Rugged construction for industrial markets such as manufacturing and transportation/logistics
- Suitable for indoor, outdoor, and vehicle-mounted use
- Wireless communication:
- 5G WAN/GPS with CBRS support
  - WWAN
  - Wi-Fi 6
  - Bluetooth
- NFC tag for tap-to-pair
- Industrial M12 connectors

- IP65 and IP67 sealed

- Operating temperature of -40°C to +65°C

- 4 and 8 antenna port options

- Optional integrated antenna with 4-port configuration

FXR90 Parts

Figure 1   FXR90 Top Panel Connections
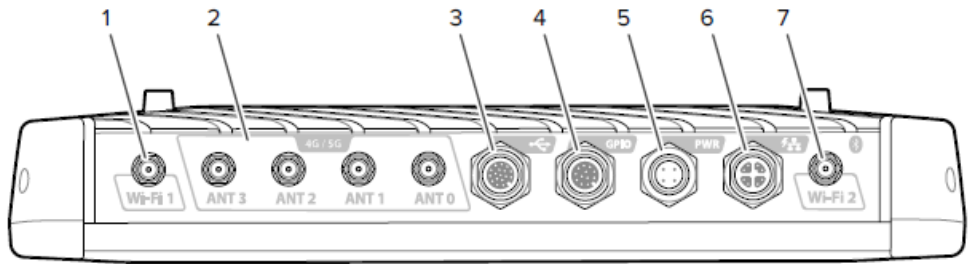
Table 1   FXR90 Top Panel Connections

1	WLAN (Wi-Fi) antenna 1
2	WWAN antennas (4G / 5G / GPS) (4)
3	USB (Host & Client)
4	GPIO
5	DC Power Input
6	10/100/1000 Base-T Ethernet with POE+ (IEEE 802.3at compatible)
7	WLAN (Wi-Fi) / Bluetooth antenna 2

Figure 2 FXR90 RFID Antennas
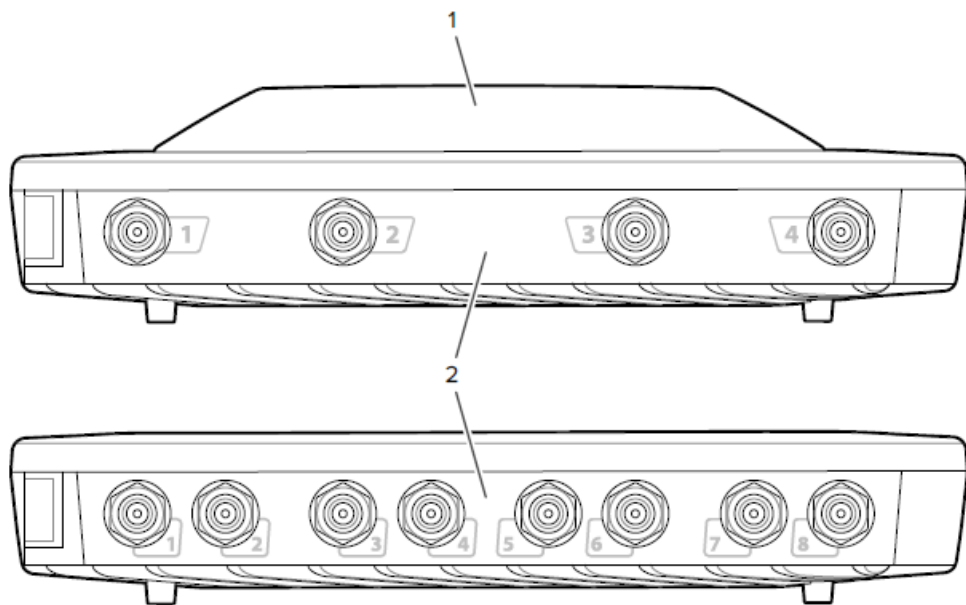
Table 2   FXR90 RFID Antennas

1	Integrated RFID antenna (optional)
2	RFID Antenna ports, RP-TNC (4 or 8)

FXR90 LEDs

The reader LEDs indicate reader status as described in the following table.

Figure 3   FXR90 LEDs

Figure 3 FXR90 LEDs

Table 3   FXR90 LED Indications

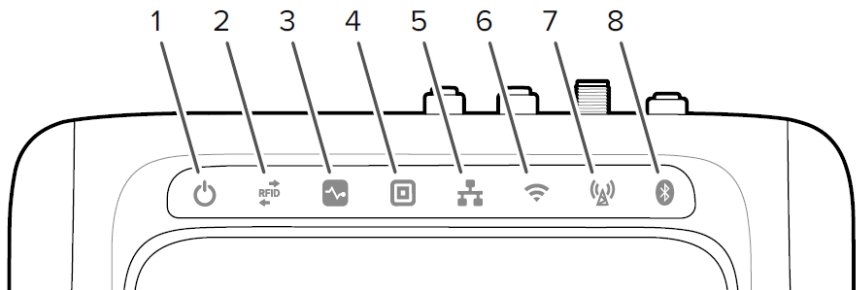|	Function	Color/Status
1	Power	Green = On Yellow = Application initialization / booting Red = Critical failure
2	Activity	Green flashing = Tag read Yellow flashing = Another tag operation Red flashing = Error in RF operation
3	Status	Green flashing = GPI event Yellow flashing = Firmware update Red = Firmware update failure

	Function	Color/Status
4	Application	Green Yellow Red Application Defined
5	Ethernet	Green flashing = 1000 Mbps link detected Yellow flashing = 100 Mbps link detected
6	WiFi	Green = Connected Green flashing = Connecting Red = Error/Lost connection
7	WAN (4G/5G)	Green = Connected Green flashing = Connecting Red = Error
8	Bluetooth	Blue = Connected Blue flashing = Pairing / Searching Red = Error/Lost connection

Installation and Communication

This section includes FXR90 RFID reader installation and communication procedures.

CAUTION: The FXR90 RFID reader must be professionally installed.
IMPORTANT: Only Zebra-approved cable assemblies should be used with the reader.

Unpacking the Reader
Remove the reader from the shipping container and inspect it for damage. Keep the shipping container; it should be used if the reader needs to be returned for servicing.

Flush Mounting the Reader
The FXR90 comes standard with two mounting brackets installed on the reader that allow for flush mounting of the reader to a surface. These brackets require four #8 mounting screws.

NOTE: For drywall applications, use correctly sized toggle bolts or drywall anchors.

Pre-drill the mounting surface according to the following dimensions. The mounting pattern is a rectangle measuring 310 mm by 100 mm (12.20 in x 3.94 in). The mounting surface must support the full device weight and the weight of any attached cables.

Figure 4   FXR90 Mechanical Dimensions

Figure 4 FXR90 Mechanical Dimensions
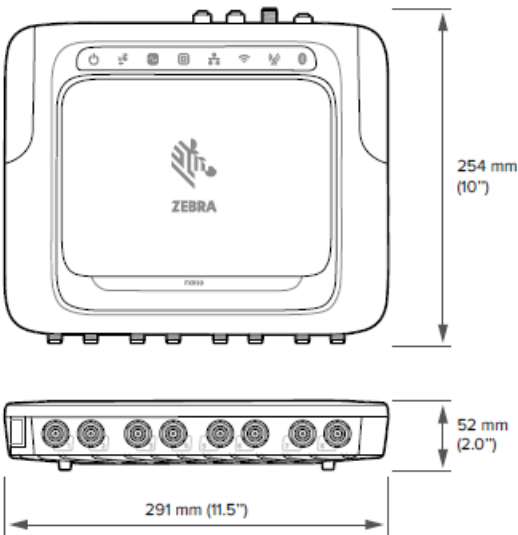
254 mm (10")

52 mm (2.0")

291 mm (11.5")

Figure 5 FXR90 Mechanical Dimensions with Brackets

254 mm (10")

55 mm (2.2")

335 mm (13.2")
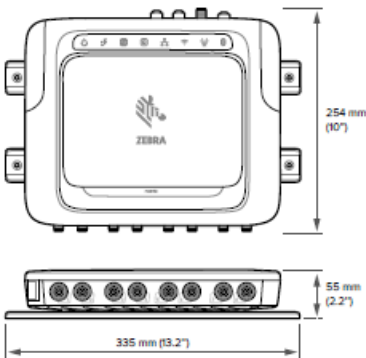
Figure 6 FXR90 Mechanical Dimensions with Antenna

254 mm (10")

70.8 mm (2.8")

291 mm (11.5")
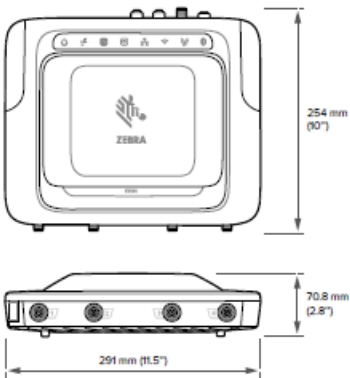
Figure 7 FXR90 Mechanical Dimensions with Antenna and Brackets

254 mm (10")

73.8 mm (2.9")

335 mm (13.2")
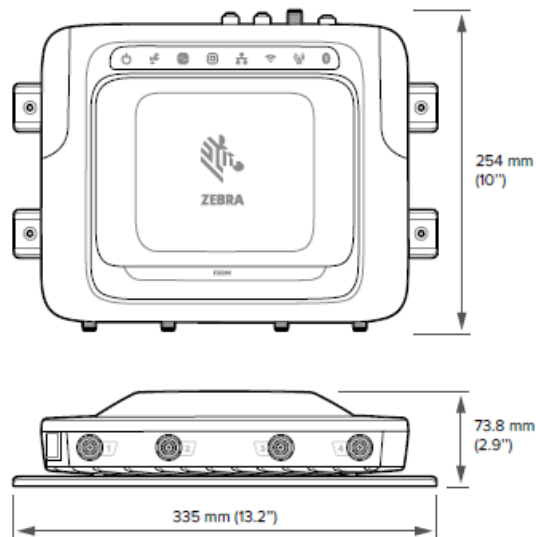
NOTE: The brackets can be rotated to support the reader's mounting in both vertical and horizontal orientations.

Figure 8   Bracket Orientations

Figure 8 Bracket Orientations
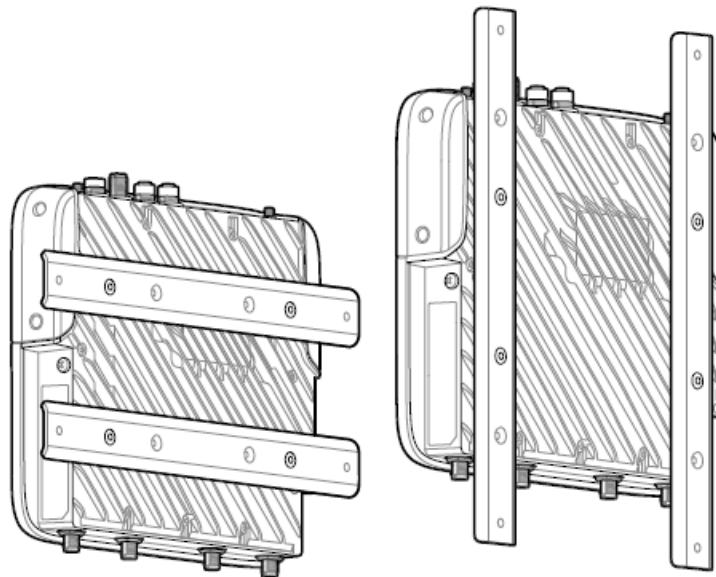
Mounting Tips

Mount the reader in any orientation. Consider the following before selecting a location for the reader.

- Mount the reader in an area free from electromagnetic interference. Sources of interference include generators, pumps, converters, non-interruptible power supplies, AC switching relays, light dimmers, and computer CRT terminals.
- Ensure that any cable losses between the reader and antenna are considered to ensure the desired level of system performance.
- Ensure that power can reach the reader.
- Ensure the reader is mounted in a location where it will not be easily disturbed, bumped, or damaged.
- Use a level for precise vertical or horizontal mounting.

VESA Mount
This section describes an external bracketing device that can be used to mount the FXR90 reader.
The VESA Mount (P/N: MNT-100100MM-01) is a heavy-duty articulating mounting bracket.
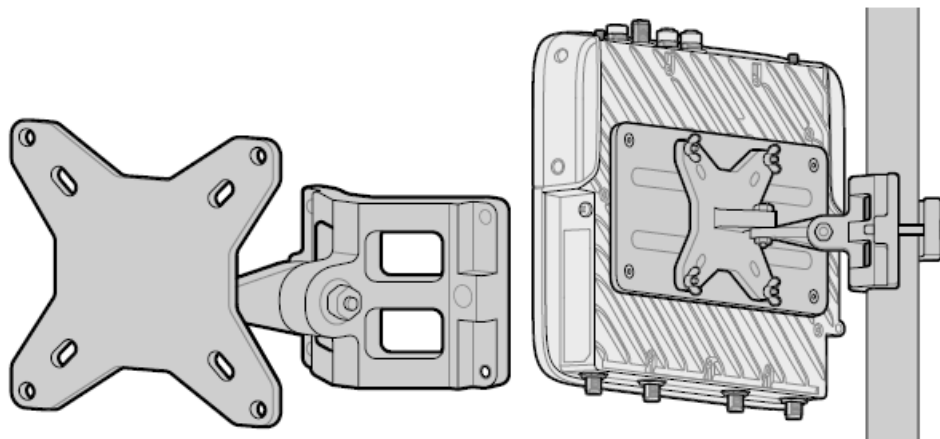
- The bracket can be used in both vertical and horizontal configurations.
- The bracket is suitable for indoor/outdoor use.
- The bracket is adjustable in both azimuth and elevation for the purpose of aiming the reader.
- The adaptor plate (P/N: ADP-200100MM-01) is assembled between the FXR90 and the VESA mounting bracket. To complete the assembly, one must adapt the 200mm x 100mm hole pattern on the FXR90 to the VESA mounting bracket's 100mm x 100mm hole pattern. Use the screws from the flush mount bracket to attach the adaptor plate.

Connecting Reader Antennas

To safely install the reader antennas

- IMPORTANT: The appropriate Zebra antennas provide optimal performance for various use cases. To meet optimum RF specifications, an antenna with maximum VSWR = 1.3 must be used.
- CAUTION: To ground the device, use the pre-installed #10-32 x 0.250″ grounding screw on the side of the device.
- IMPORTANT: The protective caps should remain on all connectors when not in use, especially for outdoor applications.
- WARNING: Follow all antenna installation and power connection instructions before operating the reader to avoid personal injury or equipment damage that may result from improper use. To safeguard personnel, be sure to position all antenna(s) according to the specified requirements for your regulatory region.
- CAUTION: Power off the reader before connecting antennas. Never disconnect the antennas while the reader is powered on or reading tags. This can damage the reader.
- Do not turn on the antenna ports from a host when the antennas are not connected.
- Maximum antenna gain (including any cable loss) cannot exceed 6.7 dBiL. Ensure that the device is correctly set to the country where the reader is being used to assure regulatory compliance.
- When mounting the antennas outside the building, equipment shall permanently connect to building earth (ground) by a skilled person. Perform this in accordance with applicable national electrical installation codes.
- To connect the antennas to the reader, attach the RP-TNC connector coming from each antenna to an antenna port and secure the cable using wire ties. Do not bend the cable beyond the rated bend radius.

Communication and Power Connection
Use a standard PoE or PoE+ connection for the reader to a host or network.

IMPORTANT: The protective caps should remain on all connectors when not in use, especially for outdoor applications.

Ethernet Connection
The reader communicates with the host using an Ethernet connection (10/100/1000 Base-T Ethernet cable). This connection allows access to the Administrator Console used to change reader settings and control the reader. With a wired Ethernet connection (10/100/1000 Base-T cable) power using either the approved reader Zebra power supply or by Power-Over-Ethernet through the Ethernet cable.

Ethernet: Power via External Power Supply

The FXR90 RFID reader communicates to the host through a 10/100/1000 Base-T Ethernet cable and receives power through a Zebra power supply.

1. Select the 1m, 3m, 5m, or 15m Ethernet cable.
2. Connect the Ethernet cable to the FRX90 Ethernet M12 connector.
3. Connect the other end of the Ethernet cable to the host system LAN port.
4. Assemble the power supply cable connector to the reader.
5. Route the power cable.
6. Connect the FXR90 Zebra AC power supply to a wall outlet.
7. Verify that the unit booted properly and is operational.
8. On a networked computer, open an internet browser and connect to the reader.
9. Log into the Administrator Console.

Ethernet: Power via PoE or PoE+
The PoE installation option allows the reader to communicate and receive power on the same 10/100/1000 Base-T Ethernet cable.

1.   Select the 1m, 3m, 5m, or 15m Ethernet cable.
2. Connect the Ethernet cable to the FRX90 Ethernet M12 connector.
3. Connect the other end of the cable to an Ethernet network with PoE or PoE+ capability.
4. Verify that the reader booted properly and is operational.
5. On a networked computer, open an internet browser and connect to the reader.
6.   Log into the Administrator Console.

USB Connection
The USB port supports (by default) a Network mode of operation. This enables a secondary network interface as a virtual network adapter over USB.
The Ethernet network interface co-exists with the USB virtual network adapter. However, only one application connection (RFID connection or web console connection) is allowed at any time. Go to Zebra USB RNDIS Driver for installation instructions.

IMPORTANT: The protective caps should remain on all connectors when not in use, especially for outdoor applications.

Zebra USB RNDIS Driver

To use the USB virtual network adapter, install the Zebra USB Remote Network Device (RNDIS) driver and enable the driver on the reader.

To install the RNDIS driver on the host:

1. Download the installer file Zebra RNDIS.msi from **zebra.com/support** to the host PC.
2. Select this file on the host PC to install the host-side drivers for the USB Remote Network Device Interface.
3. Connect a USB cable between the host and the reader. The Welcome to the Found New Hardware Wizard screen displays.
4. Select the No, not this time radio button and select Next.
5. Select the default option. Install Software Automatically (Recommended).
6. In the hardware installation dialog box window, select Continue Anyway.
7. Select Finish to complete the installation. This assigns the host an auto-configured IP address. The network is now ready to use, and the reader's IP address is fixed to 169.254.10.1.

GPIO Interface Connection

The GPIO connection allows up to 4 inputs, 4 outputs and supplies +24 VDC for external sensors and signaling devices. The GPIO interface is electrically isolated from the reader's chassis ground, but its ground is common to the power return of the 24 VDC external supply when this is present.

Regulatory Information

This device is approved under Zebra Technologies Corporation.
This guide applies to the following model numbers:

- FXR9000
- FXR9001
- FXR9011

All Zebra devices are designed to be compliant with the rules and regulations in the locations they are sold and will be labeled as required.
Any changes or modifications to Zebra equipment not expressly approved by Zebra could void the user's authority to operate the equipment.

- Declared maximum operating temperature: 65°C
- CAUTION: Only use Zebra approved and NRTL-certified accessories, battery packs, and battery chargers.
- Do NOT attempt to charge damp/wet mobile computers, printers or batteries. All components must be dry before connecting to an external power source.
- WARNING: This is a Class A ITE product. Operation in a residential environment could cause radio interference.

Bluetooth® Wireless Technology
This is an approved Bluetooth® product. For more information on the Bluetooth SIG listing, please visit **www.bluetooth.com**.

Regulatory Markings
Regulatory markings subject to certification are applied to the device. Refer to the Declaration of Conformity (DoC)

for details of other country markings. The DOC is available at: **zebra.com/doc**.

Health and Safety Recommendations
This section provides important health and safety recommendations.

Vehicle Installation
RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles (including safety systems). Check with the manufacturer or its representative regarding your vehicle. Ensure the equipment is installed to avoid driver distractions. You should also consult the manufacturer about any equipment that has been added to your vehicle.
Position the device within easy reach. User should be able to access the device without removing their eyes from the road.

IMPORTANT: Before installing or using, check national and local laws regarding distracted driving.

Safety on the Road
Give your full attention to driving. Obey the laws and regulations on the use of wireless devices in the areas where you drive.
The wireless industry reminds you to use your device / phone safely when driving.

Restricted Use Locations
Remember to observe restrictions and obey all signs and instructions on the use of electronic devices in restricted use locations.

Safety in Hospitals and Aircraft

 Wireless devices transmit radio frequency energy that may affect medical electrical equipment and aircraft operation. Wireless devices should be switched off wherever you are requested to do so in hospitals, clinics, healthcare facilities, or by airline staff. These requests are designed to prevent possible interference with sensitive equipment.

Medical Devices
It is recommended that a minimum separation distance of 20 cm (8 inches) be maintained between a wireless device and medical devices such as pacemakers, defibrillators, or other implantable devices to avoid potential interference with the medical device. Pacemaker users should keep the device at the opposite side of the pacemaker or turn OFF the device if suspected of interference.
Please consult your physician or the manufacturer of the medical device to determine if the operation of your wireless product may interfere with the medical device.

RF Exposure Guidelines

CAUTION: Important Safety Information

Reducing RF Exposure – Use Properly
Only operate the device in accordance with the instructions supplied.
The device complies with internationally recognized standards covering human exposure to electromagnetic fields. For information on international human exposure to electromagnetic fields, refer to the Zebra Declaration of Conformity (DoC) at **www.zebra.com/doc**.
Use only Zebra tested and approved headset, belt-clips, holsters, and similar accessories to ensure RF exposure compliance. If applicable, follow the instructions for use as detailed in the accessory guide.

The use of third-party belt clips, holsters, and similar accessories may not comply with RF exposure compliance requirements and should be avoided.

For further information on the safety of RF energy from wireless **www.zebra.com/responsibility** devices, refer to RF exposure and assessment standards section at .

To satisfy RF exposure requirements, this device must operate with a minimum separation distance of 30 cm or more from a user's body and nearby persons.

Power Supply

This device may be powered by either an external power supply or Power over Ethernet (PoE) 802.3af or 802.3at power source. Ensure the applicable instructions are followed.

WARNING: ELECTRICAL SHOCK Use only a Zebra approved, Certified ITE [LPS] power supply with appropriate electrical ratings. Use of alternative power supply will invalidate any approvals given to this unit and may be dangerous.

This device must be powered from a 802.3af or 802.3at compliant power source which meets local compliance requirements.

Marking and European Economic Area (EEA)

Statement of Compliance

Zebra hereby declares that this radio equipment is in compliance with Directives 2014/53/EU and 2011/65/EU. Any radio operation limitations within EEA countries are identified in Appendix A of EU Declaration of Conformity. The full text of the EU Declaration of Conformities is available at: **zebra.com/doc**

EU Importer : Zebra Technologies B.V

Address: Mercurius 12, 8448 GX Heerenveen, Netherlands

Environmental Compliance

For compliance declarations, recycling information, and materials used for products and packaging, please visit **www.zebra.com/environment**

Waste Electrical and Electronic Equipment (WEEE)

For EU and UK Customers: For products at the end of their life, please refer to recycling/disposal advice at: **www.zebra.com/weee**.

United States and Canada Regulatory

Radio Frequency Interference Notices

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and

2. this device must accept any interference received including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Radio Frequency Interference Requirements – Canada

Innovation, Science and Economic Development Canada ICES-003 Compliance Label: CAN ICES-003 (A)/NMB-003(A)

This device complies with Innovation, Science and Economic Development Canada's licence-exempt RSSs. Operation is subject to the following
two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This device is restricted to indoor use when operating in the 5150 to 5350 MHz frequency range.
This radio transmitter 109AN-FXR9000,109AN-FXR9001,109AN-FXR9011 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list and having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

- Antenna 1 ID: WLAN
- Dipole: 4.37 dBi, 50 ohms
- Antenna 2 ID: RFID
- Patch: 6.7 dBi, 50 ohms

RF Exposure Requirements – FCC and ISED
The FCC has granted Equipment Authorization for this device with all reported SAR levels evaluated in compliance with the FCC RF emission guidelines. SAR information on this device is on file with the FCC and can be found under the Display Grant section of **www.fcc.gov/oet/ea/fccid**
To satisfy RF exposure requirements, this device must operate with a minimum separation distance of 30 cm or more from a user's body and nearby persons.
To ensure compliance with FCC/ISED RF exposure requirement, the user shall keep the front of the RFID Device transmitting antenna at least 30 cm away from any nearby persons.

Hotspot Mode
To satisfy RF exposure requirements in hotspot mode, this device must operate with a minimum separation distance of 30.0 cm or more from a user's body and nearby persons.

Mobile Devices
This equipment complies with RF Exposure limits established for an uncontrolled environment (General Population). This equipment should be installed and operated in such a way that a separation distance of greater than 30 centimeters is maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

Remote and Standalone Antenna Configurations
To comply with FCC/ISED RF exposure requirements, antennas that are mounted externally at remote locations or operating near users at stand-alone desktop or similar configurations must operate with a minimum separation distance of 30 cm from the user or nearby persons.

Co-located Statement
To comply with FCC RF exposure compliance requirement, the antenna used for this transmitter must not be co-located (within 20 cm) or operating in conjunction with any other transmitter/antenna except those already approved in this filling.

Hotspot ISED Notice
When operating in hotspot mode, this device is restricted to indoor use when operating in the 5150 – 5350 MHz frequency range.
En mode de connexion partagée (hotspot), l'utilisation de cet appareil doit se faire exclusivement en extérieur lorsqu'il fonctionne dans la plage de fréquences 5 150 – 5 350 MHz.

The maximum antenna gain permitted for devices in the bands 5250 -5350 MHz, 5470 – 5725 MHz and 5725 – 5850 MHz shall be such that the equipment still complies with the Effective Isotropic Radiated Power (EIRP) limit.

UL Listed Products with GPS
Underwriters Laboratories Inc. (UL) has not tested the performance or reliability of the Global Positioning System (GPS) hardware, operating software, or other aspects of this product. UL has only tested for
fire, shock, or casualties as outlined in UL's Standard(s) for Safety for Information Technology Equipment. UL Certification does not cover the performance or reliability of the GPS hardware and GPS operating software. UL makes no representations, warranties, or certifications whatsoever regarding the performance or reliability of any GPS related functions of this product.

Singapore
End-users are required to obtain a site licence from the Infocomm Media Development Authority ("IMDA") to operate RFID equipment in Singapore such as Zebra fixed and mobile RFID readers. For further information on this licensing requirement and the application process, end-users may contact IMDA (Tel: 6211 0647).

United Kingdom

Statement of Compliance
Zebra hereby declares that this radio equipment is in compliance with the Radio Equipment Regulations 2017 and the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012.
Any radio operation limitations within UK are identified in Appendix A of UK Declaration of Conformity.
The full text of the UK Declaration of Conformities is available at: **zebra.com/doc**.
UK Importer: Zebra Technologies Europe Limited
Address:
Dukes Meadow, Millboard Rd, Bourne End, Buckinghamshire, SL8 5XF

www.zebra.com

Documents / Resources

ZEBRA FXR90 Fixed RFID Reader [pdf] User Guide
FXR90 Fixed RFID Reader, FXR90, Fixed RFID Reader, RFID Reader, Reader

References

- **User Manual**

Manuals+, Privacy Policy

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