FX Series Version 3.21.21 Release Notes

This document summarizes the following firmware release:

Firmware Release Number	Release Date	See page
V3.21.21	31-August-2022	Page 1

For support, please visit www.zebra.com/support

FX Series Release V3.21.21

Release Date: 31-August-2022

Zebra's Fixed reader series comprises of the following readers

1. FX7500 Fixed RFID Reader
2. FX9600 Fixed RFID Reader

Both readers are Linux-based devices driven by powerful RFID engine that enables users to integrate RFID into their business logic and applications with great ease and high efficiency.

Due to Key changes in some licensed components, and introduction of a new firmware update process, downgrading to previous releases (v3.20.x or lower) IS NOT SUPPORTED once the reader is updated to 3.21.x

Please review IMPORTANT NOTES ABOUT FIRMWARE UPDATE on pages 4-5.

V3.10.30 and above mandates that the user changes the default admin password during first login to web console. The reader web console directs the user to switch to https and then change the password before any further configuration. Also please ensure that the browser cache is cleared to remove cached web pages. This is important to ensure that the web console enhancements are available for use.

For a friendly user experience, it is recommended to use the 123RFID Desktop utility available from the Zebra support site or to configure the reader using FX Connect (available via license). For an evaluation license of FX Connect, please contact your Zebra sales representative.

Release Notes lists new features, any specific usage instructions, and any known issues.

The current build, FX Series 3.21.21, is applicable to both FX9600 and FX7500 readers.

The features and the issues mentioned in this document are applicable for all FX9600 and FX7500 SKUs

Note: The version 3.21.21 software update package includes the files required to update FX9600 and FX7500 RFID Readers.

End Of Life

As of this release, the support for FxConnect and RCI is fully withdrawn. The IoT Connector will subsume these functionalities. For More information refer to the FxConnect to IoTConnector Migration guide.

Contents of the release package:

IMAGE TYPE	VERSION	FILE NAME	DATE
RM Server LLRP Server	3.21.21 3.21.21	platform_3.21.21.0.jffs2	8/31/2022
X-Loader	4.0.0	x-load_4.0.0.0.bin.ift	08/26/2018
U-Boot	3.17.6	u-boot_3.17.6.0.bin	8/31/2022
Operating System	3.20.1	uImage_3.20.1.0	8/31/2022
Root FS	3.20.5	rootfs_3.20.5.0.jffs2	8/31/2022
OsUpdate Utility	1.0.0	osupdate.elf	8/31/2022
FxUpdate Utility	1.0.0	fxupdate.elf	8/31/2022
Response	N/A	response.txt response_ext.txt	8/31/2022
Linux Kernel	4.9.182		
Radio Firmware	2.1.49 (FX9600) 1.4.88 (FX7500)		
Radio API	2.2.34.0		
EtherNet/IP	1.0.11	zebraethernetip_1.0.11.deb	02/10/2022
Profinet	1.0.2	ZebraProfinetApp_1.0.2.zip	02/10/2022
Modbus	1.0.2	ZebraModbusApp_1.0.2.zip	02/10/2022

IOT Connector Components Version Info:

IMAGE TYPE	VERSION	FILE NAME	DATE
IOT Connector Debian Package	2.8.9	ZIOTC_2.8.9.zip	08/31/2022
Cloud Agent	0.5.0.9	Cloud_agent.elf	08/31/2022
Radio Control	0.2.53.0	radio_control.elf	08/31/2022

Note – All the SDKs (Host & Embedded) are available in Zebra support site.

Host API release Version Info:

IMAGE TYPE	VERSION	FILE NAME	DATE
RFID3 C API DLL	5.5.6.3	RFIDAPI32PC.DLL	May 2021
RFID3 .NET DLL	1.5.6.2	Symbol.RFID3.*.dll	May 2021
RFID3 Java JNI DLL	1.4.0.49	RFIDAPI3_JNI_HOST.dll	May 2021
RFID3 Java API	1.4.0.49	Symbol.RFID.API3.jar	May 2021
123RFID Desktop	1.3.0.0	123RFID_Desktop_v1.3.0.0	Sep 2020

Native DLL's available for 64-bit.

Host SDK:

DESCRIPTION	VERSION	FILE NAME	DATE
Zebra RFID FXSeries Host C SDK for Windows 7 and 10	V1.0.5	Zebra-RFID-FXSeries-Host-C-SDK_v1.0.5.msi	May 2021
Zebra RFID FXSeries Host .NET SDK for Windows 7 and 10	V1.0.5	Zebra-RFID-FXSeries-Host-DotNet-SDK_V1.0.5.msi	May 2021
Zebra RFID FXSeries Host Java SDK for Windows 7 and 10	V1.7	Zebra-RFID-FXSeries-Host-Java-SDK_V1.6.msi	May 2021
Zebra RFID C and Java SDK for 64 bit Host Linux (CentOS & Ubuntu)	V5.5.4.16 V1.4.0.49	Linux64_SDK_C_V5_5_4_19_JAVA_v1_4_0_49.tar.gz	10/02/2021

Embedded SDK:

DESCRIPTION	DOCUMENTATION	FILE NAME	DATE
Zebra Native Java SDK on Windows 7 Zebra Native Java SDK on Windows 10	Zebra-FXSeries-Embedded-Java-SDK-UserGuide_Windows.docx	Zebra-FXSeries-Embedded-SDK-Java-Windows_V1.0.1.zip	May 2020
Zebra Java SDK for Linux	Zebra-FXSeries-Embedded-Java-SDK-UserGuide_Linux.docx	Zebra-FXSeries-Embedded-SDK-Java_Linux_V1.0.1.tar.gz ZebraFXSeriesEmbeddedSDKJavaLinux_1.0.1.deb	May 2020
Zebra C / CPP SDK for Linux	Zebra-FXSeries-Embedded-C-CPP-SDK-UserGuide_Linux.docx	Zebra-FXSeries-Embedded-SDK-C-CPP_Linux_V1.0.1.tar.gz ZebraFXSeriesEmbeddedSDKCCPPLinux_1.0.1.deb	May 2020

Installation Instructions

There are multiple supported ways to upgrade the FX Series RFID readers.

Method 1 – USB Flash Drive:

This is the recommended method. Unzip images and copy to a USB drive. Connect USB drive to the FX Series reader. Upgrade will automatically start in 7-10 seconds.

Method 2 – 123RFID Desktop:

Zebra 123RFID Desktop utility can be used to update the firmware on FX Series readers using a simple and intuitive 3 step process.

The latest 123RFID Desktop can be downloaded from

https://www.zebra.com/us/en/support-downloads/software/utilities/123rfid.html

Refer to the video for help on updating the reader firmware using 123RFID Desktop

https://www.youtube.com/watch?v=NNDBPghjOg8&list=PLrcZVTwQp0ldXdysFQHwql9FyoBNuApfM&index=5&t=0s

✓ 123RFID can also be used to upgrade multiple readers with a single operation.

Method 3 – Web Interface:

Copy images to the local drive of a local PC, log in to the reader, select 'File based upgrade' on reader upgrade webpage, Enter username and password of reader. Select image to upgrade from the local PC. Click 'Start upgrade'. If the reader firmware is older than version 2.7.19, please ensure to execute a two-step update. First update to version 2.7.19 and then to this new version.

✓ The recommended browsers are IE11, Edge, Mozilla Firefox and Chrome v68 or newer.

Method 4 – FTP Server:

Copy images to an FTP server. Navigate to the reader upgrade webpage and select 'FTP upgrade' page. Enter username and password of the FTP server. 'Start upgrade'.

✓ FTP/SCP/FTPS server can be used to upgrade the readers.

HARDWARE REQUIREMENTS

- FX7500 & FX9600 (all SKUs)
- A USB drive if performing the update using Method #1

IMPORTANT NOTES ABOUT FIRMWARE UPDATE TO V3.21.21

- **Admin Users will now be forced to change the password during first login.**
- **Due to the changes in key licensed components and introduction of a new firmware update process, downgrades to previous releases are <u>not supported</u> once the reader is updated to V3.21.x or above.**
- **Readers will not allow revert-back to older firmware (older than V3.21.x) once the reader is updated to the current firmware. The revert-back feature will be available when the reader is updated a second time, the revert function will only revert to the lowest 3.21.x version.**
- When using file-based update it is recommended to clear the cached pages and reload the pages of the web console to ensure that the reader upgrades properly.
- If the reader is upgraded/downgraded from/to any other version prior to V3.0.35, then some of the UI pages will not work properly due to cached pages from previous build. Hence it is required to clear the browser cache after any upgrade/downgrade.
- Both the FX7500 and FX9600 readers can be upgraded from V2.7.19 or above using the firmware update mechanisms mentioned in the Installation Instructions.
- When upgrading from older versions (prior to V2.7.19) using file-based methods, it is recommended to upgrade to V2.7.19 first and then upgrade to the current version.

ENHANCEMENTS / CHANGES in 3.21.21 over 3.10.30

IoT Connector Enhancements

- Support for configuring the IOT Connector operating mode from web console.
- Support for configuring GPIO-LED module configuration from web console.
- Support in web console to configure Batching and Data Retention for IoT Connector endpoints.
- Support for configuring two data endpoints in IoT Connector to send data simultaneously.
- Support for IoT Connector Python and NodeJS DA library.
- Support in IoT Connector to send GPIO status in heartbeats.
- Migration of FxConnect HTTP POST functionality to IoT Connector in web console.
- Added Keyboard Emulation and USB Flash Drive endpoints in IoT Connector.
- Added VerifyPeer and VerifyHost fields for MQTT endpoints for IoT Connector

Security Updates

- Enabled Authentication for IoTvConnector local REST Interface. The /cloud/localRestLogin API will accept the basic auth credentials and return a token which should be included in the subsequent /cloud API requests.
- Updated Apache version to 2.4.52
- Update NTP version to 4.2.8p15
- Updated paho mqtt c library from 1.3.8 to 1.3.9
- Fix for changes for adding mode 6 query restrict as per CVE 97861.
- Security fixes to remove exe permissions for other users for sensitive applications.

Platform Updates

- Support for import CA certs into the reader via RM.
- Support for importing certificates by copying the certs into the reader and providing the path in the import cert RM command.
- Preliminary support for Phone Home functionality. The reader will out of the box reach out to a predefined URL to retrieve the IOT Connect configuration information.
- Reader configuration has been modified to use the default NTP as pool.ntp.org
- Ability to disable named services (Avahi/NetBIOS/RDMPAgent)

Regulatory Changes

- Regulatory support for South Africa (SANS/EN 302.208 and "FCC15 FHSS)
- Support for Egypt regulatory in E8 SKU

Issues Addressed in 3.21.21 over 3.10.30

- Fix for memory leak in RM server when connected to LLDP network setups.
- SPR 45274 – Fix for FX7500 security issues (CVE 148367, 150280, 150244, 12218 and 97861) related to Apache, mDNS and NTP services on the reader
- SPR 46160 – Fix for security issues in Apache(156255)
- SPR 46656 – Fix for FX9600 Not detecting detached antennas.

Known Issues

- After mapping the Keyboard Emulation to a data endpoint in IoTConnector, If the Line ending needs to be changed, Users will need to, after changing the line ending, map the data endpoint to None and click on update, and then change the data endpoint back to keyboard emulation.
- Idle Mode time out is not used by IOT Connector and should be set to 0 ensuring that the radio stays powered on before connecting to cloud. If the reader was configured with V3.1.12 Idle mode timeout defaults to "10" seconds. It is recommended to change this to 0 first to disable the Idle mode before Enrolling to Cloud.
- Rare occurrence of "Self-Signed Certificate error" is shown in the webpage when in http mode (it is a false alarm). There is no loss of functionality due to this issue and can be ignored.
- CPU Usage is higher than V3.6.28 when reading tags using the web console due to enablement of high-resolution timer.
- Antenna status in web console is not updated with the antenna connect status when the reader is connected to cloud. The antenna status can be retrieved by the cloud app as part of get status API.
- RM Server does not indicate that the reader is dis-enrolled or dis-connected from Cloud if it is done outside the reader.

ADDITIONAL NOTES

Summary of major issues and limitations are listed below.

- **Cable loss compensation is being used to aid in the detection of Antenna presence. As part of deployment it is required to set the Cable length and loss appropriately**.
- If the admin user password is changed it will be necessary to install the latest versions of EtherNet/IP, Profinet and Modbus packages.
- Since the Reader will only accept zebra signed firmware, downgrades to previous releases are not supported.
- Reader will not allow revert back to older firmware (Older than V3.8.x) once the reader is updated to the current firmware.
- When updating the reader to 3.8.x it is necessary to clear the browser cache to use the pages that use Node JS. Some of the web pages that need this are ReadTags, Advanced Antenna Configuration, FXConnect, Serial configuration, Syslog.
- If reader is upgraded/downgraded from/to any other version prior to 3.0.35, then some UI pages will not work properly due to cached pages from previous build. Hence it is required to clear the browser cache after any upgrade/downgrade.
- User applications installed on older release (2.7.x, 2.6.x etc.) will not execute on 3.x build. Users will have to recompile their apps using the new tool chain.

- Applications that use RFID3 API to perform reader firmware update must use RFID3 API for C dll version 5.5.2.15. There is no need to recompile the app as the dll signature has not changed.
- For Keyboard Emulation under FX Connect feature, Data Suffix and Data Prefix will work for lower-case alphabets only other special characters may not work.
- Tag Data from Keyboard Emulation uses all lower-case alphabets.
- In Reader Wireless Settings Parameter web page, WIFi signal strength is always shown as 100%. To read the correct strength, refer to the ESSID field
- Number of rounds stop trigger when more than one antenna is enabled does not stop reads after N rounds
- LLRP in secure mode will prevent the Read Tags, Advanced Antenna Config, Serial port communication and Zebra FX Connect web pages from functioning properly. To use the above functionality, it is recommended to set LLRP to non-secure mode to use these features. There is no security risk as the non-secure connection is internal to the reader.
- Serial Port configuration (including BaudRate, StopBits, DataBits, Flowcontrol and Parity) and Mode of usage (Debug, Push Data or free Port) changes need reader reboot before these changes take effect. However, the Tag reporting and inventory settings in push data mode take effect immediately without reboot.
- After changing serial port configuration, banner message "reboot required" is not consistent. It is recommended to follow above note whenever serial port configuration is changed.
- Large file names are not supported when importing reader configuration in Reader Profiles web page
- It is not possible to disable GPI function as defined in the LLRP standard. It is simply recommended to just not use the GPI function if it is not needed for a use case.
- RFSurvery is not supported in FXSeries Readers even though the LLRP capability reports true for canDoRFSurvey.