

FX Series Version 3.6.28 Release Notes

This document summarizes the following firmware releases:

Firmware Release Number	Release Date	See page
V3.6.28	15-July-2020	Page 1

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

FX Series Release V3.6.28

Release Date: July 15, 2020

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.

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 3.6.28, is aimed at 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 3.6.28 software update package includes the files required to update FX9600 and FX7500 RFID Readers.

Contents of the release package:

IMAGE TYPE	VERSION	FILE NAME	DATE
RM Server	3.6.28	platform_3.6.28.0.jffs2	07/15/2020
LLRP Server	3.6.28		
X-Loader	4.0.0	x-load_4.0.0.0.bin.ift	08/26/2018
U-Boot	3.0.13	u-boot_3.0.13.0.bin	01/14/2019
Operating System	3.6.5	ulmage_3.6.5.0	07/15/2020
Root FS	3.6.14	rootfs_3.6.14.0.jffs2	07/15/2020
OsUpdate Utility	1.0.0	osupdate.elf	07/15/2020

FxUpdate Utility	1.0.0	fxupdate.elf	07/15/2020
Response	N/A	response.txt response_ext.txt	07/15/2020
Linux Kernel	4.9.182		
Radio Firmware	2.1.29 (FX9600) 1.4.84 (FX7500)		
Radio API	2.2.10.1		

Host API release Version Info:

IMAGE TYPE	VERSION	FILE NAME	DATE
RFID3 C API DLL	5.5.4.14	RFIDAPI32PC.DLL	07/15/2020
RFID3 .NET DLL	1.5.1.21	Symbol.RFID3.*.dll	07/15/2020
RFID3 Java JNI DLL	1.4.0.44	RFIDAPI3_JNI_HOST.dll	07/15/2020
RFID3 Java API	1.4.0.44	Symbol.RFID.API3.jar	07/15/2020
123RFID Desktop	1.2.0.4	123RFID_Desktop_v1.2.0.4	May 2020

Native DLL's available for 64-bit. 32-bit RFID C Dll will be provided on request.

Host SDK:

DESCRIPTION	VERSION	FILE NAME	DATE
Zebra RFID FXSeries Host C SDK for Windows 7 and 10	V1.0.3	Zebra-RFID-FXSeries-Host-C-SDK_v1.0.3.msi	07/15/2020
Zebra RFID FXSeries Host .NET SDK for Windows 7 and 10	V1.0.3	Zebra-RFID-FXSeries-Host-DotNet-SDK_V1.0.3.msi	07/15/2020

Zebra RFID FXSeries Host Java SDK for Windows 7 and 10	V1.5	Zebra-RFID-FXSeries-Host-Java-SDK_V1.5.msi	07/15/2020
Zebra RFID C and Java SDK for 64 bit Host Linux (CentOS & Ubuntu)	V5.5.4.14 V1.4.0.44	Linux64_SDK_C_V5_5_4_14_JAVA_v1_4_0_44.tar.gz	07/15/2020

Embedded SDK:

DESCRIPTION	DOCUMENTATION	FILE NAME	DATE
Zebra Native Java SDK on Windows 7	Zebra-FXSeries-Embedded-Java-SDK-UserGuide_Windows.docx	Zebra-FXSeries-Embedded-SDK-Java-Windows_V1.0.1.zip	07/15/2020
Zebra Native Java SDK on Windows 10			
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	07/15/2020
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	07/15/2020

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 the contents of the folder 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.

Latest 123RFID Desktop can be downloaded from

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

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

<https://www.youtube.com/watch?v=NNDBPghjOg8&list=PLrcZVTwQp0ldXdysFQHwqI9FyoBNuApfM&index=5&t=0s>

Method 3 – Web Interface:

Copy images to local drive of 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 local PC. Click 'Start upgrade'. This method **should not** be used if updating from an old version. If you must use this method, please ensure to execute a two-step update. First update to version 2.7.19 and then to this new version.

Method 4 – FTP Server:

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

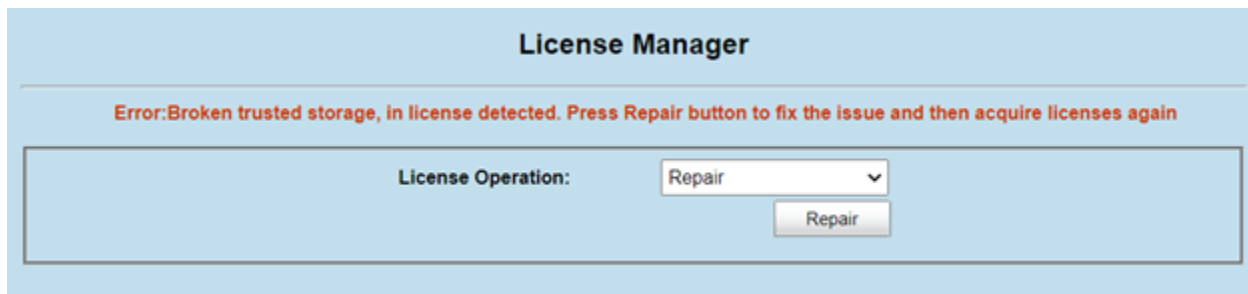
- ✓ FTP/SCP/FTPS server can be used to upgrade the readers.
- ✓ 123RFID can also be used to upgrade multiple readers with a single operation.

HARDWARE REQUIREMENTS

- FX9600 & FX7500 All SKUs
- A USB drive can also be used directly to initiate the upgrade process. The recommended browsers are Edge, IE11, Mozilla Firefox and Chrome V68

ENHANCEMENTS / CHANGES over V3.6.25 (FX9600 specific release)

- Changes to prevent "License Binding Break" error when upgrading firmware.
- Support for indicating error on the License Page of web console in case of "Binding Break" of license and option to "Repair License" using web Console. The user can check this in the License page of the reader web console and repair the same before acquiring the license as shown below.



- Changes in Embedded C API to use the files (if present) from /var/volatile when using Install User Application.

ENHANCEMENTS / CHANGES over V3.1.12 (Applicable for FX7500 and FX9600)

- Added ETSI 900 MHz support for FX9600 Readers:

Countries with 916.3, and 917.5 MHz support:
Liechtenstein; Switzerland

Countries with 916.3, 917.5, and 918.7 MHz support:
Austria; Croatia; Cyprus; Denmark; Estonia; Hungary; Ireland; Luxembourg; Moldova;
Norway; Slovakia; Slovenia; Ukraine; United Kingdom; Russia
- Default (automac) Link Profile for ETSI regulatory automatically adjusted when 900Mhz channels are enabled
- Optimized CPU utilization for data in transition.
- Update FX9600 firmware to V2.1.29 to improve write operations to UCODE based tags
- Support for Network Connect in FX9600 - EtherNet/IP:
 - Requires a license: permanent SKU FXNCEIP-LIC-STD-01; evaluation SKU FXNCEIP-LIC-EVAL-01
 - Built EtherNet/IP stack.
 - Stack can be updated/installed as an embedded application via debian package
 - The following deliverables to be available in FX9600 support site:
 - EDS files available; Studio 5000 Logix sample project with documentation available; AOP (add-on profile) for Studio 5000 Logix available; Debian package as updated are needed to the built in EtherNet/IP stack
- Improved out-of-the-box performance for FX9600 readers.
- Improved sensitivity for all link profiles in FX9600 specially in FCC frequencies.

- Support for hot swapping readers by conveniently exporting/importing reader configuration using a USB thumb drive (FAT32 format is supported).
- Added cellular support by integrating with Sierra Wireless RV50x modem to connect to 3G and LTE networks.
- Tag meta data includes GPS data when RV50x is equipped with GNSS compatible antenna
- Support for additional time-based and displacement-based triggers for delivery/trucking use cases to enable start/stop of RFID operations inside the delivery vehicle. The new triggers can be paired with existing GPI based start/stop triggers as well.
- Support for GS1 Gen2 V2 commands: Authenticate, ReadBuffer, Untraceable, Crypto. Tested with NXP Tag with TID E2C068922 which uses ISO/IEC 29167-10 (AES-128) crypto suite (Contact NXP to get document “286910 How to use UCODE AES”)
- Support for Python applications (host or embedded) to perform reader configuration and inventory using Python to C translation layer (CFFI Python model)
- REST interface to configure the reader and perform RFID operations via reader URL `http(s)://<reader host name or IP address>/restrci` with operation payload defined in RAIN RCI guidelines.
- Licensing APIs support in RFID3 (C, .NET & Java)
- Embedded C SDK updated to use a new general availability version of the tool chain
- Enabled DMA based serial driver to communicate with the Radio
- Updated SOTI client to be available in support site

Issues Addressed

- Spectre variant fixes in kernel and tool chain (SPR 34105)
 - CVE-2017-5753; CVE-2018-3693; CVE-2017-5715
- Fixes for PA issue in FX9600 when using the unconnected antennas at higher power.
- Improved HTTP session id randomness for added security
- Passwords stored with 512 bit hash key for added security
- Fixed issue which created high CPU utilization when RV50x modem is not connected and GPS data is enabled
- Fixed issue that limited the distance trigger to be used only once. With this fix multiple distance start triggers paired with stop triggers can take place
- Addressed issue that prevented SOTI client to register

- Fixed issue wherein only 1 word is reported in EPC Data when GPS is enabled, and tag report is set to report each tag as it is being read (N=1)

ADDITIONAL NOTES

Summary of major issues and limitations are listed below.

- Due to increase of firmware footprint when upgrading/downgrading from/to old versions sometimes firmware update needs to be a 2-step process:

Firmware update support table				
	Upgrade	File-Based Update	FTP-Based Update	USB-Based Update
FX7500	2.6.7 or earlier to 3.6.28	2-step upgrade	Supported	Supported
	2.7.19 to 3.6.28	Supported	Supported	Supported
	Downgrade			
	3.6.28 to 2.7.19 or earlier	2-step downgrade	2-step downgrade	2-step downgrade
	3.6.28 to 3.0.35	Supported	Supported	Supported
FX9600	Upgrade	File-Based Update	FTP-Based Update	USB-Based Update
	2.6.7 or earlier to 3.6.28	2-step upgrade	Supported	Supported
	2.7.19 to 3.6.28	Supported	Supported	Supported
	Downgrade			
	3.6.28 to 2.7.19 or earlier	2-step downgrade	2-step downgrade	2-step downgrade
	3.6.28 to 3.0.35	Supported	Supported	Supported

Supported: upgrade/downgrade is supported as usual

2-step upgrade: Use file-based method to upgrade to 2.7.19 first and then upgrade to 3.6.28

2-step downgrade: Use file-based method to downgrade to 3.0.35 and then to downgrade to 2.7.19 or earlier

- 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. If app cannot be recompiled, then user can easily revert back to version 2.7.19 using the revert back feature in the web UI.
- 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.
- If software update fails when downgrading to 2.7.x or earlier, it is likely due to the lack of free RAM. The reader status web page should show more than 120 MB of free RAM before attempting a download to an old version. It is recommended to reset the reader to free up enough RAM before downgrading to an old version.
- File based update via reader web interface does not support platform type validation as such it is not recommended.
- 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.
- Returning FX Connect license requires a reader reset. If an evaluation license expires, the reader needs to be reset to stop any current inventory operation.
- 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.
- RFSurvey is not supported in FXSeries Readers even though the LLRP capability reports true for canDoRFSurvey.