FX Series Version 3.8.22 Release Notes

This document summarizes the following firmware releases:

Firmware Release Number	Release Date	See page
V3.8.22	18-February-2021	Page 1

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

FX Series Release V3.8.22

Release Date: 18 February 2021

Zebra's Fixed reader series comprises of the following readers

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

Due to the introduction of a new firmware update process, downgrading to previous releases (V3.7.x) ARE NOT SUPPORTED once the reader is updated to V3.8.x.

Please review IMPORTANT NOTES ABOUT FIRMWARE UPDATE on pages 5-6.

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 3.8.22, 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 3.8.22 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 LLRP Server	3.8.22 3.8.22	platform_3.8.22.0.jffs2	02/18/2021
X-Loader	4.0.0	x-load_4.0.0.0.bin.ift	08/26/2018
U-Boot	3.0.15	u-boot_3.0.15.0.bin	02/18/2021
Operating System	3.7.7	uImage_3.7.7.0	02/18/2021
Root FS	3.8.7	rootfs_3.8.7.0.jffs2	02/18/2021
OsUpdate Utility	1.0.0	osupdate.elf	02/18/2021
FxUpdate Utility	1.0.0	fxupdate.elf	02/18/2021
Response	N/A	response.txt response_ext.txt	02/18/2021
Linux Kernel	4.9.182		
Radio Firmware	2.1.40 (FX9600) 1.4.88 (FX7500)		
Radio API	2.2.26.5		
EtherNet/IP	1.0.10	zebraethernetip_1.0.10.deb	02/18/2021
Profinet	1.0.1	ZebraProfinetApp_1.0.1.zip	02/18/2021
Modbus	1.0.1	ZebraModbusApp_1.0.1.zip	02/18/2021

Read To Cloud Components Version Info:

IMAGE TYPE	VERSION	FILE NAME	DATE
R2C Debian Package	2.3.6	R2C_2.3.6.zip	02/18/2021
Cloud Agent	0.2.13.1	Cloud_agent.elf	02/18/2021
Radio Control	0.1.14	radio_control.elf	02/18/2021

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	5.5.4.19	RFIDAPI32PC.DLL	02/18/2021
RFID3 .NET DLL	1.5.1.25	Symbol.RFID3.*.dll	02/18/2021
RFID3 Java JNI DLL	1.4.0.48	RFIDAPI3_JNI_HOST.dll	Sep 2020
RFID3 Java API	1.4.0.48	Symbol.RFID.API3.jar	Sep 2020
123RFID Desktop	1.3.0.0	123RFID_Desktop_v1.3.0.0	Sep 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	V1.0.4	Zebra-RFID-FXSeries-Host-C-SDK_v1.0.4.msi	Sep 2020
Zebra RFID FXSeries Host .NET SDK for Windows 7 and 10	V1.0.4	Zebra-RFID-FXSeries-Host-DotNet-SDK_V1.0.4.msi	Sep 2020

Host SDK (continued):

DESCRIPTION	VERSION	FILE NAME	DATE
Zebra RFID FXSeries Host Java SDK for Windows 7 and 10	V1.5	Zebra-RFID-FXSeries-Host-Java-SDK_V1.5.msi	May 2020
Zebra RFID C and Java SDK for 64 bit Host Linux (CentOS & Ubuntu)	V5.5.4.19 V1.4.0.49	Linux64_SDK_C_V5_5_4_19_JAVA_v1_4_0_49.tar.gz	02/18/2021

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.

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=PLrcZVTwQp0ldXdysFQHwql9FyoBNuApfM&index=5&t=0s

Method 3 – Web Interface:

Copy images to local drive of PC, log in to the reader, select 'File bas ed 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

IMPORTANT NOTES ABOUT FIRMWARE UPDATE TO V3.8.22

- Due to introduction of a new firmware update process, downgrades to previous releases are not supported once reader is updated to V3.8.x
- Reader will not allow revert-back to older firmware (Older than V3.8.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 3.8x version.

- Reader when updated to V3.8.x using ftp based updated will not enable revert-back until the next two firmware updates. This issue is not present in file based or USB based firmware updates.
- 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 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.
- Both FX7500 and FX9600 readers can be upgraded from V2.7.19 or above using the firmware update mechanisms mentioned in Installation Instructions.
- When upgrading from older versions (prior to 2.7.19) using file-based method it is recommended to upgrade to 2.7.19 first and then upgrade to current version.

ENHANCEMENTS / CHANGES in 3.8.22 over 3.7.26

- Support for PROFINET industrial protocol for FX9600.
- Support for Modbus industrial protocol for FX9600.
- Enhancements to “Cloud Connect for RFID” as below
    - Data queuing support of tag events in case of loss of connectivity to cloud.
    - Support for multiple MQTT connections for management, control, and data planes.
    - Support for persisting mode & inventory state on reader reboot.
    - Support for LED indication when reading tags via Cloud Connect
    - Support for enrollment of custom end points using Cloud Connect.
- Support for RFID modes to support M2 640 KHz on FX9600.

Regulatory	FM0=1, M2=2, M4=4, M8=8	BLF	PIE	Min Tari	Max Tari	Step Tari
FCC	*M2*	M2	*1.5*	*6250*	*6250*	*6250*

- Following enhancements have been done when the reader is configured to use only 900 MHz channels for ETSI countries.
    - Support maximum power setting up to 32.2 dBm and an absolute max power of 33 dBm with cable loss compensation.
    - Added following RFID Modes for 900 MHz channels

RFID Mode index	M2=2, FM0=1, M4=4, M8=8	BLF	PIE	Min Tari	Max Tari	Step Tari
33	*FM0*	*320000*	*1.5*	*12500*	*18800*	*2100*
34	*FM0*	*320000*	*2*	*12500*	*18800*	*2100*

35	*M4*	*480000*	*1.5*	*10400*	*10400*	*0*
36	*M4*	*480000*	*2*	*10400*	*10400*	*0*
37	*M4*	*640000*	*1.5*	*10400*	*10400*	*0*

- Improved Mask for 12.5 micro-second TARI for ETSI (FX9600)
- Added support for Nigeria regulatory.
- Support to allow setting Antenna Stop condition with Dwell Time and 1 round of inventory.
- Support for adding inventory pre-filters in the FX Connect web page
- Support for following additional WiFi dongles

Sl No	WiFi Dongle	Chipset
1	TP-Link Nano USB Wifi Dongle 150Mbps (TL-WN722N)	RTL8188EUS
2	TP-Link TL-WN821N N300 USB Wireless	RTL8192EU
3	Belkin F7D2102 N300 Micro Wireless N USB Adapter	RTL8192CU
4	TP-Link Archer T2U 11AC USB WiFi Adapter - AC600	RTL8811AU
5	Panda Wireless PAU06 300Mbps Wireless N USB Adapter	RT5372
6	Netgear Nighthawk AC1900 Wi-Fi USB Adapter (A7000)	RTL8814AU
7	Asus (USB-AC56) Dual-band Wireless-AC1300 USB 3.0 Adapter	RTL8812AU

- Support for following Bluetooth dongles:

Sl No	Bluetooth Dongle	Chipset
1	Asus USB-BT400	BCM20702A0
2	GMYLE Bluetooth 4.0 Broadcom Chip Dongle Adapter	BCM20702A0
3	Panda Bluetooth 4.0 USB Nano Adapter	CSR8510 A10
4	Bluetooth CSR 4.0 dongle Qualcomm / Atheros	CSR8510 A10
5	Bluetooth 3.0+HS Ralink RT5370L	BCM2046B1

- Support for reading Temperature using LLRP and RFID3 C & .NET API from Smartrac Temperature Sensor Dogbone (Magnus S3 / TID Header - E282 403h) tag.

Issues Addressed Over 3.7.26

- SPR 40568 Fix for issue of GPI Debounce Time not working properly in 3.7.26.
- SPR 40931 Fix of incorrect time zone reported when setting time zone to “/Asia/Urumqi” for Beijing, Chongqing, Hong Kong, Urumqi.
- SPR-40769 Fix issue of “Pre filter not working” after setting tag storage settings with Embedded Java App.
- SPR-40888 LLRP 1.1 Get version command not returning failure when tags are being buffered.
- Fix for failure in installing apps using RFID SDK.
- Changes to address issue of missing initial curly braces when sending data over FXConnect in TCP/IP mode.
- Standard profiles have been modified to remove filter setting ensuring tags are read as per the session (S2) behavior.
- Fix for POE+ wrong indication when on POE.
- Fix for issue of saving IP Address as 0.0.0.0 when switching to static IP without setting the IP address.
- Fix for IPV4 gateway reported as 0.0.0.0 in DHCP mode on the web console.
- Fix for LLDP failing to negotiate POE+ due to failure in sending negotiation packets.
- Fix for user application not auto starting when upgrading from 3.6.28 to 3.7.26
- Fix for memory leak in xml parsing in Cloud Connect causing reader reboots in long run.
- Fix for serial push data not sending tag data when “Connect” is performed from the web console.
- Fix for BT dongles not being discoverable after 1 minute of plugging in the dongle.
- Modified the LLRP server to use M4 240 link profile for access operations when Auto MAC or M4 640 link profile is used.
- Fix for failure to connect via BT dongle when passkey is used.
- Fix for RFID radio hanging during antenna check when GPI start is enabled causing further set / get mode to return failure in portal mode.

Known Issues

- SPR-40953 Access slowness when reading user memory bank compared to 3.1.12
- Idle mode time out is not used by Cloud Connect 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. Recommend to change this to 0 first to disable the Idle mode before Enrolling to Cloud.
- Rarely “Self Signed Certificate error” is shown in the webpage when in http mode and is a false alarm. There is no loss of functionality due to this and can be ignored.
- Sometime error “Error parsing tag info packet. number of bits not on byte boundary (224 bits)” is seen, when tags are reported after disconnect and connect.
- CPU usage is higher than V3.6.28 when reading tags due to enablement of high-resolution timer.
- In cloud configuration AutoConnect option cannot be changed after enrollment. This will be moved out of enrollment in future release.
- Antenna status in web console is not update with the antenna connect status when 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.
- Sometimes the web console displays “Empty response to POST” error in the wireless configuration page. This is a benign error and does not result in any loss of functionality.

ADDITIONAL NOTES

Summary of additional major issues and limitations are listed below.

- 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 Read Tags, Advanced Antenna Configuration, FX Connect, Serial configuration, and Syslog.
- 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
- RFSurvery is not supported in FXSeries Readers even though the LLRP capability reports true for canDoRFSurvey.
- On disabling a specific GPI port (using LLRP or RFID3 App) it is not possible to enable the same port unless all the ports are disabled and enabled back. It is recommended to not disable GPI ports but just not use the GPI function if it is not needed for a use case.