

FX Series and ATR7000 Firmware v3.26.90 Release Notes

This document summarizes the following firmware release:

Firmware Release Number	Release Date	See page
V3.26.90	22-April-2024	Page 1

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

FX Series and ATR7000 Release V3.26.90

Release Date: 22-April-2024



The Version 3.26.90 contains security upgrades that include upgraded SSL version. This could impact the ability to communicate with the reader from those applications that are still using older SSL versions.

Upgrading to this version will also require that any applications built or using the SDKs listed below must be rebuilt using the SDK versions that are listed later in the document.

- 1. Applications using Zebra Embedded C SDK**
- 2. Applications using Zebra C and Java SDK for Linux Host.**
- 3. Applications using Zebra Java SDK for Windows Host**
- 4. Applications using Zebra C SDK for Windows Host**
- 5. Applications using Zebra C# SDK for Windows Host.**



In order to update to 3.26.90 from versions older than V3.21.21 the readers must be updated to 3.21.21 first. Once updated to 3.26.89 the reader cannot be downgraded to 3.21.21. However, “revert back” functionality from 3.26.90 to 3.21.21 is supported and can be used.



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.

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

The current build, 3.26.90, is applicable to all ATR7000 SKUs, FX7500 and FX9600 readers.

Contents of the release package:

IMAGE TYPE	VERSION	FILE NAME	DATE
RM Server	3.26.90	platform_3.26.90.jffs2	4/22/2024
LLRP Server	3.26.90		
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	3.20.2	ulmage_3.20.2.0	3/14/2023
Root FS	3.21.11	rootfs_3.21.11.0.jffs2	2/27/2024
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	2.1.53 (FX9600 & FX7500 ASIC) 1.4.90 (FX7500) 2.2.29.0 (ATR7000 900MHz) 2.28.30.0 (ATR7000 800 MHz)		
FPGA	1.8.0.0 (ATR Spartan 6) 2.0.0.0 (ATR Spartan 7)		
Radio API	2.2.37.0		10/05/2023

EtherNet/IP	1.0.12	zebraethernetip_1.0.12.deb	3/16/2024
Profinet	1.0.4	ZebraProfinetApp_1.0.4.zip	3/16/2024
Modbus	1.0.4	ZebraModbusApp_1.0.4.zip	3/16/2024

IOT Connector Components Version Info:

IMAGE TYPE	VERSION	FILE NAME	DATE
IOT Connector Debian Package	2.10.28	ZIOTC_2.10.28.zip	4/15/2024
Cloud Agent	0.6.2.28	Cloud_agent.elf	4/15/2024
Radio Control	0.2.58.6	radio_control.elf	2/27/2023
Python DA module	0.0.5	pyziotc.so	10/5/2023
Node DA module	0.0.5	Ziotc.node	10/5/2023
Directionality (ATR7000)	0.3.36	Directionality_0.3.36.zip	4/15/2024

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	5.5.7.12	RFIDAPI32PC.DLL	April 2024
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	3.0.0.9	123RFID_Desktop_v3.0.0.9	Jan 2024

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	V1.0.6	Zebra-RFID-FXSeries-Host-C-SDK_v1.0.6.msi	April 2024
Zebra RFID FXSeries Host .NET SDK for Windows 7 and 10	V1.0.7	Zebra-RFID-FXSeries-Host-DotNet-SDK_V1.0.7.msi	April 2024
Zebra RFID FXSeries Host Java SDK for Windows 7 and 10	V1.8	Zebra-RFID-FXSeries-Host-Java-SDK_V1.8.msi	April 2024
Zebra RFID C and Java SDK for 64 bit Host Linux (CentOS & Ubuntu)	V5.5.7.12 V1.4.0.51	Linux64_SDK_C_V5_5_7_12_JAVA_v1_4_0_51.tar.gz	4/15/2024

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	May 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	May 2020
Zebra C / CPP SDK for Linux	Zebra-FXSeries-Embedded-C-CPP-SDK-UserGuide_Linux.docx	Zebra-FXSeries-Embedded-SDK-C-CPP_Linux_V1.0.3.tar.gz ZebraFXSeriesEmbeddedSDKCCPPLinux_1.0.3.deb	April 2024

Installation Instructions

There are multiple supported ways to upgrade the FX Series & ATR7000 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. Please note this method cannot be used with ATR7000

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=PLrcZVTwQp0ldXdysFQHwqI9FyoBNuApfM&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 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

All SKU's of FX Series and ATR7000 readers are supported with this firmware.

ATR7000

FX9600

FX7500

IMPORTANT NOTES ABOUT FIRMWARE UPDATE TO V3.26.90

- **This firmware is fully backward compatible with Apps using Zebra SDKs. Apps will need to be rebuilt using the latest SDKs. Please see Page 1.**
- **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 not supported 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.**
- 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 older firmware versions, 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.

ENHANCEMENTS / CHANGES in 3.26.90 over 3.25.70

Security Enhancements

- Upgraded openssl (3.0.12) (SPR-50867, SPR-51880, SPR-52055, SPR-52080, SPR-52239, SPR-52710)
- Fix for disabling NTP Mode 6 Scanner.
- Openssl 3 upgrade for Embedded C SDK, Linux Host C and Java SDK, Windows C, Java and .NET SDKs
- Openssl3 upgrade for Ethernet-IP, Profinet and Modbus applications.
- Single port operation for web console. Node Server Port is not configurable and all Web console operations are handled via port 443 for HTTPS and 80 for HTTP.

Issue Fixes

- SPR-52710: Fix in IOTC for not honoring the batching parameters for the first batch in HTTP/HTTPS POST data endpoint.
- Fix for RM for RC watchdog. In cases where IOTC is running but RC stops, RC will now be automatically restarted.
- Fix in RM to not starting userapp again if already running when a startUserApp RM command is issued.
- Radio firmware version 1.4.90: Radio operation for inventory has been optimized/modified to overcome an issue with older batch of NXP UCode 9 tags few of which will start in an incorrect state (State A Vs State B) in Sessions S2 and S3 which prevented them from being read during inventory.
- EPC on TagMetaData reported wrong value randomly on tagEvents when multiple tags are in FOV.
- Fix for failure to return antenna stop condition in set_config when set to default.
- getty error logs repeated multiple times causing log overrun.

Known Issues in 3.26.90

- The Operating Mode page for IoT Connector lists 480 antennas while the set_mode Zebra IoT Connector command only accepts 14 antennas. The current antenna behavior will be deprecated in future in favor of a cleaner antenna configuration for ATR7000.
- After mapping the Keyboard Emulation to a data endpoint in Zebra IoT Connector, 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 Zebra IoT Connector Interface and should be set to 0 ensuring that the radio stays powered on before connecting to cloud. It is recommended to change this to 0 first to disable the Idle mode before enabling Zebra IoT Connector Interface.
- 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.
- 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.

LLRP

- 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 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.
- 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.
- Performing changes in the reader and committing the same while LLRP is upgrading the Radio firmware can cause LLRP to shutdown and not start back. To confirm readers are operational after an update, please check the version page to confirm 'Radio firmware version' shows up with values matching image version number table above
- Moderated Timeout for Portal Directionality Events (Zone Entry, Exit or Transition Events) needs to be atleast 5 seconds or above for the moderation to take effect.

User Apps

- User applications installed on older release (2.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.

Web console

- When updating the reader 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, Syslog.
- If the admin user password is changed it will be necessary to install the latest versions of EtherNet/IP, Profinet and Modbus packages on FX9600.
- Large file names are not supported when importing reader configuration in Reader Profiles web page
- When reader web console is set to secure HTTP mode, 'Read Tags' reader operation demonstration page in web console won't be loaded in some of the browsers (latest Firefox and Internet Explorer) unless trusted certificates are used on the reader or default self-signed certificate is trusted by the browser.

Miscellaneous

- **Cable loss compensation is being used to aid in the detection of Antenna presence on FX9600. As part of deployment, it is required to set the Cable length and loss appropriately as per the cable used for a given antenna connection.**
- **FX7500 readers (with ASIC based radio) cannot be downgraded to versions older than V3.25.70 as these were not supported with firmware older than V3.25.70.**
- Since the Reader will only accept zebra signed firmware, downgrades to previous releases are not supported.

- Serial Port configuration (including BaudRate, StopBits, DataBits, Flowcontrol and Parity) on FX9600 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 on FX9600, banner message “reboot required” is not consistent. It is recommended to follow above note whenever serial port configuration is changed.
- Regular inventory operations fail after RFSurvey is performed. Reader needs to be restarted to restore regular operation.
- RFSurvey is not supported in FXSeries Readers even though the LLRP capability reports true for canDoRFSurvey.

LLDP/POE/POE+

- Some of the switches do not respond back to the reader power negotiation request if there is no change in the requested power from the reader. Thus, the reader will consider negotiation is successful only at startup. If the LLDP negotiation setting is changed (Off to on) at run time reader will show power negotiation as failed. In these cases, it is recommended to restart the reader on changing the Power Negotiation Configuration.
- If POE power negotiation is turned off in web console, LLDP power negotiation will not be performed. It may be noted that older version of ATR software prior to 2.15.14 had power negotiation turned off. If ATRs are updated to 2.15.14 from any of the older versions, as reader configurations are migrated and reused, power negotiation will not be enabled by default. User need to either reset readers to factory default settings or explicitly turn on Power Negotiation from ‘Configure Reader’ link in Web Console.
- Power negotiation requires ATRs to be connected to PoE+ compliant switch and switch to be configured with power negotiation via LLDP enabled. If switch ports are configured to supply PoE+ power levels and power negotiation is disabled in the switch, ATRs need to be configured to turn off power negotiation. Else ATR will attempt power negotiation and as switch will not respond to negotiation attempt, ATR will assume failure to negotiate power and reader operator will not be allowed to run radio operations.
- Maximum power configured for each port on the switch should account for power losses on the connectors, CATx cable used and its length. Typically, 4.5 W/port of loss is normal. As such, configuration for maximum power per port typically needs to be around 30 W such that request from the ATR for 25.4W of power can succeed.
- Power negotiation is not possible with PoE Injectors. If ATR is powered over PoE injectors, user need to ensure PoE injector is rated to supply 25.4 W at a minimum.

ATR7000 Differences with FXSERIES Readers

ATR7000 RM / Web console differences compared to FX Series Readers

ATR7000 web console does not support the following web pages (when compared to FX7500)

- Wireless and Bluetooth config is not supported

Number of Antenna’s (beams) exposed in ATR7000

ATR7000 exposes 480 antenna’s as part of the capability. However, with the current ATR7000 firmware only the following beams are supported.

- Beams 101-197

- Beams 201-297
- Beams 301-397

Beams other than the above do not result in Tag reads. These are left unused for future use and will provide appropriate error in a subsequent release.