



GENERAL SERVICE BULLETIN

SYNC Programming For SYNC 4, Lincoln Digital Experience, Ford Digital Experience

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This bulletin supersedes 23-7035. Reason for update: update the vehicle model years affected and the Service Information

Markets: North American markets only

Summary

The APIM may require programming to add system enhancements/upgrades, improve system reliability and/or address consumer issues. The following information is intended to help determine when programming is necessary and address common programming issues using the FDRS.

Service Information

Equipment, Tooling and Dealer Infrastructure

The FDRS scan tool utilizes a cloud-based architecture. The benefits of such an architecture include the ability for Ford to make real time improvements without the need for dealers to complete a lengthy diagnostic tool update. A cloud-based architecture reduces scan tool installation time by reducing installation package size. A result of this architecture may be that dealers experience extended software download time during module programming events if their dealer infrastructure does not meet Ford recommendations. Poor internet connection or upload/download (megabytes per second [Mbps]) times may contribute to extended software download times during module programming. These minimum dealer infrastructure requirements depend on several factors, including the number of devices connected to the dealers' network.

Internet Service Minimum Bandwidth Specifications

Table 1

Number Of Connected Devices	Network Download (Mbps) Speed Requirements	Network Upload (Mbps) Requirements
Less than 20 devices	Greater than 100 Mbps	Greater than 10 Mbps
20-100 devices	Greater than 300 Mbps	Greater than 30 Mbps
Greater than 100 devices	Greater than 500 Mbps	Greater than 50 Mbps

Minimum Recommendations – Diagnostic Equipment (Example – FDRS)

Table 2

Item	Minimum Recommendation
Processor	Intel i5 10th Gen or AMD equivalent
System Memory (RAM)	16 Gigabyte (GB)
Hard Disk Drive	Solid State 500 GB
USB Ports	2 (Universal Serial Bus (USB) 3.1, 3.2)

Item	Minimum Recommendation
Display	15 inch monitor minimum (1600x900 minimum resolution)
Network Adapter	Wired: Recommend Ethernet-based if available (1 Gigabit); Wireless: 802.11ac, 802.11ax preferred
Operating System	Microsoft Windows 11 / latest 10 Windows

APIM Programming

Due to decommission of Internet Explorer (IE), all generations of SYNC use FDRS for APIM programming. PTS SYNC programming is no longer supported.

When Is APIM Programming Necessary?

If the APIM is replaced, a PMI is required. Each replacement module comes with the latest software and upgrades/improvements are provided with each software release. Review applicable SSM, TSB, FSA, or GSB for additional details.

SYNC 4 And Digital Experience Software Dependencies

The first initial stage of APIM software updates may require updating the GWM, TCU, and IPC first. In order to receive the latest APIM software update in FDRS, make sure GWM, TCU, and IPC have the latest software version.

APIM Programming Tips Using FDRS Programming

Refer to WSM, Section 418-01 - General Procedures - Module Programming.

12-Volt Battery Testing, Charging, Maintenance and State Of Charge For Module Programming - Battery Health And Voltage Maintenance

- It is recommended to test the 12-volt battery(ies) using Rotunda GRX-3590 or DCA-8000 tools prior to a programming event. The battery(ies) should be fully charged or replaced prior to programming based on the test results from the approved Rotunda tools.
- Once battery health is determined using approved Rotunda tools, the battery should be maintained in the 12.9 volt - 13.6 volt range for APIM programming. It may be necessary to verify that the voltage is within the desired range using displays on the charger, the battery monitor status at the bottom right corner of the FDRS scan tool or using a digital volt ohm meter (DVOM) connected to the battery.
- If equipped, the tool being utilized to maintain the battery should be adjusted to the maximum time limit possible, to prevent charger/maintainer time outs during long flash events. Battery charging should be performed per WSM, Section 414-01 > General Procedures. Always refer to the specific WSM, Section 414-01 for the vehicle in question.

NOTE: Connecting the battery charger negative clamp directly to the battery negative terminal might result in the SOC PID not immediately reflect the improvement from charging. It is not necessary to perform a BMS reset unless the battery is replaced or the battery is disconnected when charged. If the battery is charged with the battery charger negative clamp directly on the battery negative post while the battery is fully connected to the vehicle, it may take hours for the BMS PID to update.

Battery State of Charge Percentage (BATT_SOC%)

The BCM calculates the battery SOC using inputs from the BMS, known battery capacity, battery voltage, battery time in service and battery temperature. The battery SOC can be used to verify that the battery will support vehicle current consumption demands during module programming. If the battery is in poor condition and the BCM PID for BATT_SOC reports that SOC is low, offboard battery chargers may not be able to maintain the voltage or current demands required of both the battery and the vehicle, leading to programming faults. The FDRS programming applications will call attention to the SOC% requirement. It is generally recommended that the battery SOC be at 50% or greater to be sure of successful programming.

Performing APIM programming with poor SOC is unacceptable. This applies to PMI, Module Replacement Programming, Standard Programming, and software updating. Poor SOC will induce module failures leading to excessive down time and potential module replacement that can be avoided. Make sure

the battery charger is set to maintain 12.9v-13.5v. Confirm the BCM 12v battery SOC percent is greater than 50%. Charging at 15v and higher is excessive and isn't a suitable environment. The APIM can go into a self-protection strategy preventing FDRS from programming the module.

NOTE: When charging the 12v, connect positive battery connection to positive battery post and negative battery connection to chassis ground. This ensures the vehicle BMS sensor detects current flow and the SOC will continue increasing as result. Confirm the BCM 12v battery SOC percent is greater than 50% and perform the BMS reset as needed. Make sure the battery charger is set to maintain 12.9v-13.5v and continue with APIM programming.

FDRS example error message during APIM programming with poor SOC present:

"Poor battery condition! Battery Voltage = 11.585v Minimum required = 10.0v Battery Estimated State of Charge = 29% Minimum required = 50% This will most likely cause issues with the USB software update process. Please connect an appropriate battery charger and/or run the BCM-Reset Battery Monitoring System Learned Values application. What would you like to do?"

A hard-wired internet connection is strongly recommended. If a hard-wired internet connection is not available, higher speed Wi-Fi connections are strongly recommended. Using a slower Wi-Fi source will result in programming errors. Recommend using Mobile Hotspot as needed when internet provider connections issues are suspected.

Examples Of Not Having An APIM Programmed Properly

- Future map updates will cause errors and will not complete.
- Missing features such as climate, various settings for vehicle, and SiriusXM.
- Inaccurate navigation or compass.
- Connected Services may not work properly such as incomplete software updates via OTA, connected navigation inoperable, and enhanced voice recognition failures.
- FordPass or LincolnWay features may not operate properly.
- Loss of navigation, navigation voice prompts, or SYNC voice prompts.
- Erratic Apple CarPlay and/or Android Auto operation.
- General inability for SYNC to communicate to the Ford back-end cloud.

Recommended USB Drive Size

For SYNC 4 vehicles, a 32GB or larger with USB 3.1, USB 3.2 or higher drive is required for APIM software update. The USB drive must be formatted to exFAT. Using a smaller drive such as a 32GB flash drive or incorrectly formatted drive will induce SYNC programming issues potentially resulting in APIM failure.

For Digital Experience vehicles, a 64GB minimum with USB 3.2+ flash drive is required for APIM software update. The USB drive must be formatted to exFAT. Using a smaller drive such as a 32GB flash drive or incorrectly formatted drive will induce SYNC programming issues potentially resulting in APIM failure. Reference and follow applicable TSB, FSA, or GSB direction.

NOTE: USB 3.2 Gen 2 and using high speed USB port on the laptop is recommended for faster file transfer speed.

USB Flash Drive Formatting

Make sure the USB flash drive being used is formatted correctly. To see the available drives, hold down the Windows icon keyboard key and press the E keyboard key. Right click on the USB flash drive and select Properties. If File System under the General tab is not exFAT, the drive must be formatted.

To format the USB flash drive:

- Right click on the USB flash drive

- Select Format, select exFAT for the File System
- Select Default Allocation Size for the Allocation Unit Size

De-selecting Quick Format is not necessary and will result in a lengthier operation.

NOTE: Do not select or use new technology file system (NTFS). The NTFS formatting option is not supported to program any generation of SYNC.

NOTE: Full format can take up to 15 minutes to complete.

NOTE: If all normal WSM, TSB, SSM and/or GSB diagnostics have been performed, there may be a SYNC server issue preventing SYNC programming. If all above diagnostics, as well as all below diagnostics, have been performed, it may be necessary to contact the Ford TAC to restore the SYNC server information as instructed in the dealer escalation process.

SYNC/APIM Reboot-Reset Procedure (Digital Experience vehicles)

Hold volume down on FCDIM/center display screen for 10 seconds. Directions can be located in applicable FSA and located in WSM, Section 415-00 > General Procedures.

SYNC/APIM Reboot-Reset Procedure (SYNC 4)

Vehicles equipped with a volume/power and right seek button, press and hold both the volume/power and right seek button for 10 seconds and the system will reboot. For vehicles not equipped with a volume/power button, holding the seek right and volume down buttons on the steering wheel controls will reboot the SYNC 4 system. Directions is located in WSM, Section 415-00 > General Procedures.

FDRS APIM - Reset SYNC Module Option

Start vehicle session using the FDRS scan tool > Go to the Toolbox Tab > Select APIM > APIM – Reset the SYNC Module.

NOTE: An APIM/SYNC reset/reboot consists of an APIM software cold boot. It may not be necessary to perform a master reset after performing a cold boot if the concern is resolved. The SYNC reset/reboot procedure does not remove or delete any stored user information that occurs when performing an APIM master reset.

RVC Requirements

Refer to the Components Requiring A Repair Validation Code form located on PTS homepage - Technical Assistance dropdown.

NOTE: The Guided Routine process has been updated. Please make sure to complete entire WSM pinpoint test or Guided Routine in order to generate an RVC.

Connected SYNC, Connected Navigation Concerns or Issues After APIM Replacement - SYNC 4 And Digital Experience

Error State/Message	Possible Causes	Solution
<ul style="list-style-type: none"> • Defaults to AM radio (Digital Experience only) 	<ul style="list-style-type: none"> • User profile was not set up 	<ul style="list-style-type: none"> • Set up user profile, fully connect FordPass or LincolnWay, and retest • <u>APIM</u> replacement is not recommended
<ul style="list-style-type: none"> • Various SYNC, Bluetooth, center display screen, Apple CarPlay, and 	<ul style="list-style-type: none"> • Outdated module software 	<ul style="list-style-type: none"> • Update SYNC software to latest per this article

Error State/Message	Possible Causes	Solution
<p>Android Auto related concerns. (SYNC 4 and Digital Experience)</p>	<ul style="list-style-type: none"> • Outdated Apple device software • Outdated Android device software • Device concerns 	<ul style="list-style-type: none"> • Make sure latest Apple and Android device software versions are downloaded • Make sure latest Apple CarPlay and Android Auto software is downloaded • <u>APIM</u> replacement is not recommended
<ul style="list-style-type: none"> • Floating map display or missing navigation features. • Missing point of interests (POI). 	<ul style="list-style-type: none"> • Outdated module software • Connected vehicles not enabled • Connected navigation function not enabled 	<ul style="list-style-type: none"> • Update SYNC software to latest per this article • Fully connect FordPass or LincolnWay, enable connected services, set up user profile as needed, retest • Enable connected navigation and all connected vehicle services retest • Follow dealer escalation process • Multiple <u>APIM</u> replacement is not recommended
<ul style="list-style-type: none"> • Map unavailable after <u>APIM</u> replacement. (SYNC 4 only) 	<ul style="list-style-type: none"> • Duplicate navigation applications. Garmin or TeleNav should be displayed on <u>PTS SYNC</u> page under Diagnostic tab. • SYNC 4 vehicles do not require both navigation applications 	<ul style="list-style-type: none"> • Follow dealer escalation process • Multiple <u>APIM</u> replacement is not recommended
<ul style="list-style-type: none"> • Incorrect connected services subscription or subscription renewal issues. • Vehicle populates incorrect subscription information. 	<ul style="list-style-type: none"> • Lapse in subscription coverage • Connected services not enabled 	<ul style="list-style-type: none"> • Confirm customer has active connected services subscription • Confirm customer has connected vehicle services enabled per this article • Follow dealer escalation process • <u>APIM</u> replacement is not recommended

APIM Programming Concerns or Issues After APIM Replacement - Digital Experience Equipped Vehicles

Error State/Message	Possible Causes	Solution
<ul style="list-style-type: none"> • Various programming concerns during <u>PMI</u> 	<ul style="list-style-type: none"> • <u>USB</u> update was unsuccessful • Poor <u>SOC</u> present during programming attempt • Concern with <u>FDRS</u> • Corrupt files downloaded onto flash drive 	<ul style="list-style-type: none"> • Confirm latest <u>FDRS</u> software version is downloaded and used • Confirm proper internet provider speed is present per this article • Ensure proper <u>SOC</u> is present per this article • Ensure flash used was properly formatted per this article and retry <u>APIM</u> programming • Follow dealer escalation process
<ul style="list-style-type: none"> • Various procedure unsuccessful messages during software update 	<ul style="list-style-type: none"> • Poor <u>SOC</u> present during programming attempt • Concern with <u>FDRS</u> • Corrupt files downloaded onto flash drive 	<ul style="list-style-type: none"> • Confirm latest <u>FDRS</u> software version is downloaded and used • Confirm proper internet provider speed is present per this article • Make sure proper <u>SOC</u> is present per this article • Make sure flash used was properly formatted per this article and retry <u>APIM</u> programming • Follow dealer escalation process
<ul style="list-style-type: none"> • "Procedure Unsuccessful - UpdateSoftwareOverUSB Unable to program module, process aborted" 	<ul style="list-style-type: none"> • <u>USB</u> update was unsuccessful • Poor <u>SOC</u> present during programming attempt • Concern with <u>FDRS</u> • Corrupt files downloaded onto flash drive 	<ul style="list-style-type: none"> • Confirm latest <u>FDRS</u> software version is downloaded and used • Confirm proper internet provider speed is present per this article • Make sure proper <u>SOC</u> is present per this article • Make sure flash used was properly formatted per this article and retry <u>APIM</u> programming

Error State/Message	Possible Causes	Solution
<ul style="list-style-type: none"> No center display screen feedback after inserting flash drive into <u>USB</u> port or "Indexing" populates on the center display screen 	<ul style="list-style-type: none"> <u>APIM</u> did not detect or cannot read files from flash drive used <u>USB</u> port concerns <u>GWM</u> software concerns 	<ul style="list-style-type: none"> Confirm <u>USB</u> port is fully operational and make sure <u>GWM</u> has latest available software Perform 2-button reset while drive remains plugged in Turn ignition off and disconnect the 12v battery, remove flash drive. Reconnect 12v battery, turn ignition on, re-insert flash drive after SYNC fully boots up Follow dealer escalation process Multiple <u>APIM</u> replacement is not recommended
<ul style="list-style-type: none"> Various concerns after module replacement or after recent <u>OTA</u> update 	<ul style="list-style-type: none"> Concern with <u>APIM</u> software or configuration data Partial <u>OTA</u> update downloaded 	<ul style="list-style-type: none"> Follow dealer escalation process Multiple <u>APIM</u> replacement is not recommended

APIM Programming Concerns Or Issues After APIM Replacement - SYNC 4 Equipped Vehicles

Error State/Message	Possible Causes	Solution
<ul style="list-style-type: none"> Various programming concerns 	<ul style="list-style-type: none"> <u>DTCs</u> in <u>GWM</u> Low or poor battery <u>SOC</u> 	<ul style="list-style-type: none"> Scan and check for ethernet related <u>DTCs</u>. Continue diagnostics and retry <u>APIM</u> programming Address <u>SOC</u> per this article
<ul style="list-style-type: none"> No center display screen feedback after inserting flash drive into <u>USB</u> port or "Indexing" populates on the center display screen display 	<ul style="list-style-type: none"> <u>APIM</u> did not detect or cannot read files from flash drive used <u>USB</u> port concerns 	<ul style="list-style-type: none"> Confirm <u>USB</u> port is fully operational Perform 2-button reset while drive remains plugged in Turn ignition off and disconnect the 12v battery, remove flash drive. Reconnect 12v battery, turn ignition on, re-

Error State/Message	Possible Causes	Solution
		<p>insert flash drive after SYNC fully boots up.</p> <ul style="list-style-type: none"> • Follow dealer escalation process • Multiple <u>APIM</u> replacement is not recommended
<ul style="list-style-type: none"> • "Procedure Unsuccessful - UpdateSoftwareOverUSB Unable to program module, process aborted" 	<ul style="list-style-type: none"> • <u>USB</u> update was unsuccessful • Poor <u>SOC</u> present during programming attempt • Concern with <u>FDRS</u> • Corrupt Files downloaded onto flash drive 	<ul style="list-style-type: none"> • Confirm latest <u>FDRS</u> software version is downloaded and used • Confirm proper internet provider speed is present per this article • Ensure proper <u>SOC</u> is present per this article • Ensure flash used was properly formatted per this article and retry <u>APIM</u> programming
<ul style="list-style-type: none"> • "Procedure Unsuccessful - GetFlashActionPartNumbers" • "Procedure Unsuccessful – ValidateFlashActionDIDsAgainstModule/" 	<ul style="list-style-type: none"> • Concern with module • Poor <u>SOC</u> present during programming attempt • Concern with <u>FDRS</u> 	<ul style="list-style-type: none"> • Contact the Customer Online Parts Inquiry System (COPIS) to ensure correct module was installed for vehicle • Confirm latest software version is <u>FDRS</u>downloaded and used • Make sure proper <u>SOC</u> is present per this article • Make sure flash used was properly formatted per this article and retry <u>APIM</u> programming
<ul style="list-style-type: none"> • "Unable to Obtain Software Binary File" • "Procedure Unsuccessful – GetConfigDataFromGIVIS Modified Configuration data is missing from Ford 	<ul style="list-style-type: none"> • <u>FDRS</u> was unable to obtain module configuration data or software files from the Ford servers. Internet connectivity, upload/download speeds or 	<ul style="list-style-type: none"> • Re-attempt <u>APIM</u> programming with a different laptop, uninstall / reinstall <u>FDRS</u>, or delete the <u>VIN</u> from

Error State/Message	Possible Causes	Solution
<p>server/GetVehicleNodeInfo Direct configuration data is missing."</p> <ul style="list-style-type: none"> • "Manifest Not Found In FENIX Responses" 	<p>missing data from the Ford servers may contribute to these errors.</p>	<p>the previous sessions list and retry</p> <ul style="list-style-type: none"> • Verify that the computer being used has a strong internet connection, fast internet connection and all anti-virus and firewall type programs are disabled. Refer to the Equipment, Tooling And Dealer Infrastructure section in this article. • Retry on a different network, a hardwired vs. wireless internet connection, and/or with a mobile hotspot. Refer to the Equipment, Tooling And Dealer Infrastructure section in this article.
<ul style="list-style-type: none"> • Various concerns after module replacement or after recent <u>OTA</u> update 	<ul style="list-style-type: none"> • Concern with <u>APIM</u> software or configuration data • Partial <u>OTA</u> update downloaded 	<ul style="list-style-type: none"> • Follow dealer escalation process • Multiple <u>APIM</u> replacement is not recommended

FDRS Related Errors

Error State/Message	Possible Causes	Solution
<ul style="list-style-type: none"> • "Unable To Communicate With The Module" • "Could Not Communicate With The VCM" • "Procedure Unsuccessful - EstablishComms Could Not Communicate With The VCM" • "Make Sure That All Cables Are Connected" 	<ul style="list-style-type: none"> • <u>FDRS</u> was unable to communicate with the module. This may be due to a fault on the vehicles network or with communication to a specific module. • It may also be possible that a diagnostic file used by the <u>FDRS</u> scan tool or information within the <u>FDRS</u> servers is incorrect. 	<ul style="list-style-type: none"> • Delete the <u>VIN</u> from the previous sessions list, ensure latest <u>FDRS</u> software version is downloaded, and retry. • Re-attempt the programming application with a different laptop • Uninstall/reinstall <u>FDRS</u>, retry programming • Determine if the module can complete an on-demand <u>DTC</u> self-test and pass a network test. If the module(s) fail either

Error State/Message	Possible Causes	Solution
• "Unable To Communicate With The Vehicle. Check All Cable Connections And Make Sure The Ignition Is Switched On."		test, suspect a module or network communication fault.

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NOTE: This information is not intended to replace or supersede any warranty, parts and service policy, workshop manual (WSM) procedures or technical training or wiring diagram information.