

Software Release Notes

14221-1100-8170

Rev. AT, June 2023

Radio Personality Manager 2 (RPM2)

14004-0206-01 R16C



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MANUAL REVISION HISTORY

REV	DATE	REASON FOR REVISION
W	Jun/19	Updated for R8B release; new feature and TR resolution.
Y	Oct/19	Updated for R9A release; new features/enhancements and TR resolution.
AA	Nov/19	Updated for R9B release; TR resolution.
AB	May/20	Updated for R10A release; new features/enhancements and TR resolution.
AC	Nov/20	Updated for R11A release; new features/enhancements, TR resolution, and L3Harris rebranding.
AD	Jan/21	Updated for R11B release; new features/enhancements and TR resolution.
AE	Feb/21	Updated for R11C release; TR resolution.
AF	Apr/21	Updated for R12A release; new features/enhancements and TR resolution.
AG	May/21	Updated for R12B release – added P25T Infinite Queue Time.
AH	Jun/21	Updated for R12C release; new features/enhancements and TR resolution.
AJ	Sep/21	Updated for R12D release; new features/enhancements and TR resolution.
AK	Nov/21	Updated for R13A release; new features/enhancements and TR resolution.
AL	Feb/22	Updated for R13B release; new features/enhancements and TR resolution.
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AN	Aug/22	Updated for R14B release; new features/enhancements and TR resolution.
AP	Sep/22	Updated for R14C release; new features/enhancements and TR resolution.
AR	Oct/22	Updated for R14D release; TR resolution.
AT	Jun/23	Updated for R16C release; new features/enhancements and TR resolution.

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1. CONVENTIONS

The following conventions may be used in this manual to alert the user to general safety precautions that must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. L3Harris assumes no liability for the customer's failure to comply with these standards.



The **CAUTION** symbol calls attention to an operating procedure, practice, or the like, which, if not performed correctly or adhered to, could result in a risk of danger, damage to the equipment, or severely degrade the equipment performance.



The **NOTE** symbol calls attention to supplemental information, which may improve system performance or clarify a process or procedure.

2. INTRODUCTION

Radio Personality Manager 2 (RPM2) is the primary user interface that provides users with the ability to fully configure the supported radios listed in Section 3.3. This document contains Software Release Notes for RPM2, part number 14004-0206-01, R-State R16C.

3. COMPATIBILITY

3.1 OPERATING SYSTEM REQUIREMENTS

RPM2 is compatible with the following US versions of Microsoft Windows, English Language only. International versions are not supported.

- Windows 7 SP1 (x86 and x64)



Because Microsoft is ending support for Windows 7, all installations of RPM2 running on Windows 7 should be migrated to an actively supported operating system, specifically Windows 10. RPM2 is minimally tested on Windows 7 and should only be used with Windows 7 in situations where no other solution exists.

- Windows 8 and 8.1 (x86 and x64)
- Windows 10 (x86 and x64)
- Windows 11 (x64)



RPM2 is only supported on US versions of the Windows Operating System (English language only). Installation and usage of this application on unsupported versions of Windows may cause personality corruption.

3.2 HARDWARE REQUIREMENTS

- 2 GHz or faster dual-core processor.
- 4 GB of RAM.
- The PC must have at least 100 MB of free hard drive space to install the RPM2 application.
- If the PC does not already have Microsoft .NET Framework 4.6.2, an additional 850 MB (x86) or 2 GB (x64) may be required.
- Minimum resolution: 1366 x 768
Optimal resolution: 1920 x 1080

3.3 RADIOS

RPM2 supports the following radios:

Table 3-1: Supported Radios

DEVICE	MINIMUM FIRMWARE	USB	WI-FI	SERIAL
XL-400P	XLP R13A	Yes	Yes	No
XL-200P	XLP R4A	Yes	Yes	No
XL-185P	XLP R5A	Yes	Yes	No
XL-150P	XLP R12A	Yes	Yes	No
XL-95P	XLP R12A	Yes	Yes	No
XL-45P	XLP R12A	Yes	Yes	No
XG-75P (Scan and System)	XLP R4A	No	No	Yes
XG-75Pe (Scan and System)	XLP R4A	No	No	Yes
XG-25P (Scan and System)	XLP R4A	No	No	Yes
XG-15P (System)	XLP R4A	No	No	Yes
XG-75M	XLP R4A	No	No	Yes
XG-25M	XLP R4A	No	No	Yes
XG-100M/CH-100	XLP R4A	Yes	No	No
XG-100M/CH-721	XLP R4A	No	No	Yes
XL-185M	XLP R7A	Yes	No	No
XL-200M	XLP R9A	Yes	No	No



NOTE

Every time a new radio is plugged into a USB port on the computer, the device driver installation goes through the entire installation process to register that specific device to the computer. After that completes, some computers are configured to automatically connect to Windows Update to look to see if a new version of the driver exists. This can take a long time and is dependent on network speed, firewalls, etc. To speed things up, disable Windows from automatically going to Windows Update when installing a new device driver.



NOTE

RPM2 only supports one connection per radio at a time for radios that have multiple connections (e.g., Serial on back of MRU, Serial on back of Control Head, Front-mic jack, or USB on front of Control Head).

3.4 RADIO PERSONALITY MANAGER (RPM)

3.4.1 Application

RPM R14C or later can be installed and used with RPM2.



If **Security Keys** are added to a dongle for use with Personality Lock in RPM2, any operation performed in RPM R11A or R12A that modifies the dongle also deletes those Security Keys from the dongle. See Section 11.1 for more information.

3.4.2 Personalities

RPM2 supports personalities saved with RPM R11A and later. This is due to file changes made in RPM to support Advanced Access Control (AAC) Administrator. Personalities created in previous, pre-AAC, versions of RPM (R10B or older) must be opened and saved in RPM R11A or later before RPM2 can open them. If pre-AAC personalities are opened in RPM2, an error box is displayed stating that pre-AAC personalities are not compatible with RPM2.



To downgrade RPM2 from R6A to R5xx or previous versions, uninstall RPM2 R6A and AAC R3A first.

3.5 PROFILE MANAGER

Over-The-Air Programming (OTAP) is available for this version of Radio Personality Manager 2 (RPM2) through Profile Manager R11A or later. Profile Manager R11A does not support RPM and their personalities. RPM personalities must be converted into the RPM2 format by saving it as a *.PRSX file when using OTAP.

3.6 ADVANCED ACCESS CONTROL (AAC)

RPM2 installs, as a prerequisite, AAC R3A. If a Master or a Distribution Dongle was created with AAC Administrator R1A (installed with Radio Personality Manager R11A – R12A), it can be opened in AAC Administrator R3A with the same contents. To use the Dongle with RPM2, it must be licensed for RPM2. See Section 9 for more information on licensing.



NOTE

AAC Administrator R3A is compatible with RPM2 R6A and later. However, AAC Administrator R1A (installed with RPM R11A – R12A) is **not fully compatible** with RPM2 and should not be used when dongles have Security Keys for RPM2. See Section 11.1 for more information on the Security Keys.

It is strongly advised that after RPM2 is installed, any license or dongle updates required for RPM R11A – R12A should be handled in AAC Administrator R2A. AAC Administrator R2A is installed with RPM2 and is found in **All Programs → Harris Advanced Access Control**.

4. APPLICATION OVERVIEW

Refer to the *RPM2 User's Manual*, 14221-1100-2060, for an overview of the user interface and instructions on using the application.

Table 4-1: Personality Limitations

ITEM	LIMITS		
	XL-Radios	XG-100M w/CH-100	All Other RPM2-Supported Radios
Systems	512	512	512
Zones	250	250	50
System Alpha (alias)	512	512	512
System Long Alpha (alias)	512	512	N.A.
EDACS Group Sets	512	N.A.	512
EDACS EA Group Sets	512	N.A.	512
P25 Group Sets	512	512	512
Groups per Group Set	1250	1250	1024
Total Groups	13824	13824	13824
Group Alpha (alias)	1250	1250	1024
Group Long Alpha (alias)	1250	1250	N.A.
I-Call Sets	15	15	15
I-Call per I-Call Set	255	255	255
I-Call Alpha (alias)	1250	1250	1024
I-Call Long Alpha (alias)	1250	1250	N.A.
Total I-Call	1344	1344	1344
Phone Call Sets	15	15	15
Phone Calls per set	255	255	255
Phone Calls Alpha (alias)	1250	1250	1024
Phone Call Long Alpha Non-Reprogrammable and Reprogrammable (alias)	1250	1250	N.A.
Total Phone Calls	1344	1344	1344
Total Trunked Frequency Sets	512	512	512
Frequencies per Trunk Frequency Set	1024	1024	1024
Total Conventional Frequency Sets	512	512	512
Conventional Channels per Conventional Frequency Set	1000	1000	1000
Total Conventional Channels per Radio	1250	1250	1024
Total P25 Conventional Frequency Sets	512	512	512

ITEM	LIMITS		
	XL-Radios	XG-100M w/CH-100	All Other RPM2-Supported Radios
P25 Conventional Channels per p25 Conventional Frequency Set	1000	1000	1000
Total P25 Conventional Channels per Radio	1250	1250	1024
Conv Alpha (Both P25 Conventional and Conventional)	1250	1250	1024
Conventional Long Alpha (alias)	1250	1250	N.A.
Total Unique Freq pairs (Conventional, P25 Conventional, and Trunked)	2500	2500	2500
Total Number of Zone Entries per Zone	1024	48	32 (48 for XG-75Pe)
Sites per Site List	512	512	512 for XG-75M & XG-100M/CH-721 All others N.A.
Max Scan Tables (used for the minimized scan option)	255	255	255
Max Zones	250	250	50
Max Channels/Knobs per Zone	1024	48	48

Table 4-2: Radio Application Support Matrix

FEATURE	XG-75P XG-75Pe	XG-25P	XG-15P	XG-25M	XG-75M	XG-100M/ CH-100	XG-100M/ CH-721	XL Portables	XL Mobiles
Write & Read Personality	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Override LID and Save As	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Override using Specify	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Override using CSV	-	-	-	-	-	-	-	Yes	Yes
Load BurnApp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	-
Load BootApp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	-
Load Firmware	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Load Encryption Modules	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VAC Config Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Discover VA Files	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Display VA Files	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Extract and Save VA files	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Program VA files	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Delete VA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-

FEATURE	XG-75P XG-75Pe	XG-25P	XG-15P	XG-25M	XG-75M	XG-100M/ CH-100	XG-100M/ CH-721	XL Portables	XL Mobiles
Format Flash	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	
Multiple Load Code (BootApp, BurnApp, Radio Firmware, AES, DES)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Load MCU	-	-	-	-	Yes	-	-	-	-
Load CH-721 Main App	-	-	-	-	-	-	Yes	-	-
Load HHC-731 Main App	-	-	-	-	Yes	-	Yes	-	-
Load OTP	Yes	Yes	-	Yes	Yes	-	-	-	-
Load CH-25 Main App	-	-	-	Yes	-	-	-	-	-
Load CH-100 Firmware via USB	-	-	-	-	-	Yes	-	-	-
Load Radio Firmware & Encryption Modules to CH-100 via USB	-	-	-	-	-	Yes	-	-	-
Command Line Interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

5. HELPFUL TIPS

5.1 GLOBAL SETS

When using a large number of global sets, select the Global Set Tab before editing a personality. This allows all global sets to be loaded before creating/editing a personality. This alleviates a delay with RPM2 having to go out and load all global sets when selecting a global set within the personality the first time.

5.2 USB/WI-FI PROGRAMMING

When connecting to multiple radios simultaneously via the same connection type (USB or Wi-Fi), it is recommended that only one type of radio is connected at the same time, i.e., XL Portable, XL Mobile, or Unity XG-100/CH100.

After loading CCM code (.ccm or .mcm) code to a radio, the radio must be rebooted.



NOTE

Turn LTE off when programming via Wi-Fi.

6. FEATURES/ENHANCEMENTS

Refer to Section 7 for a list of problems resolved with this release.

6.1 CCM APPLICATION LOADING

Added a new code loading option, "LTE CCM Application," to the Load Code Connection Screen. Selecting this option allows an .hbf file to be uploaded to a radio. This code type is a bundle format which allows for the uploading of MCPTT software for the CCM, firmware, or Wi-Fi Certificates.

6.2 CONVENTIONAL HOME EMERGENCY ON A PER ZONE BASIS

Added a new set of controls to Zones which allows for a Conventional Home Emergency to be set for each individual zone.

6.2.1 System/Channel

The system control allows a P25C or Conventional System to be set as the Home System for a Conventional Emergency. A channel must be selected for the system.

6.2.2 Use When On Trunked System/Group

The Conventional Home Emergency is normally only used when the zone is on a Conventional or P25 Conventional System. Selecting this checkbox causes the Conventional Home Emergency to also be used when the zone is on a Trunked System/Group.

6.3 CONFIGURABLE LOW BATTERY WARNING

Added a Low Battery Warning to the Alert Options screen. This control allows a user to configure at what percentage the radio alerts the user of a low battery. It can be set between 50%-5% with a default value of 5%.

6.4 MESSAGE TO IGNORE KEYPAD LOCK

Added a new drop-down selection "Message to Ignore Keypad Lock" to the Status/Message Options. This control allows a single Message to be selected that will, when set to a programmable button, ignore a keypad lock situation and still allow the button to be used.

6.5 MCPTT SYSTEM TYPE

The MCPTT System has been redesigned to remove unused controls and add a Provider selection.

6.5.1 MCPTT Provider

A new provider selection has been added. More providers will be added as support is added.

6.5.2 Auth Domain

The Authentication Domain is no longer a necessary field and can be left blank for systems that do not have one.

6.5.3 Network Selection

Wi-Fi has been removed temporarily until support is added.

6.6 TALKGROUP DENIED DISPLAY

Added a new checkbox to the P25 Trunking Miscellaneous Options. This causes the radio to display a special indication when it goes to a CCScan mode due to a Talkgroup Denied Message.

6.7 XL SPEAKER MIC OPTION BUTTON

Changed the “Key Extreme RSM Option” button to “Key RSM Option” to allow for support for other speaker microphones that have options buttons.

6.8 ENCRYPTION CONTROLS VIA EXTERNAL OPTIONS

Added **Encryption Enabled** and **Encryption Received** as valid Outputs for the External Output Control lines in the External I/O options screen. Added “Private” and “Normal Transmit Inhibit” as options for the Auxiliary Inputs.

6.9 HIGH POWER EMERGENCY CONFIGURATION

Added a new checkbox for **High Power Emergency** to the Supervisory Options screen. When selected, this option causes XL-400P radios to send Emergency Alarms and Calls at high power.

6.10 SYSTEMS ON CHANNEL KNOBS / GROUPS ON RAMP BUTTONS

Added a new section in the Programmable Switches screen for the XL-Portable Channel Knob. The function of the knob can now be set to SYSTEM to allow for changes to the Channel Knob to change the system rather than the group. When this is set, a user cannot set a system to the A/B/C/D switch, or set a power up system. New Operations have also been added to the Portable Programmable Buttons screen to allow for Group/Channel Up/Down functionality to be set to buttons. The Channel Up and Channel Down operations in the Mobile Programmable Buttons have been renamed to Group/Channel Up and Down to match the Portable Programmable Buttons of the same function.

6.11 USER PROFILE EXPORT

Added a new export option to the User Profile Connection Screen. Exporting the User Profile creates an XMZ file in the **Export** directory. This file can be used with DMF to remotely program a radio with a User Profile.

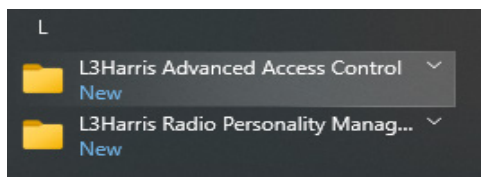
6.12 L3HARRIS REBRANDING

L3Harris rebranding. The following sections illustrate the differences users will encounter when installing/using the rebranded version of RPM2.

6.12.1 File Directories and Storage

The application is installed to a new directory by default. The previous default directory, **C:\Program Files (x86)\Harris Radio Personality 2** has been replaced and the new version of the application is installed to **C:\Program Files (x86)\L3Harris Radio Personality Manager 2**.

Likewise, a rebranded version of the AAC Administrator application is installed in an L3Harris directory rather than a Harris directory in the **C:\Program Files (x86)** directory. This copy of AAC Administrator is installed prior to the installation of the rebranded copy of RPM2. These new application locations are also available in the Widows Start Menu on the installation machine.



On some computers, the older Start Menu Shortcuts may not be removed automatically; therefore, the Harris Headings may also be shown. Since the older (Harris) applications to which the shortcuts point have been removed, the user may see a message to that effect if the shortcuts are clicked. These messages can safely be ignored and/or the user can manually remove the shortcuts if desired.

User data such as personality files, user profiles, and voice announcement/audio files, etc., is unaffected by these installation location changes and those files are still located in the same file folders in which the user data was previously stored. User preferences and listing of most recently used files (personalities and code) are relocated to an updated storage directory in the users **Local Application Data** folder so that no loss of data occurs and the transition is seamless to the newly branded application. Any changes to these preferences use the new locations. Going forward, RPM2 pulls this data from the new locations.

One final change to the installer is the inclusion of an updated License Agreement which must be accepted for installation to proceed. The details of this agreement have not changed and updates were made to reflect new branding and copyrights. A copy of this file (**License.rtf**) is in the RPM2 installation directory.

6.12.2 Running the Program

Execution of the application(s) displays the new L3Harris-branded splash screen:



Updated branding is included on the main screen and About boxes:



References, links, and copyrights for the application and supporting DLLs reflect L3Harris as the producer/owner of the appropriate components.

Additionally, new L3Harris splash screens have been provided for both the XL Portable and XL Mobile radios. These new screens are copied to the RPM2 installation directory during the installation process.



Beyond those branding changes, the RPM2 application functions as it always has with the only function changes to the application being the addition of new features and updates described in this .

6.13 MCPTT SYSTEM CHANGES

6.13.1 Provider Field

A Provider field has been added to the MCPTT system to support multiple vendors. This defaults to Southernlinc; currently the only provider supported.

6.13.2 Auto-Registration

A new checkbox has been added to allow a radio to use its own internal identity to log into an MCPTT provider without using an Authentication Username or Password. When this option is selected, the Username and Password fields are set to empty and the Username, Domain, and Password fields are disabled. The Southernlinc Provider uses this setup as the default.

6.14 SERIAL TUNNELING SUPPORT

A new protocol has been added to the Data Interfaces section of the Data Options.

6.14.1 Serial Tunneling Mode

The supported modes include the following:

- Static serial tunneling.
- Network initiated serial tunneling (NiST)
- Client initiated serial tunneling (CiST)

6.14.2 Packet Size

Used for all Serial Tunneling modes; configures the maximum number of bytes stored by the serial tunneling buffer. When the buffered data reaches its maximum limit, it is encapsulated and sent to the destination server as an IP/UDP packet.

6.14.3 Packet Time

Used for all Serial Tunneling modes; configures the maximum time (in milliseconds) that the radio waits for the next byte (character) from the Client before the buffered data is encapsulated by and sent to the destination server as an IP/UDP packet.

6.14.4 Destination Address

Used for Static Serial Tunneling mode; configures the radio destination IP address.

6.14.5 Destination Port

Used for Static Serial Tunneling mode; configures the radio destination UDP port.

6.14.6 Source Port

Used for Static Serial Tunneling mode; configures the radio source UDP port.

6.14.7 Network Port

Used for NiST mode; configures the network UDP port.

6.14.8 Wait Time

Used during NiST or CiST modes; configures the wait time within which the client or network can send packets without returning to the IDLE state.

6.14.9 Discovery Time

Used during CiST mode; configures time within which a client can receive a packet from a server when establishing a communication link.

6.14.10 Client Port

Used for CiST mode; configures the source UDP port used in the packet sent to the network.

6.14.11 Serial Tunnel Network Table

Used during CiST mode; contains routes for the Network Address Table. The client sends packets to the addresses in this table until it receives a response and establishes a session.

6.15 DUAL SPEAKER MODES

This XL-400P only feature added to the Audio Settings Options allows the user to select how the two speakers handle audio output.

- Default - Front and rear speakers combine to provide full spectrum audio.
- Front - This mode disables the rear speaker and provides full spectrum audio from the front speaker.
- Rear - This mode disables the front speaker and provides full spectrum audio from rear speaker.
- Stereo All-pass - This mode provides full spectrum audio from both sides of the radio.

6.16 VOLUME CONTROL SELECTION

The volume knob control can now be modified to give the user greater control over the ESM accessory and only takes affect when the ESM is attached. This setting can be used to only allow the ESM to change the volume, to only have the radio control the volume, or to have both ESM and Radio allow for volume control changes when the ESM is attached to the radio.

6.17 EMERGENCY REGISTRATION

This is a new selection available in the **Miscellaneous Options** of P25T systems. When enabled, a site accepts a radio it has denied if that radio is in an emergency state.

6.18 USER ALIAS LIST INCREASE

The number of User Aliases allowed for XL Radios has been increased from 3000 to 5000.

6.19 KVL MODE LLA

A new programmable button option and programmable menu have been added for XL radios. It puts the radio into KVL LLA Mode, allowing the user to load Link-Layer Authentication (LLA) Keys via a KVL.

7. PROBLEM RESOLUTION

The following issues were resolved with this release:

REFERENCE NUMBER	DESCRIPTION	FIXED IN
PROD00233699	RPM2 R15A/R16A - Selecting multiple firmware files to send to XL radios results in RPM2 failure to load firmware getting stuck at around 12%.	R16C
PROD00233632	RPM2 - Customer would like to be able to program a power up system/group, have systems on the ABCD switch, with Ignore A/B(C/D) set.	R16B
PROD00233688	RPM2 R16A0080 - ACC Admin indicates an error with Master/Distribution Dongles: "The dongle is corrupted. Please erase it and start over."	R16B
PROD00232749	RPM2 R16A - After programming an XL Mobile with RPM2 R16A and reading back the personality file, AGC gets turned on by itself (on the WRITE).	R16B
PROD00233000	RPM2 is missing parameter help information/pages for the recently added features like "Configurable Alert Tones."	R16B
PROD00232873	RPM2 R16A0080 and legacy RPM application cannot be executed on the same machine.	R16B
PROD00229810	RPM2 R14D "Talk Around Grant Tone" parameter NAME needs to be changed to "Talk Around Indication Tone" and HELP screen needs information.	R16A
PROD00231155	RPM2 R15A0245 errantly filling in ZONE Conventional Home Emergency SYSTEM/CHANNEL and BeOn ProFile fields when opening an RPM2 R13B personality file.	R16A
PROD00230965	RPM2 R14D .CSV Import feature ERROR screen needs more clarification about the error locations in the .CSV file.	R16A
PROD00225009	RPM2 User Manual needs to state that personality file names must be unique and 16 characters or less.	R15A
PROD00225100	XG Radios (Mobiles and Portable) using RPM2 R14C/R14D - Cannot select LAST channel/group selection in any ZONES.	R15A

REFERENCE NUMBER	DESCRIPTION	FIXED IN
PROD00228968	Cannot open an RPM R14C05 file in RPM2 R14C/R14D - Getting RPM2 error "Error: This Personality file is not compatible with this version of software."	R15A
PROD00228925	RPM2 R14D has incorrect default VCH DHCP Subnet Mask and Low/Hi IP address in the help menu.	R15A
PROD00223043	RPM2 (R12-R14B) - Adding in certain 800 MHz TX Frequencies to Trunked freq Set in GRID view causes RX Frequency to leave decimal portion as all zeros.	R15A
PROD00225903	RPM2 R14D - Refreshing Wi-Fi connections causes RPM2 to crash while RPM2 is writing code/pers to 8+ radios at the same time.	R15A
PROD00226863	RPM2 R14C/R14D - When program an XL-200P, RPM2 reports "Radio Program Failed: No Personality Selected"- Individual Call Minimum Ring Volume" parameter.	R15A
PROD00226227	XL400P using RPM2 R14D - After writing personality file using a "NFPA RSM Failure Voice Annunciation" VA File #361 (or higher), can no longer read personality file.	R15A
PROD00225101	RPM2 R14C-R14D is flagging an "ABCD switch" error when Radio Type is not a XL Portable, but when personality file also contains an XL Portable Radio Type.	R15A
PROD00223608	RPM2 R14B0014 error checking is not working properly when the GPS "Position Format" is set to "LAT LONG DD" and Radio Type is "XL Portable."	R15A
PROD00224041	RPM2 R10A11-R14B0014 - Radio Maintenance Utility HELP does not open when selecting "Help Topics" from HELP tab. RPM2 says "Failed to launch help."	R15A
PROD00224080	RPM2 R14B0014 Feature Data WRITE issue - Feature Data MENU selection does not remove previous radio from list after its disconnected from PC.	R15A
PROD00224783	RPM2 R13B/R14B P25 WAN Lock-Out feature issue - The second system, when added with a license present prevents the radio from being programmed.	R15A

REFERENCE NUMBER	DESCRIPTION	FIXED IN
PROD00222386	RPM2 R13B0123 - P25 Group Set List/Grid View has a shifted to right view when maximized and opened on larger sized widescreen monitors.	R15A

8. INSTALLATION/UPGRADE PROCEDURES

Perform the following to install Radio Personality Manager 2 (RPM2):

1. Ensure that your account belongs to a group that can install software; preferably the local **Administrators** group.
2. Ensure that an older version of RPM2 is not currently running.
3. Either mount the ISO file or insert the CD/DVD into the appropriate optical drive.
4. Execute **setup.exe** by navigating to the correct drive in Windows Explorer.
5. As **setup.exe** executes, it will:
 - a. Display a list of prerequisites that it needs to install. The prerequisites may include one or more of the following:
 - Microsoft .NET Framework 4.6.2 Full (*See NOTE below*)
 - Microsoft Visual C++ 2017 Redistributable Package (x86) (32-bit and 64-bit OS)
 - Microsoft Visual C++ 2017 Redistributable Package (x64) (64-bit OS only)
 - Bonjour SDK
 - L3Harris Radio USB Driver (x86) (32-bit OS only)
 - L3Harris Radio USB Driver (x64) (64-bit OS only)
 - L3Harris Advanced Access Control (*See NOTE below*)
 - DMF Certificate Utility
 - b. Each prerequisite may have its own installation dialog as well as licensing terms that must be accepted.



NOTE

In rare cases, prerequisite installation may show a failure.

- c. If a prerequisite must be upgraded, a dialog may pop-up stating that the program is upgrading and requests the user to confirm proceeding.
 - d. After all prerequisites are installed, the main RPM2 installer opens.
 - e. Click through the installation dialog screens, accept the license, and close once the installation is complete.
6. **(Recommended)** Reboot the PC. In rare cases, a reboot is required for RPM2 to function properly.



The Microsoft .NET Framework 4.6.2 requires a reboot after installation. Declining reboot after it is installed causes the L3Harris Advanced Access Control installation to fail. If the installation does not continue after a reboot, rerun the **setup.exe** and the installation continues from where it left off.

9. UNINSTALL

To uninstall the RPM2 application, perform the following steps:

1. Open the Control Panel.
2. Go to **Programs → Programs and Features**.
3. Select **Radio Personality Manager 2**.
4. Click **Uninstall** and follow the wizard.

Even though the application is uninstalled, any user data (i.e., configuration settings, folders, files, etc.) created after running and configuring RPM2 remains on the machine. This data must be removed separately.



Following the uninstall steps uninstalls **only** the RPM2 application. It **does not** uninstall any of the prerequisite applications that may have been installed when the application was installed. The same steps apply to uninstall any of the prerequisite applications.



If RPM2 R9A is uninstalled to revert to previous versions, the USB driver must be re-installed. Please contact Software Services to request a copy of the USB Driver.

10. LICENSING

RPM2 requires a valid license for usage. Licenses are viewed and controlled through the Advanced Access Control (AAC) Administrator application that is installed as a prerequisite. See the *AAC and RPM Overview Manual*, 14221-2100-3000, for more information.

If a licensed version of RPM already exists on the machine, the license must be updated for use with RPM2. If that is the case or a new license is required, please contact Software Services to get a valid license.

11. NOTES ABOUT THIS RELEASE

11.1 SECURITY KEYS DELETED FROM DONGLE

In Advanced Access Control (AAC) Administrator R2A, the user can add Security Keys to a dongle for use with RPM2. Security Keys are formerly known as ESKs in RPM and are used for Personality Lock in RPM2. If Security Keys have been added onto a dongle via AAC Administrator R2A (that is installed with RPM2) and RPM R11A or R12A is installed, there is a risk that the Security Keys may unintentionally be deleted if the dongle is used with both RPM and RPM2.

To mitigate this risk, it is suggested that the user have separate dongles for use with RPM R11A or R12A and this version of RPM2.


If this is not an option, special care will need to be taken to ensure that a copy of the Master Dongle that contains the Security Keys is kept safe and is not plugged into a computer with RPM R11A or R12A installed onto it (Reference TR: PROD00124553).



Once Security Keys have been deleted from a dongle, **there is no recovering them.**

11.2 ONE OR MORE USB RADIO(S) NOT DISPLAYED IN RADIO INTERACTION TAB OR FEATURE DATA SCREEN

If one or more connected USB radios are not visible on the Radio Interaction Tab or the Feature Data screen, try the steps below until the radio(s) reappear.

1. If the L3Harris Key Loader or original RPM is open, close it. Proceed to Step 2.
2. Leave the Radio Interaction Tab/Feature Data Screen and return or press the Refresh button  (Radio Interaction tab only).
3. Turn the radio(s) off and then back on.
4. In rare cases, restarting RPM2 may be necessary to see the device(s) again.

11.3 CANNOT IMPORT GLOBAL SETS FROM RPM

Currently, there is no way to use or copy Global Sets from RPM into RPM2. However, there are two ways to get the Global Sets from RPM into RPM2.

1. Open an RPM Personality in RPM2 containing the desired Global Set(s).
2. Create and Save a Personality in RPM that contains only Global Sets. Open that Personality in RPM2.

In both of those cases, you will want to click the specific Set type under Sets in the Personality Rail that contains the Set that you wish to make Global.

As seen in Figure 11-1, the following three steps are outlined.

1. In the Grid View that is displayed, click on the blue row header to select the entire row.
2. Right-click on the row.
3. Select "Make Global."

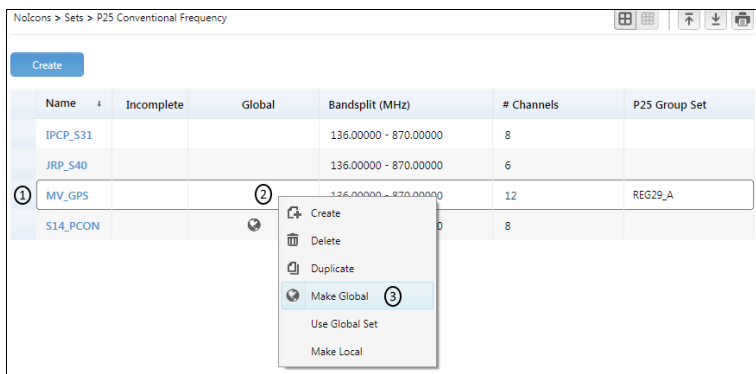


Figure 11-1: Make Global



Global Sets in RPM and RPM2 are two separate entities (files) and any changes made to one do not affect the other.

11.4 WI-FI RELATED ISSUES

Please see Section A.9 for more information on Wi-Fi issues and resolution.

11.5 PRESENCE OF EXTRA NOISE AT THE END OF A WAV FILE

When generating WAV files using some tools, 46 bytes of PCM data is populated instead of 44 bytes, resulting in an extra BOOP or BEEP noise played at the end of the WAV File. L3Harris recommends using Audacity, Soundforge Pro, or other known tools that generate WAV Files correctly. The extra noise at the end can also be removed by using “Audacity.”

11.6 VOICE ANNUNCIATION SUPPORT FOR GLOBAL SETS

It is not possible to select Voice Annunciation Files in Global Sets since there is no option to select a VAC Config File in Global Sets and Lists. The config file can be selected within a personality only.

When a Local Set has been made Global with VAC Files configured, RPM2 stores the VAC file details in the file but does not display it in the Global Set page. When the same Global Set file is used within the Personality, the selected VA Files details can be seen.

11.7 RPM2 INSTALLATION/UPGRADE FAILED DUE TO PRESENCE OF LATEST MICROSOFT REDISTRIBUTABLES

RPM2 installation or upgrade could fail randomly when a computer has the latest versions of Microsoft 2017 redistributables installed. When this failure is encountered, uninstall the following and reinstall RPM2.

- Microsoft Visual C++ 2017 Redistributable Package (x86)
- Microsoft Visual C++ 2017 Redistributable Package (x64)

11.8 USING SECONDARY DISTRIBUTION DONGLE TO LOCK PERSONALITY

RPM2 does not support locking a personality using a Secondary Distribution dongle. Use a Master or Distribution dongle to lock a personality to a dongle.

12. RELATED DOCUMENTATION

DOCUMENT TITLE	DOCUMENT NUMBER
AAC and RPM/RPM2 Overview Manual	14221-2100-3000
ProFile Manager Software Release Notes	14221-1100-8250
Voice Annunciation Feature Manual	14221-7200-6110
RPM2 User Manual	14221-1100-2060
L3Harris Device Management User's Manual	14221-2100-2010
L3Harris Device Management Software Release Notes	14221-2100-8030

13. TECHNICAL SUPPORT

L3Harris' Technical Assistance Center (TAC) resources are available to help you with overall system operation, maintenance, upgrades, and product support. TAC is your point of contact when you need technical questions answered. Product specialists, with detailed knowledge of product operation, maintenance, and repair, provide technical support via a toll-free telephone number (in North America). Support is also available through mail, fax, and e-mail. For more information about technical assistance services, contact your sales representative, or call the Technical Assistance Center directly at:

North America: 1-800-528-7711

International: 1-434-385-2400

Fax: 1-434-455-6712

E-mail: PSPC_tac@l3harris.com

APPENDIX A WI-FI PROGRAMMING



Due to numerous issues with discovering and programming radios connected to Enterprise Wireless networks, it is **strongly** suggested that a single Access Point Wireless network be used for programming radios with RPM2. See Section A.7 for more information.



These instructions assume the user has a basic familiarity with Wireless (Wi-Fi) networks, their configuration, and how to connect devices. If you are unfamiliar with the terms and/or procedures mentioned in these instructions, please contact your IT department for help before attempting to configure Wi-Fi programming.



For XL radios to be discoverable on the Wi-Fi network, your wireless router must be configured to allow Multicast (mDNS). This varies by router manufacturer; refer to your router's documentation for specific settings needed to enable Multicast (mDNS).



Turn LTE off when programming via Wi-Fi.

A.1 OVERVIEW

Perform the following to program an XL portable over Wi-Fi. For first time setup, see Section A.8.1.

1. Configure the Access Point (Section A.2).
2. Configure the personality (Section A.3).
3. Configure the RPM2 application (Section A.4).
4. Put the radio in Wi-Fi Programming Mode (Section A.5).
5. Discovery and programming in the RPM2 application (Section A.6).
6. Support for Enterprise Wireless Networks (Section A.7).
7. Helpful Hints (Section A.8).

A.2 CONFIGURE THE ACCESS POINT

- Setup an Access Point (wireless router) as follows. The **bold** values provided below are the default values in the personality.
 - Wireless Networking Name (SSID): **harrisradios**
 - Shared Key (Network Password): **password**
 - Wireless Authentication/Security Mode (Encryption Type):
WPA

WPA and **WPA2-PSK** are the available Encryption Types in the RPM2 application
- Ensure that the Access Point has Multicast (mDNS) enabled. See the second note at the top of Appendix A for more information. There are different methods for enabling this functionality in different routers. Whatever the method is for the router, Multicast (mDNS) messages must be configured to be relayed (allowed) and not filtered out. This functionality may be referred to as “Snooping,” “Multicast,” or “Promiscuous mode” depending on the router manufacturer. Refer to the router manufacturer’s website or documentation for details on how to enable this functionality for your router.

A.3 CONFIGURE THE PERSONALITY

For a radio to be programmed over Wi-Fi, the active personality on the radio must be configured for connecting with the values that were set in Section A.2. The following steps detail how to configure an existing XL Portable personality.

1. In the personality, navigate to **Options → Network Configuration**.

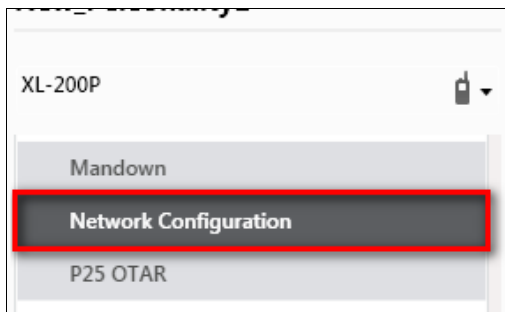
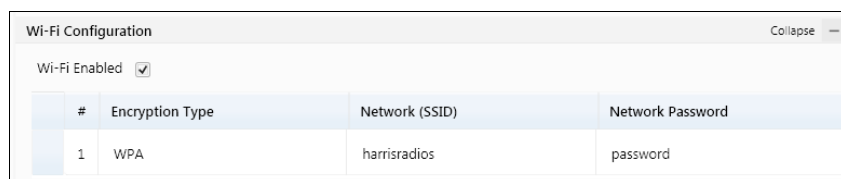


Figure 13-1: Options → Network Configuration

2. Under the Wi-Fi Configuration section, set the **Encryption Type**, **Network (SSID)**, and **Network Password**.



Wi-Fi Configuration Collapse —

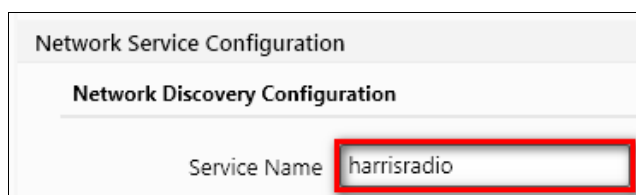
Wi-Fi Enabled ☒

#	Encryption Type	Network (SSID)	Network Password
1	WPA	harrisradios	password

Figure 13-2: Wi-Fi Configuration

3. Under Network Service Configuration, the default values can remain the same. If the wireless network is managed by another department, please coordinate with them to get it setup correctly.

The **Network Discovery Configuration → Service Name** is a Unique name used by RPM2 and radios to communicate with each other. There is more information about this in Section A.8.2.



Network Service Configuration

Network Discovery Configuration

Service Name

Figure 13-3: Service Name

4. After the personality is configured and saved, write it to the radio over USB and then activate it.

A.4 CONFIGURE THE RPM2 APPLICATION

To ensure that RPM2 can discover radios over Wi-Fi, ensure that the **Enable Wi-Fi** checkbox is checked on the RPM2 Preferences screen as shown in Figure 13-4. This checkbox is unchecked by default.

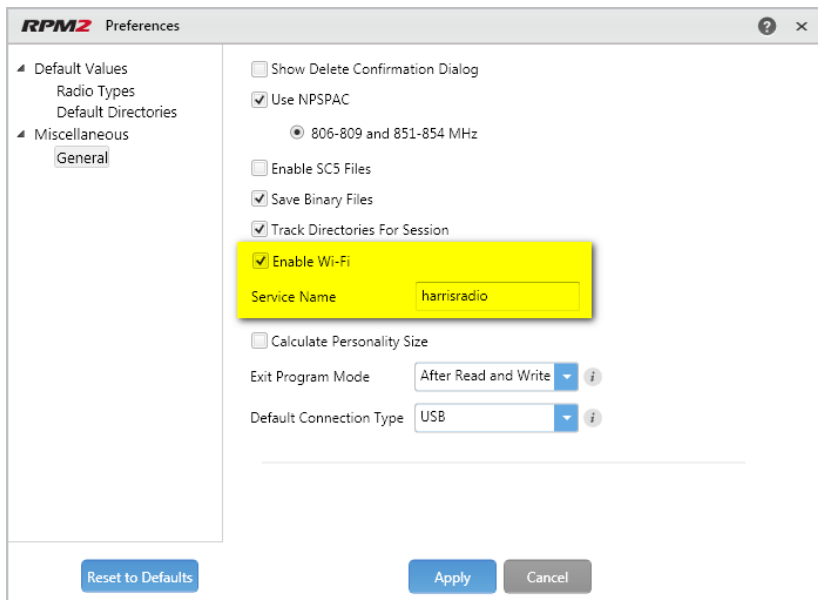


Figure 13-4: Enable Wi-Fi in RPM2



Also, as shown in Figure 13-4, the **Service Name** must be updated to reference the value in the active personalities for the radios you need to discover. See step 3 in Section A.3 and Section A.8.2 for more information.

For default operation using the network as described in Section A.2, no other configuration of the radio or RPM2 is required.

A.5 PUT THE RADIO IN WI-FI PROGRAMMING MODE

Refer to the radio's operator manual for instructions on how to put the radio into Wi-Fi programming mode.

A.6 DISCOVERY AND PROGRAMMING IN THE RPM2 APPLICATION

1. Start RPM2.
2. Disconnect the radio from the programming cable.
3. Select the Radio tab  and click the Wi-Fi connection button .

4. When the Wi-Fi connection button is pressed, a “Discovering Wi-Fi Radios” message is displayed for several seconds and the radios connected to that access point with that Service Name populate the connection list.



To connect over Wi-Fi, the currently active personality **MUST** have the correct Wi-Fi parameters. Therefore, care must be taken that all personalities on a given radio have the correct Wi-Fi parameters for the desired network. Otherwise, activation of another personality on the radio will result in the inability to establish a Wi-Fi connection.

5. Select a radio or radios and perform the desired action. Only Read Personality, Write Personality, and Load Code are supported over Wi-Fi for the XL Portable. See the table below for the supported combinations.

Table A-1: Wi-Fi Feature Support

	SINGLE RADIO	MULTIPLE RADIOS (UP TO 16)
Read Single Personality	✓	✗
Read Multiple Personalities	✓	✗
Write Single Personality	✓	✓
Write Multiple Personalities	✗	✗
Load Single Code File	✓	✓
Load Multiple Code Files	✓	✓
Voice Annunciation	✗	✗
User Profiles	✓	✓
Feature Data	✓	✓
Radio Name	✓	✗
Install Splash Screen	✓	✓

6. In the Status Panel, all Wi-Fi related actions will have the prefix of “WIFI.”

To help in displaying the radios, the “Connection” and “IP Address” columns are sortable.



NOTE

If the Access Point is not configured to the default values from Section A.2 and the active personality in the radio is removed, the radio loses connection to the Access Point and must be connected over USB to write/activate a personality to reconnect to the Access Point.

A.7 RPM2 WI-FI SUPPORT FOR ENTERPRISE NETWORKS

Enterprise Networks have certain limitations when it comes to Discovering/Programming Radios in RPM2. There is a 4500 second (75 minute) caching affect inherent to implementation with the Cisco® Wi-Fi solution that utilizes the Access Point (AP)/Wireless LAN Controller (WLC) components. Radios remain 'seen' in RPM2 even after the radio leaves Wi-Fi or is turned off. It is cached in RPM2 for the 4500 seconds. This issue has only been observed with the Cisco AP and WLC solution, however other enterprise wireless solutions may observe this caching affect. Operation with a lower tiered Wi-Fi router that does not operate with a WLC will likely not observe this behavior. Please see Release Notes for Media Kit SK-019007-001, version R7A06 for more information.

A.8 HELPFUL HINTS

A.8.1 Initial Setup and Configuration

Since radio discovery is dependent on if Multicast (mDNS) messages are being received by RPM2, it is best to keep things as simple as possible. Here are the suggested steps if this is being setup and configured for the first time.

1. Configure the Access Point with the default personality values provided in Section A.2.
2. Create a basic personality with a single system, set and channel, write it to the radio, and activate it over USB.
3. Complete Sections A.4 through A.6.

If the radio was not discovered in RPM2 but an IP address is displayed on the radio screen, this may mean that the Multicast (mDNS) messages are not making it through the Access Point. Consult the Access Point's manual and make sure that those messages are not being filtered out.

A.8.2 Router Notes

It is our expectation that any off-the-shelf router which supports mDNS protocol messaging should work and a number different routers by different manufacturers have been used variably in development, testing and support of this feature. The ASUS RT-86U router has been successfully employed (along with other ASUS RT models). At this point, L3Harris does not plan to test additional third-party routers. For specific details on router setup, refer to the documentation provided by the router manufacturer.

A.8.3 Grouping Radios by Service Name

One benefit of using a unique **Service Name** is that it allows the user to create logical groupings of radios to reduce the number of radios discovered in RPM2 and help reduce the overhead of keeping track of which radios have been configured.

For example, if there are 100 radios in Wi-Fi programming mode (see Section A.5) with the same **Service Name**, all 100 radios are displayed in the Radio tab after discovery has been completed. This makes it difficult to select and program multiple radios simultaneously. However, if the **Service Name** in the active personality on 16 of the radios are set to something unique like “fire1” and the RPM2 application **Service Name** (see Section A.4) is also updated to “fire1,” only those radios with a **Service Name** of “fire1” are discovered and displayed in the Radio tab.

A.9 KNOWN LIMITATIONS AND TROUBLESHOOTING

RPM2 can write a personality or load code to 16 radios at a time. Utilizing a Private Wireless Network ensures the best results. Network latency and traffic can negatively affect the reliability of Wi-Fi Programming.

The following sections list Scenarios and Solutions to certain Wi-Fi related problems.

A.9.1 Radio(s) not Visible in Radio Tab

Scenario: The Radio does not show up in the Radio tab while Wi-Fi is selected.

Cause 1: Radio is not in Wi-Fi Programming mode.

Solution 1: Power off the Radio, wait 10 seconds and put the radio in Wi-Fi Programming mode.

Cause 2: Radio does not have the correct Network Configuration.

Solution 2: Connect the Programming cable to the radio and read the Active Personality out of it. Modify the Personality with the correct Network Configuration information. Re-write the Personality back to the radio and place the radio back into Wi-Fi Programming mode.

Cause 3: DNS Discovery has not been started on your machine.

Solution 3: Close the RPM2 application. Go to "C:\Program Files (x86)\Bonjour SDK\Bin\mDNSNetMonitor.exe" and run the application; administrative privileges may be required. Open a Windows Command Prompt with Administrative Privileges and type in "dns-sd -B _harrisradio._tcp" as shown below, where "harrisradio" is the Service Name that is set in the RPM2 application and personality (see Section A.4).

```
Select C:\WINDOWS\system32\cmd.exe - dns-sd -B _harrisradio._tcp
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\bwertz>dns-sd -B _harrisradio._tcp
Browsing for _harrisradio._tcp
Timestamp      A/R  Flags if Domain                Service Type                Instance Name
15:24:47.415   Add    2 14 local.                _harrisradio._tcp.         SL_R8-A40301000125
```

This starts the Discovery Service that is required for RPM2 to be notified that the radios are available.

Open the RPM2 application and verify that the radios are displayed. Close the mDNSNetMonitor and Command Line.

Cause 4: Some other reason.

Solution 4: See Section A.9.5

A.9.2 Process Stuck at 30% or 90% in Status Panel in Progress Tab

Scenario: In Progress tab on Status panel shows a device action that is stuck at 30% or 90% for an extended period and the radio display does not show any changes.

Cause: Usually caused by a lost connection to the radio before, during, or after the processing of the device action.

Solution: Save any personalities that may be open and restart RPM2.

- If the progress got stuck at 30%, the device action may need to be completed again.
- If the progress got stuck at 90%, verify on the Radio that the device action was complete; if not, try it again.

A.9.3 Version Not Updated after Load Code

Scenario: After loading code (radio firmware, encryption module, LTE PEM software, etc.), the Version is displaying old version.



NOTE

When performing Code Loading, it is recommended to power cycle all radios into Wi-Fi mode, then quickly launch the radio code load (up to 16 radios).

Cause: Over Wi-Fi, there is no mechanism for the radio to inform RPM2 that it needs to update the versions.

Solution: Pressing the Refresh button  updates RPM2 with the correct versions.

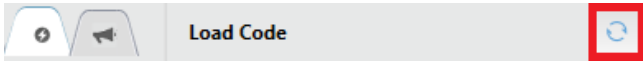


Figure 13-5: Refresh Button

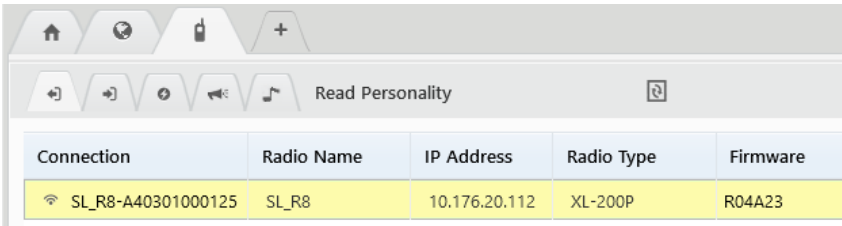


NOTE

Pressing the Refresh button more than 1 time in ten (10) seconds may lead to undesired behavior in the application.

A.9.4 Radio Row Highlighted Yellow in Radio Tab

Scenario: One or more radios are highlighted in yellow in the radio tab.





Read Personality 				
Connection	Radio Name	IP Address	Radio Type	Firmware
 SL_R8-A40301000125	SL_R8	10.176.20.112	XL-200P	R04A23

Figure 13-6: Yellow Radio Row

Cause: The radio is still available in the mDNS cache, but RPM2 is unable to connect to it.



NOTE

If more than one person is connected to the Access Point and is programming Radios, the row for that radio will be highlighted yellow.



For Private Wireless networks, if the radio was turned off within the past 2 minutes, the radio will be displayed until it clears from the mDNS cache.

For Enterprise Wireless networks, please see Section A.7.

Solutions:

- Active personality over-written or new personality activated.
 - a. Press the Refresh button as seen in Figure 13-5. If that does not work, continue.
 - b. Wait 10 seconds and press the Refresh button again. Repeat this step up to 3 more times, waiting 10 seconds in between each Refresh. If it still does not work, continue.
 - c. Verify that the personality in the radio has the correct Network Configuration (may require a Programming cable). If it does not, update it and retry. If the Network Configuration is correct, continue.
 - d. Proceed to Section A.9.5.
- All other cases:
 - a. Press the Refresh button as seen in the previous scenario. If that does not work, continue.
 - b. Wait 10 seconds and press the Refresh button again. Repeat this step up to 3 more times, waiting 10 seconds in between each Refresh. If it still does not work, continue.
 - c. Proceed to Section A.9.5.

A.9.5 Any Other Scenario Not Listed Above

Scenario: Specific Scenario not previously listed or was referred from previous Solution.

Cause: RPM2 is not handling something correctly.

Solutions:

- Turn the radio off and wait 10 seconds. Turn the radio back on into Wi-Fi Programming Mode. After 10 seconds, press the Refresh button as seen in Figure 13-5.
- Restart RPM2 and retry the desired device action.
- If all else fails, contact the Technical Assistance Center (TAC):
1-800-528-7711 (USA)
1-434-385-2400 (International)
PSPC_tac@l3harris.com

APPENDIX B AGC INFORMATION

The Automatic Gain Control (AGC) feature normalizes different speaking levels by automatically amplifying or attenuating speech in the audio stream of a transmitting radio. It provides a maximum of 20 dB amplification and 10 dB attenuation.

The recommendation is to have this feature ENABLED on all radios to compensate for the varying speaking levels of users. Users are highly recommended to hold the radio or speaker/mics as per the User manuals.

AGC Target level: This field is used to increase the target audio level of the AGC algorithm in steps of 6 dB. It is highly recommended to leave the target level at 0 dB to avoid any potential distortion or clipping at the dispatch consoles.

Radios with Noise cancellation capability:

- XL Portable
- XG-100P
- XG-75P/Pe
- XG-100M/CH-100

It is recommended to disable the Noise cancellation in the radio personality. Users can enable Noise cancellation through radio's user interface when entering high noisy environments. It is highly recommended to disable noise cancellation when not needed to avoid the potential risk of degrading audio quality due to improper user operation of radio or speaker/microphone. Refer to radio's operator manual for proper Noise cancellation operation.



NOTE

Noise cancellation enable/disable can be assigned to the A/B switch in the radio personality for XG-75P portables.

Accessories: External microphone gain settings may have to be adjusted for accessories connected to control heads and portables. Example: If a user sounds consistently low on the consoles and the receiving radios when using a specific type of accessory, then the external gain can be increased in the radio personality until the audio levels reach a satisfactory level.



NOTE

Symphony™ consoles have the provision to measure the Active Speech Level for each call it receives from radios. A technician setting up the radios and system can make few test calls and measure the Active speech level of the test calls at the console.

For accessories with active noise cancellation, refer to respective product manuals for configuration and operation.

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About L3Harris Technologies

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space, and cyber domains.