MG90 LTE-A Pro Upgrade Kit Installation

The MG90 LTE-A Pro Upgrade Kit enables the MG90 to operate with the EM7511 radio module. The EM7511 is a FirstNet-ready (LTE B14) CAT 12 radio module. This installation guide shows you how to upgrade the MG90 by:

- Installing the EM7511 Radio Module
- Upgrading the MG90 Software

Before You Begin

Verify that you have the components and tools listed below.

The upgrade kit (part number 6001175) contains the following items:

- EM7511 radio module
- Adapter board
- Thermal pads and shim
- 2 RF cables (green and black)
- 2 M2 screws, 1 M3 screw
- FCC label

The following tools and hardware are required:

- Torx T30 driver
- Phillips screwdrivers (appropriate size for M3 and M2 screws)
- SMA wrench (provided with MG90)

Optional hardware:

- USB 2.0 flash drive (for upgrading MG90 software if not using AMM)

Installing the EM7511 Radio Module

To install the upgrade kit:

1. Disconnect all data cables and power cables from the MG90.
2. Using a Torx T30 driver, remove the four screws securing the top enclosure, as shown in Figure 1.
3. Remove the top enclosure, taking care not to damage the gasket between the top and bottom enclosures.

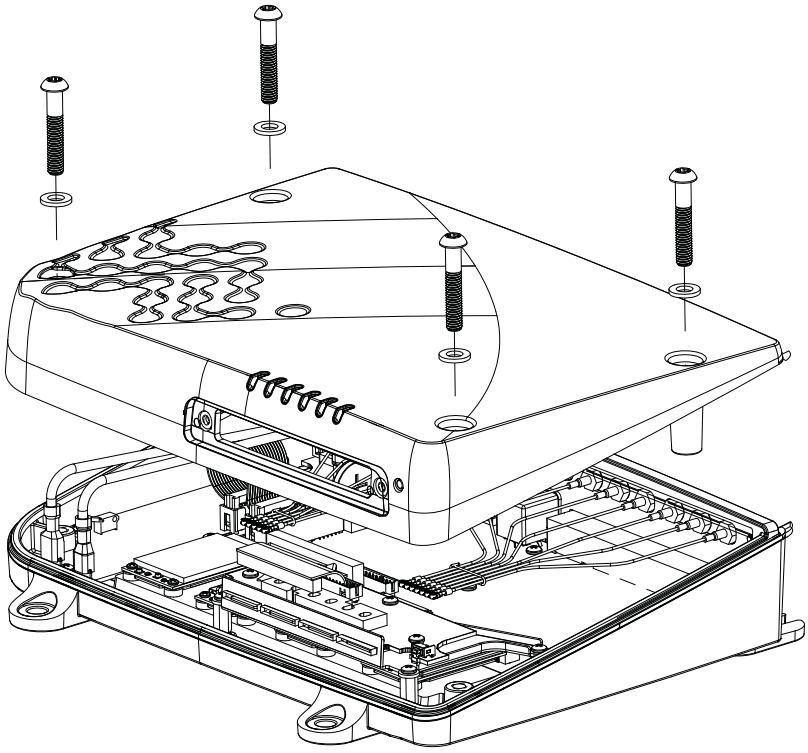


Figure 1: Removing the top enclosure

4. If a radio module is present in the second slot indicated in Figure 2:
   a. Detach the cable(s) from the module.
   b. Remove the radio module and its associated components.

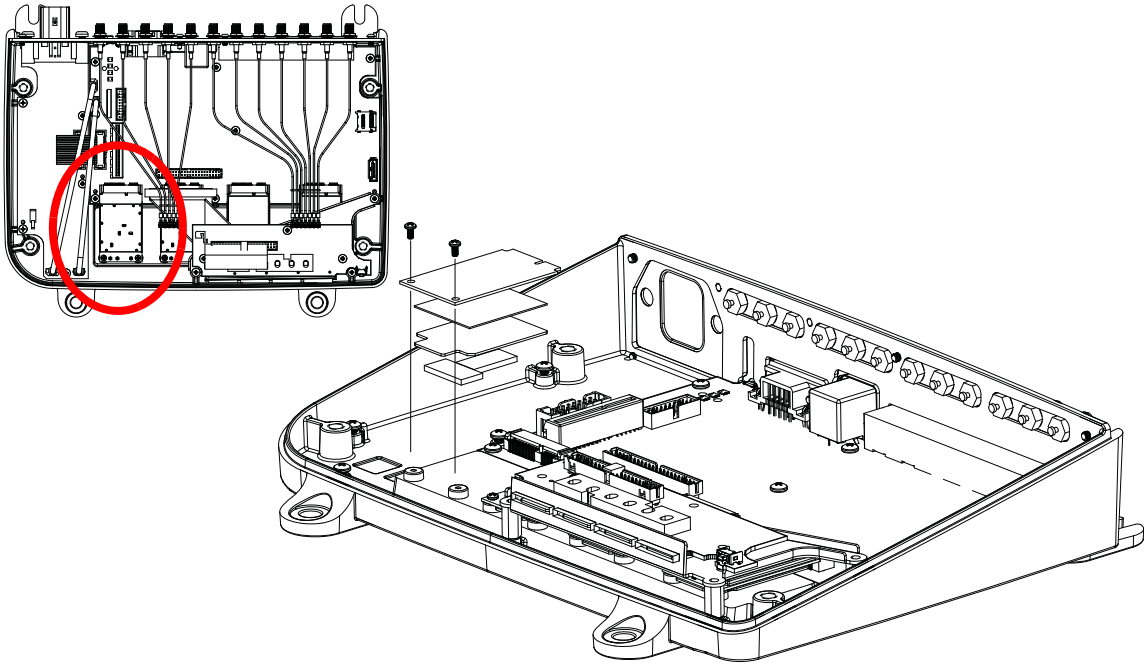


Figure 2: Removing the existing module (if present)

5. Install the Cellular B and Diversity B cables included in the kit. The cable location is defined by the color labels, as shown in Figure 3.

   If you removed a radio module in step 4, you must replace the Cellular B and Diversity B cables with the cables included in the kit.

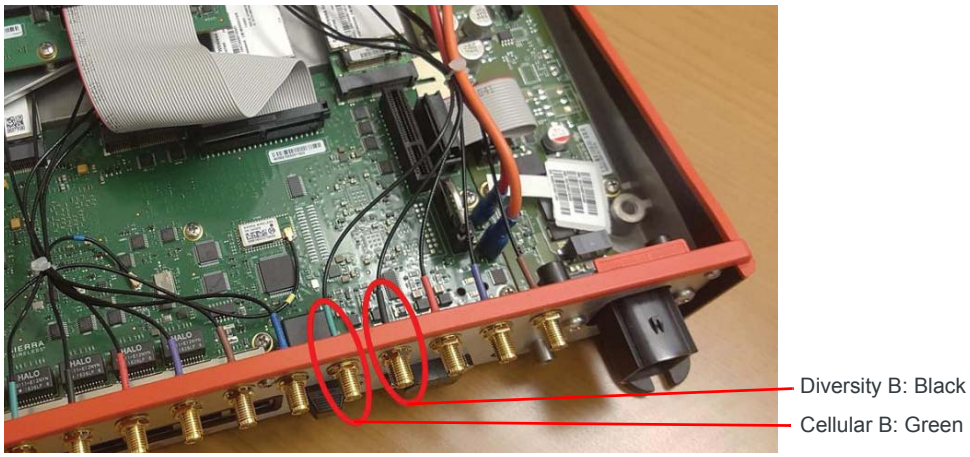


Figure 3: Installing or replacing the cables

6. Install the EM7511 module and kit components as shown in Figure 4. Follow steps **a** to **g**, listed below.

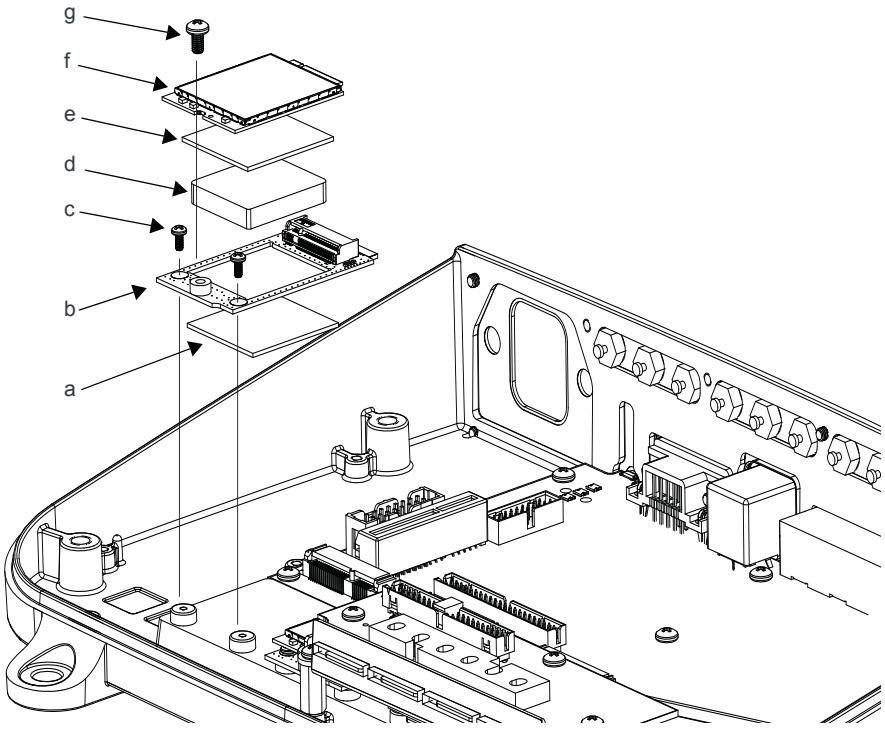


Figure 4: Installing the EM7511 radio module

   a. Attach one thermal pad to the MG90 chassis.

   b. Insert the contacts on the adapter board into the connector on the MG90 main board. For now, there will be a gap between the adapter board and the thermal pad.

c. Secure the adapter board with the two M2 screws.

d. Place the shim through the space provided in the adapter board. Ensure that the shim rests on top of the thermal pad.

e. Place the second thermal pad on top of the shim.

f. Insert the EM7511 module into the connector on the adapter board as shown in Figure 5 (insert the module at a 25° angle, bring downwards, and push fully into the connector).

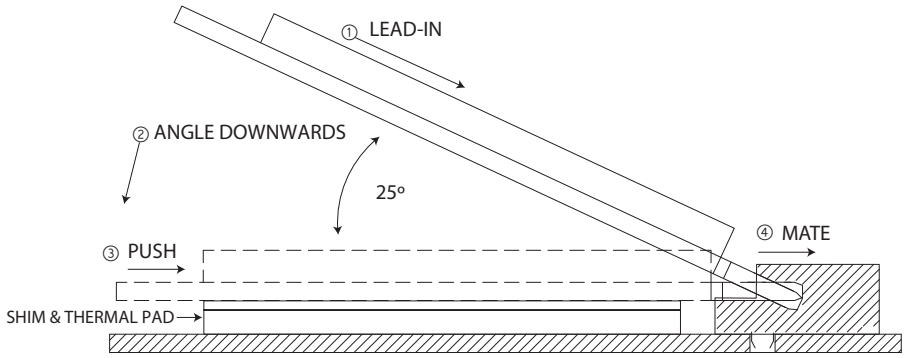


Figure 5: Module insertion

g. Secure the EM7511 radio module with the M3 screw.

7. Connect the Cellular B (green) cable to the connector marked “Main” on the EM7511 module, as shown in Figure 6.

Note: Handle the cables and module carefully, taking care not to damage the connectors.

8. Connect the Diversity B (black) cable to the connector marked “Aux” on the EM7511 module, as shown in Figure 6.

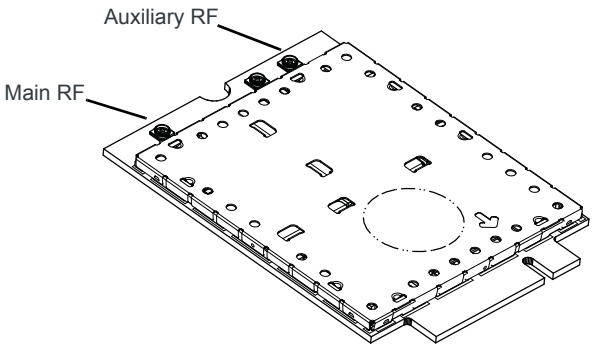


Figure 6: Module connectors

9. Reattach the top enclosure as shown in Figure 7, taking care that the gasket on the bottom chassis is not pinched or misaligned.

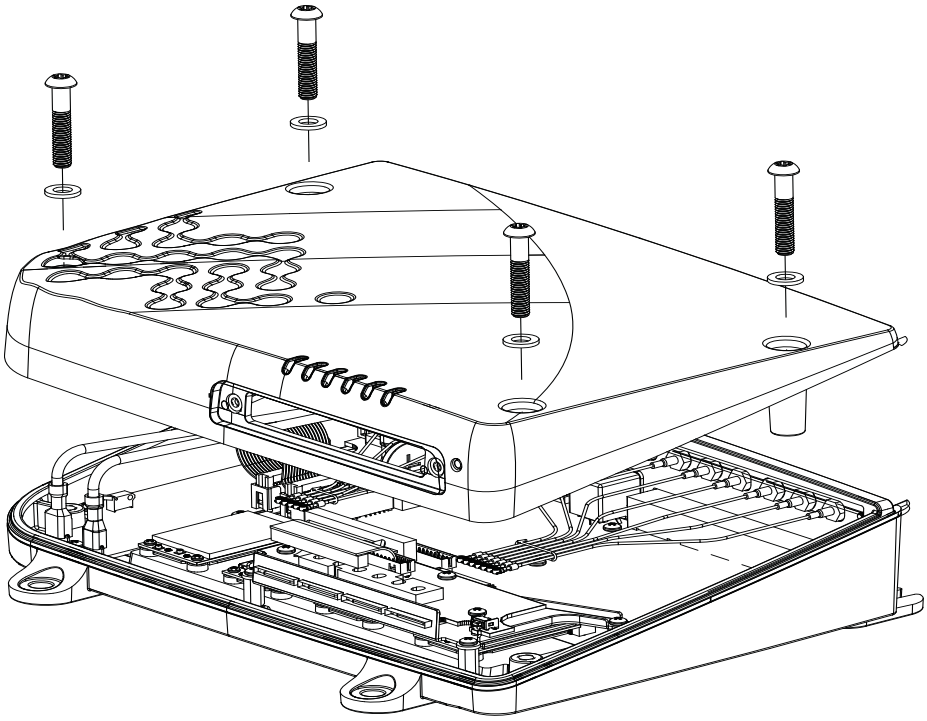


Figure 7: Reattaching the top enclosure

10. Attach the FCC/IC label, shown in Figure 8, to the bottom of the unit. This label identifies the new radio module and maintains the FCC compliance.

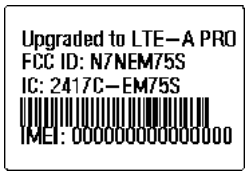


Figure 8: FCC/IC label

11. Insert the SIM card for your FirstNet-compatible service into SIM slot B2.
12. Reconnect data cables to the MG90.

Note: Do not connect power to the MG90 yet. Power is reconnected during the software upgrade procedure described in the link below.

Upgrading the MG90 Software

You can upgrade the MG90 software from a USB image, or using the AirLink Mobility Manager (AMM).

Note: If the MG90 has communicated with the AMM previously, ensure that you use the AMM to configure the MG90 to have the latest software packages (specifically 4.2.0 or later) before upgrading the MG90 with a USB image. To transfer the latest software packages to the AMM, use the Admin > Software > Repository menu. See Using AirLink Mobility Manager on page 8. For more information, the AMM Operation and Configuration Guide on the Source.

Installing MG90 AirLink USB Images

For complete upgrade instructions and USB image downloads, see Installing AirLink USB Images on the Source.

Required hardware/software:

- Disk imaging application (e.g. Win32 Disk Imager)
- USB 2.0 flash drive

Note: 4 GB and 8 GB drives have been tested; other drive sizes are not guaranteed to work. USB 3.0 drives are not currently supported for this process.

Note: This procedure describes the process for Windows systems using Win32 Disk Imager, but the general steps can be applied to other configurations.

To obtain and install an AirLink software image on the MG90 from a USB 2.0 flash drive:

1. Download and install a disk imaging application (such as Win32 Disk Imager for Windows systems) from the Internet.
2. Download the USB image to be installed on the MG90 from https://source.sierrawireless.com/resources/airlink/software_downloads/airlink-mg-usb-images/.
3. Copy the USB image to a flash drive:
   a. Insert a USB 2.0 4GB or 8GB flash drive into your computer.

   Warning: *The flash drive will be overwritten by this procedure.*

   b. Run Win32 Disk Imager.
   c. From the Device drop-down list, select the USB flash drive.
   d. Click the folder icon to navigate to the USB image you downloaded to the computer.
   e. Display all files in the folder (type "*.*" and press **Enter**), then select the USB image and click **Write**.
   f. When prompted to continue, make sure the Target Device is the flash drive and click **Yes** to continue (or **No** to go back and change the Device).
   g. When the "Write Successful" message appears, click **OK**.

h. Click **Exit** to close Win32 Disk Imager.

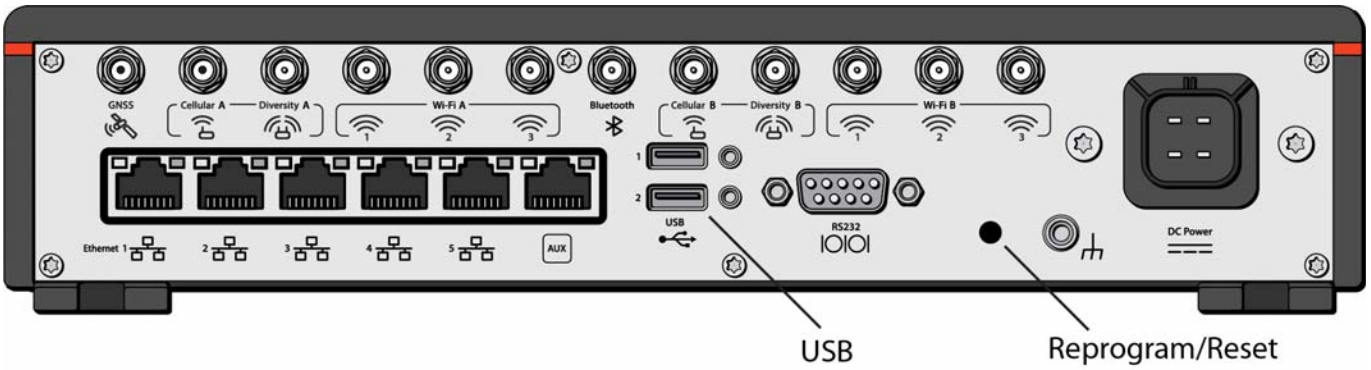
i. Safely eject the flash drive—select the 'safe eject' icon in the task or system tray and wait until notified to remove the drive.

j. Remove the flash drive from the computer.

Important: *Do not open the flash drive on a computer after writing the image, otherwise the MG90 may not be able to read the image file. (Some applications could alter or damage the file.)*

4. Install the USB image on the MG90:

a. Insert the USB flash drive into either USB port in the center of the back panel.



b. Press and hold the Reprogram/Reset button (you should feel or hear it click).

c. While still pressing Reprogram/Reset, apply power to the MG90 (e.g. reconnect the power cable) and wait until the Power LED begins to blink green.

d. Release the button and wait while the MG90 installs the image—the LEDs indicate its progress:

- Power LED blinks green, turns steady green, and then all the LEDs show a yellow or blue 'chase' (each LED blinks in sequence).
- When the chase stops and the Power LED remains steady green, the image is finished loading.

Note: If the chase pattern does not occur, disconnect power and restart the installation.

e. When the image is finished loading (steady green Power LED), remove the flash drive and then remove power from the MG90.

Warning: *Do not remove the power until the image has loaded, otherwise the flash drive or the MG90's hard drive could be corrupted and you will have to start over from step 3.*

f. Reconnect power to the MG90.

The upgraded USB image is now running on the MG90.

Using AirLink Mobility Manager

Ensure that the MG90 is powered, communicating with the AMM, and operating with an existing SIM (not the FirstNet-ready SIM required with the EM7511) before you use the AMM to update MG90 software.

Before beginning, check AMM for new software packages. This involves using the Admin > Software > Distribution screen, which allows you to update gateways with downloaded software packages.

Software Distribution Screen

The *Software Distribution* screen allows administrators to push downloaded software packages to selected gateways. This is the second step of the two-step process for obtaining software packages and distributing those packages to gateways.

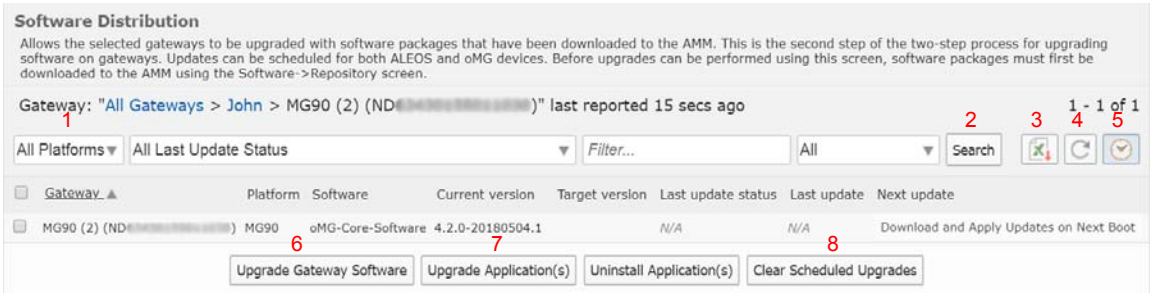


Figure 9: Software Distribution Screen

Figure 9 shows the main features of the Software Distribution screen:

1. **Filter Fields**: filters the list by device type, last status, name, and date/time range.
2. **Search**: executes the filter.
3. **Export to CSV**: exports the list of software packages to a .CSV file.
4. **Refresh**: refreshes the list of software packages. Used mainly to update software package statuses.
5. **Last Update**: toggles whether the date/time of the last update is to be automatically updated and displayed.
6. **Upgrade Gateway Software**: displays the *Upgrade Gateway Software* wizard to perform firmware upgrades to a selected gateway. If multiple gateways are selected, the wizard will require that a single gateway platform be selected (see Upgrading Gateway Software below).
7. **Clear Scheduled Upgrades**: removes any upgrades which are scheduled to automatically run. Upgrades can be scheduled using the *Upgrade Gateways Software* and *Upgrade Application(s)* wizards.
8. **Schedule Information**: if there is a schedule icon in the *Next update* column and it is clicked, the column can show schedule information.

Note that an application package's date indicates whether it contains the latest build, as opposed to package version numbers which may change for various reasons unrelated to versioning.

The Software Distribution screen compares the build dates of downloaded application packages to determine if they are newer than that installed on the selected gateway. Packages which have a newer date are then made available by the Software Distribution screen for a potential upgrade.

For example, if an application package listed on the Software Distribution screen contains a software package with version 9.48804.v3.sdk4-20160106.1, the AMM will compare its date ("20160106") to that of the package installed on the selected gateway, and make it available as an upgrade if that date is newer than the gateway's installed version.

The software version of a selected gateway can be viewed in the AMM, by clicking on the **Stats** menu and looking for the value of the **SoftwareVersion** stat:

Figure 10: SoftwareVersion Stat

Upgrading Gateway Software

The *Upgrade Gateway Software* wizard is activated using the *Upgrade Gateway Software* button and allows you to apply firmware to a selected gateway.

The *Upgrade to version* dropdown lists the software which is available on the AMM:

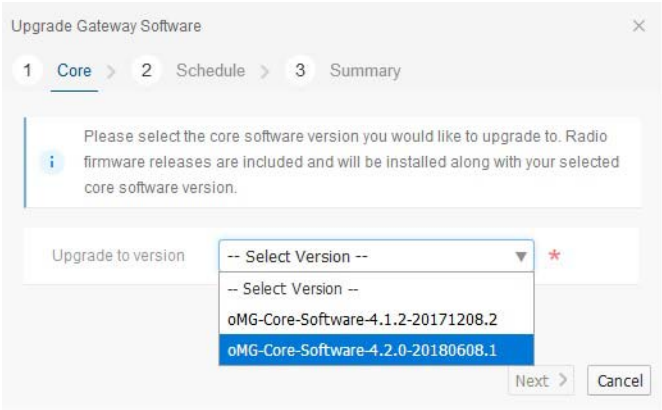


Figure 11: Upgrade Gateway Software Version Selection

Select the version of the software to upgrade to and then click **Next**.

Note: As of AMM 2.16, the wizard allows the software of MG90 devices to be updated from non-FIPS to FIPs, and vice versa.

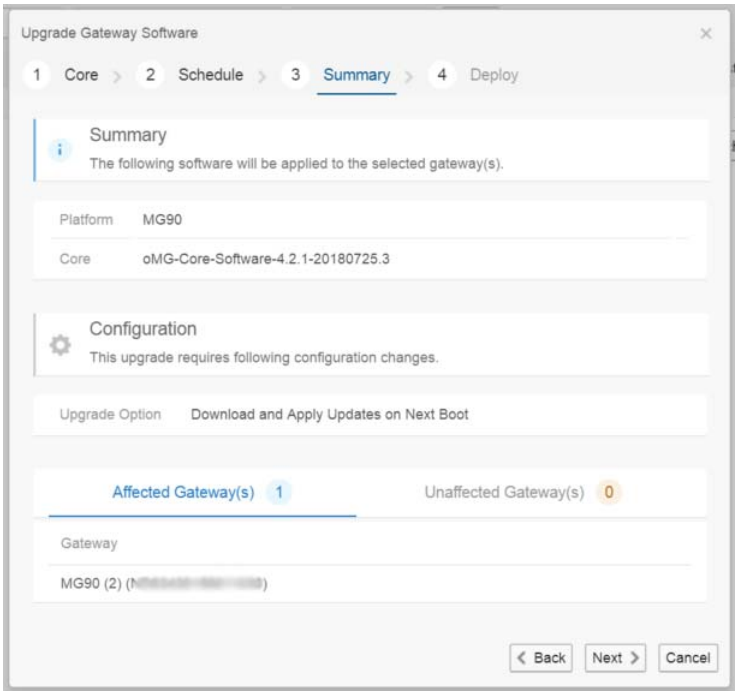


Figure 12: Upgrade Gateway Software Summary

Verify the upgrade information and then click **Next** and **Apply** to start the upgrade process.