Firmware Guide for Cellular Modems in IIoT Products

This guide provides information about the modems used in IIoT products and firmware versions available.

Note   There is a section dedicated to the Firmware Upgrade on the IR807 found at the end of this guide.

Overview

Cisco IoT products use the cellular modems from Sierra Wireless. The architecture of the router is such that there is a dependency between the firmware running on the modem and the version of Cisco IOS running on the router. Sierra Wireless builds a Cisco specific firmware package for the modems embedded in routers based on the firmware that has been certified by the carrier. This firmware that the modem runs on, undergoes a thorough testing in the Cisco lab to ensure a seamless integration and functioning between the modem firmware and Cisco IOS. Once evaluated, the firmware is then posted on the website from where the customers can download it.

Firmware Package Information

Each modem has different firmware available. The following sections list the product, the modem used, and the download site.

IR800 Series Routers

The following table lists the modem and firmware for the classic IR800 series. These devices have modems that plug directly into the unit.

Device or Pluggable Module	Modem	Link to download
IR809 IR829	Wireless WAN MC73XX Interface for Global and Australia.	https://software.cisco.com/download/home/286288632/type/284285628/release/5.5.58.00
IR809 IR829	Wireless WAN MC73XX Interface for North America	https://software.cisco.com/download/home/286288645/type
IR809 IR829	7430 Generic	https://software.cisco.com/download/home/286308413/type

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Device or Pluggable Module	Modem	Link to download
IR829	7430 Australia Telstra	https://software.cisco.com/download/home/286311403/type
IR829	7430 Japan	https://software.cisco.com/download/home/286311416/type
IR829	7455 Generic	https://software.cisco.com/download/home/286308426/type
IR829	7455 Canada	https://software.cisco.com/download/home/286319713/type
IR829	7455 Europe	https://software.cisco.com/download/home/286311468/type
IR829	7455 North American ATT	https://software.cisco.com/download/home/286311442/type
IR829	7455 North American Sprint	https://software.cisco.com/download/home/286311455/type
IR829	7455 North American Verizon	https://software.cisco.com/download/home/286311429/type
IR829	7455 North American US Cellular	https://software.cisco.com/download/home/286323725/type

Pluggable Modules

The following table lists the modem and firmware for the pluggable modules that are used in the newer generation of routers.

Device or Pluggable Module	Modem	Link to download
Device or Pluggable Module	Modem	Link to download
P-LTEA-LA	EM7430 Wireless WAN 7430 Cellular Interface	https://software.cisco.com/download/home/286308413/type
P-LTEA-EA	EM7455 Wireless WAN 7455 Cellular Interface	https://software.cisco.com/download/home/286308426/type
P-LTE-VZ	WP7601-G Wireless WAN WP7601 Cellular Interface for North America Verizon	https://software.cisco.com/download/home/286322139/type

Device or Pluggable Module	Modem	Link to download
P-LTE-US	WP7603-G Wireless WAN WP7603 Cellular Interface for North America ATT	https://software.cisco.com/download/home/286322143/type
P-LTE-JN	WP7605-G Wireless WAN WP7605 Cellular Interface for Japan	https://software.cisco.com/download/home/286322156/type
P-LTE-GB	WP7607-G Wireless WAN WP7607 Cellular Interface for Europe	https://software.cisco.com/download/home/286322147/type
P-LTE-IN	WP7608-G Wireless WAN WP7608 Cellular Interface for India and Asia	https://software.cisco.com/download/home/286322152/type
P-LTE-MNA	WP7610-G Wireless WAN WP7610 Cellular Interface for North America	https://software.cisco.com/download/home/286324942/type
P-LTEAP18-GL	LM960A18 Wireless WAN LM960 Cellular Interface for Global Carriers	https://software.cisco.com/download/home/286324996/type/284285628/release/32.00.1x7

Firmware Upgrade on the IR807

This section provides information about upgrading Cisco cellular modem firmware on the IR807. To make sure that the modem's firmware and other settings are upgraded correctly, certain packages needs to be downloaded and upgraded on the modem. It is important to identify the modem and SKU type and follow the corresponding sequence.

Unlike other routers, there are three file types that will be upgraded on the WP75xx and WP76xx modems:

- Modem firmware with carrier PRI which is a .spk file

- Modem Legato and Yacto firmware file which is a .spk file

- Modem OEM PRI file which is a .nvu file

Refer to the following table for the SKU, Modem Type, and Firmware.

Firmware Upgrade Procedure

> **Note** The following examples illustrates how to perform an upgrade. You will need to perform the same steps with each modem file (*.spk and *.nvu) to complete the firmware upgrade.

SKU ID	Modem Type	Firmware
IR807G-LTE-VZ-K9	WP7601	https://software.cisco.com/download/home/286322139/type
IR807G-LTE-NA-K9	WP7504	https://software.cisco.com/download/home/286320624/type
IR807G-LTE-GA-K9	WP7502	https://software.cisco.com/download/home/286320597/type

The following rules apply when upgrading modems:

- Each of the files need to be upgraded separately. You cannot place them together in the same folder and perform a simultaneous upgrade.
- When switching from one carrier to another, only the Firmware file corresponding to the carrier needs to be upgraded. You do not need to re-upgrade with the OEM PRI and Legato-Yocto files. For example: If using an IR807G-LTE-NA-K9 with the ATT SIM in one slot and Sprint SIM in the other slot, simply upgrade with the firmware corresponding to the active SIM.

Perform the following steps to upgrade the modem firmware:

Step 1 Go to the Cisco web page to download the latest certified firmware for your carrier by going to the following location: https://software.cisco.com/download/home/286288566

Step 2 Create a directory in flash to host the firmware, which will be downloaded in step 3.

```
IR807# mkdir flash
Create directory filename [flash]? <enter>
Created dir flash:/flash
```

Step 3 Download the firmware to the directory in the router flash. This can be done by hosting the firmware on an FTP or TFTP server, and connecting to that server via any WAN interface on the router. Below is a example showing the modem firmware downloaded onto the router flash over the FastEthernet interface:

> **Note** Output edited for brevity.

```
IR807# copy tftp flash
Address or name of remote host []? 192.168.1.1
Source filename []? /<directory>/WP75xx_07.12.09.00_Legato_Yacto_MCU.spk
Destination filename [WP75xx_07.12.09.00_Legato_Yacto_MCU.spk]?<enter>
/<directory>/ WP75xx_07.12.09.00_Legato_Yacto_MCU.spk
Accessing tftp://192.168.1.1//<directory>/WP75xx_07.12.09.00_Legato_Yacto_MCU.spk...
Loading /<directory>/WP75xx_07.12.09.00_Legato_Yacto_MCU.spk from 192.168.1.1 (via
FastEthernet0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

```
[OK - 24444106 bytes]
24444106 bytes copied in 132.368 secs
```

Step 4 Verify that the firmware is available on the newly created directory inside router flash by using the following command:

```
IR807# dir flash:WP75xx_07.12.09.00_Legato_Yacto_MCU
Directory of flash:/WP75xx_07.12.09.00_Legato_Yacto_MCU/
-rw- 24444106 Sep 4 2017 09:58:34 -08:00 WP75xx_07.12.09.00_Legato_Yacto_MCU.spk
```

Step 5 Initiate a modem firmware upgrade using the microcode reload command.

Example: Firmware upgrade of WP7504 modem with a .spk file

```
IR807#microcode reload cellular 0 0 modem-provision
flash:WP7504_07.12.09.00_00_SPRINT_001.020_000.spk
IR807#Reload microcode? [confirm]<enter>
Log status of firmware download in router flash system?[confirm]<enter>
Firmware download status will be logged in flash:/fwlogfile
Could not create Log file.
flash: may not be installed or maybe full. Continue?[confirm]
Microcode Reload Process launched for Cellular 29246280; hw type = 0x6F3
Router#
*******************************************************
 The interface will be Shut Down for Firmware Upgrade
 This will terminate any active data connections.
*******************************************************
*******************************************************
 Modem will be upgraded!
 Upgrade process will take up to 15 minutes. During
 this time the modem will be unusable.
 Please do not remove power or reload the router during
 the upgrade process.
*******************************************************
*Aug 29 00:44:35.005: %LINK-5-CHANGED: Interface Cellular0, changed state to
administratively down
*Aug 29 00:44:35.009: %LINK-5-CHANGED: Interface Cellular1, changed state to
administratively down
 Sending F/W[WP75xx_07.12.09.00_00_SPRINT_001.020_000.spk] to the card [24590760
bytes]:
Firmware file: WP75xx_07.12.09.00_00_SPRINT_001.020_000.spk sent to the card

Modem Device ID: WP7504  MODEM F/W Boot Version: SWI9X15Y_07.12.09.00 r34123
CARMD-EV-FRMWR1 2017/04/26 23:34:19
Modem F/W App Version: SWI9X15Y_07.12.09.00 r34123 CARMD-EV-FRMWR1 2017/04/26 23:34:19
Modem SKU ID: 1103235
Modem Package Identifier: 1103235_9906722_WP7504_07.12.09.00_00_Cisco_001.001_000
Modem Carrier String: 4
Modem PRI Ver: 01.01     Modem Carrier Name: ATT
Modem Carrier Revision: 001.028_000


Firmware Upgrade is in Progress...
*Aug 29 00:45:19.305: %CISCO800-2-MODEM_DOWN: Cellular0 modem is now DOWN.
FIRMWARE INFO AFTER UPGRADE:
F/W Upgrade: Firmware Upgrade has Completed Successfully
*Aug 29 00:48:41.001: %CISCO800-2-MODEM_UP: Cellular0 modem is now UP
*Aug 29 00:49:41.205: %CELLWAN-2-MODEM_RADIO: Cellular0 Modem radio has been turned on
*Aug 2
```

Example: Legato Firmware Upgrade of WP7504 with a .spk File

```
IR807#microcode reload cellular 0 0 modem-provision flash:Release-14-Yocto-Legato-MCU.spk
IR807#Reload microcode? [confirm]<enter>
Log status of firmware download in router flash system?[confirm]<enter>
Firmware download status will be logged in flash:/fwlogfile
Could not create Log file.
flash: may not be intilled or maybe full. Continue?[confirm]
Microcode Reload Process launched for Cellular 29246280; hw type = 0x6F3
Router#
****************************************
 The interface will be Shut Down for Firmware Upgrade
 This will terminate any active data connections.
*****************************************************
Router#
*****************************************************
 Modem will be upgraded!
 Upgrade process will take up to 15 minutes. During
 this time the modem will be unusable.
 Please do not remove power or reload the router during
 the upgrade process.
*****************************************************
*Aug 29 01:10:56.217: %LINK-5-CHANGED: Interface Cellular0, changed state to
administratively down
*Aug 29 01:10:56.217: %LINK-5-CHANGED: Interface Cellular1, changed state to
administratively down
 Sending F/W[Release-14-Yocto-Legato-MCU.spk] to the card [32221981 bytes]:
Firmware file: Release-14-Yocto-Legato-MCU.spk sent to the card

Modem Device ID: WP7504  MODEM F/W Boot Version: SWI9X15Y_07.12.09.00 r34123
CARMD-EV-FRMWR1 2017/04/26 23:34:19
Modem F/W App Version: SWI9X15Y_07.12.09.00 r34123 CARMD-EV-FRMWR1 2017/04/26 23:34:19
Modem SKU ID: 1103235
Modem Package Identifier: 1103235_9906722_WP7504_07.12.09.00_00_Cisco_001.001_000
Modem Carrier String: 11
Modem PRI Ver: 01.01     Modem Carrier Name: SPRINT
Modem Carrier Revision: 001.020_000


Firmware Upgrade is in Progress...
*Aug 29 01:11:54.597: %CISCO800-2-MODEM_DOWN: Cellular0 modem is now DOWN.
FIRMWARE INFO AFTER UPGRADE:
F/W Upgrade: Firmware Upgrade has Completed Successfully
*Aug 29 01:13:47.584: %CISCO800-2-MODEM_UP: Cellular0 modem is now UP
```

Example: Upgrade of (OEM) PRI (.NVU) file

```
Router# microcode reload cellular  0 0 modem-provision
flash:WP7504_1103235_07.12.09.00_00_Cisco_001.001_000.nvu
Reload microcode? [confirm]<enter>
Log status of firmware download in router flash system?[confirm]<enter>
Firmware download status will be logged in flash:/fwlogfile
Could not create Log file.
flash: may not be installed or maybe full. Continue?[confirm]
Microcode Reload Process launched for Cellular 29246280; hw type = 0x6F3
Router#
```

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```
*******************************************************
 The interface will be Shut Down for Firmware Upgrade
 This will terminate any active data connections.
*******************************************************
*******************************************************
 Modem will be upgraded!
 Upgrade process will take up to 15 minutes. During
 this time the modem will be unusable.
 Please do not remove power or reload the router during
 the upgrade process.
*******************************************************
 Sending F/W[WP7504_1103235_07.12.09.00_00_Cisco_001.001_000.nvu] to the card [31081
bytes]:
Firmware file: WP7504_1103235_07.12.09.00_00_Cisco_001.001_000.nvu sent to the card

*Aug 29 01:22:32.544: %LINK-5-CHANGED: Interface Cellular0, changed state to
administratively down
*Aug 29 01:22:32.544: %LINK-5-CHANGED: Interface Cellular1, changed state to
administratively down
Modem Device ID: WP7504  MODEM F/W Boot Version: SWI9X15Y_07.12.09.00 r34123
CARMD-EV-FRMWR1 2017/04/26 23:34:19
Modem F/W App Version: SWI9X15Y_07.12.09.00 r34123 CARMD-EV-FRMWR1 2017/04/26 23:34:19
Modem SKU ID: 1103235
Modem Package Identifier: 1103235_9906722_WP7504_07.12.09.00_00_Cisco_001.001_000
Modem Carrier String: 11
Modem PRI Ver: 01.01      Modem Carrier Name: SPRINT
Modem Carrier Revision: 001.020_000


Firmware Upgrade is in Progress...
*Aug 29 01:23:11.352: %CISCO800-2-MODEM_DOWN: Cellular0 modem is now DOWN.
FIRMWARE INFO AFTER UPGRADE:
F/W Upgrade: Firmware Upgrade has Completed Successfully
Router#
```