



# Release Notes

Release 16.01.2

## **Important Notice**

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless modem are used in a normal manner with a well-constructed network, the Sierra Wireless modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless modem, or for failure of the Sierra Wireless modem to transmit or receive such data.

## **Safety and Hazards**

Do not operate the Sierra Wireless modem in areas where cellular modems are not advised without proper device certifications. These areas include environments where cellular radio can interfere such as explosive atmospheres, medical equipment, or any other equipment which may be susceptible to any form of radio interference. The Sierra Wireless modem can transmit signals that could interfere with this equipment. Do not operate the Sierra Wireless modem in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, the Sierra Wireless modem **MUST BE POWERED OFF**. When operating, the Sierra Wireless modem can transmit signals that could interfere with various onboard systems.

The driver or operator of any vehicle should not operate the Sierra Wireless modem while in control of a vehicle. Doing so will detract from the driver or operator's control and operation of that vehicle. In some states and provinces, operating such communications devices while in control of a vehicle is an offence.

## **Limitations of Liability**

This manual is provided "as is". Sierra Wireless makes no warranties of any kind, either expressed or implied, including any implied warranties of merchantability, fitness for a particular purpose, or noninfringement. The recipient of the manual shall endorse all risks arising from its use.

The information in this manual is subject to change without notice and does not represent a commitment on the part of Sierra Wireless. SIERRA WIRELESS AND ITS AFFILIATES SPECIFICALLY DISCLAIM LIABILITY FOR ANY AND ALL DIRECT, INDIRECT, SPECIAL, GENERAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE OR ANTICIPATED PROFITS OR REVENUE ARISING OUT OF THE USE OR INABILITY TO USE ANY SIERRA WIRELESS PRODUCT, EVEN IF SIERRA WIRELESS AND/OR ITS AFFILIATES HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR THEY ARE FORESEEABLE OR FOR CLAIMS BY ANY THIRD PARTY.

Notwithstanding the foregoing, in no event shall Sierra Wireless and/or its affiliates aggregate liability arising under or in connection with the Sierra Wireless product, regardless of the number of events, occurrences, or claims giving rise to liability, be in excess of the price paid by the purchaser for the Sierra Wireless product.

Customer understands that Sierra Wireless is not providing cellular or GPS (including A-GPS) services. These services are provided by a third party and should be purchased directly by the Customer.

**SPECIFIC DISCLAIMERS OF LIABILITY:** CUSTOMER RECOGNIZES AND ACKNOWLEDGES SIERRA WIRELESS IS NOT RESPONSIBLE FOR AND SHALL NOT BE HELD LIABLE FOR ANY DEFECT OR DEFICIENCY OF ANY KIND OF CELLULAR OR GPS (INCLUDING A-GPS) SERVICES.

## **Patents**

This product may contain technology developed by or for Sierra Wireless Inc.

This product includes technology licensed from QUALCOMM®.

This product is manufactured or sold by Sierra Wireless Inc. or its affiliates under one or more patents licensed from InterDigital Group and MMP Portfolio Licensing.

## Copyright

© 2016 Sierra Wireless. All rights reserved.

## Trademarks

Legato™ is a trademark of Sierra Wireless®.

mangOH™ is a trademark of Sierra Wireless®.

Sierra Wireless®, AirPrime®, AirLink®, AirVantage®, WISMO® and the Sierra Wireless and Open AT logos are registered trademarks of Sierra Wireless, Inc. or one of its subsidiaries.

Watcher® is a registered trademark of Netgear, Inc., used under license.

Windows® and Windows Vista® are registered trademarks of Microsoft Corporation.

Macintosh® and Mac OS X® are registered trademarks of Apple Inc., registered in the U.S. and other countries.

QUALCOMM® is a registered trademark of QUALCOMM Incorporated. Used under license.

Other trademarks are the property of their respective owners.

## DOCUMENT HISTORY

| Version    | Date              | Description         |
|------------|-------------------|---------------------|
| 15.10.Beta | November 13, 2015 | initial PDF version |
| 16.01.2    | February 19, 2016 | 16.01.2 version     |
|            |                   |                     |

## Contents

|   |    |
|---|----|
| Welcome to Legato .....                 | 1  |
| Downloads.....                          | 1  |
| Features .....                          | 2  |
| New Features .....                      | 2  |
| Input Power Supply Monitoring API ..... | 2  |
| Secure Storage Admin API .....          | 2  |
| Ultra Low Power Mode API - WP85 .....   | 2  |
| Changed Features.....                   | 3  |
| Application Definition - .adef .....    | 3  |
| Software Update .....                   | 3  |
| System Definition .sdef .....           | 3  |
| Modem Radio API.....                    | 3  |
| Modifications .....                     | 4  |
| Enhancements .....                      | 4  |
| Changes .....                           | 4  |
| Yocto .....                             | 7  |
| meta-swi .....                          | 7  |
| meta-swi extras.....                    | 7  |
| kernel.....                             | 8  |
| kernel-meta.....                        | 8  |
| Known Issues.....                       | 9  |
| Documentation.....                      | 10 |

# WELCOME TO LEGATO

This document provides important information about the Legato Beta 16.01 release.

You may also need to look at:

[Upgrade Legato](#)

[Release Notes](#)

[Legato Documentation](#)

## Downloads

Download legato-af source from [Legato GitHub](#):

These are the Legato 16.01 source packages, available at: [Legato Downloads](#)

### Linux Distribution

Legato-Dist-Source-mdm9x15-SWI9X15Y\_07.08.03.00.tar.bz2

### Toolchain for Linux PC i686 Legato 32 bits:

poky-swi-ext-glibc-i686-meta-toolchain-swi-ext-armv7a-vfp-neon-toolchain-swi-ext-1.7.2.tar.bz2

### Toolchain for Linux PC x86 64bits:

poky-swi-ext-glibc-x86\_64-meta-toolchain-swi-ext-armv7a-vfp-neon-toolchain-swi-ext-1.7.2.tar.bz2WP

### WP Firmware

Available at [WP Firmware Downloads](#)

# FEATURES

Legato 16.01.2 has the following new and changed features.

## New Features

### **Input Power Supply Monitoring API**

Input Power Supply Monitoring API has been added to monitor platform voltage input and support setting warning/critical thresholds.

### **Secure Storage Admin API**

Secure Storage Admin API has been added to provide secure storage administrative control for privileged users.

### **Ultra Low Power Mode API - WP85**

A new API has been added for WP8548 to provide ultra low power mode control. This is an Alpha release; development is in progress.

A Boot Reason Query API was also added to determine the reason for the last OS boot from ultra low power mode.

## Changed Features

### Application Definition - .adef

The application definition .adef file "requires: api:" section and "provides: api:" sections have been replaced by the "extern:" section that can include both client-side and server-side interfaces.

### Software Update

The Software Update API now supports atomic updates, autonomous recovery/roll-back, and reduces flash consumption.

This also affects the host tool instapp syntax, which now needs ".update".

### System Definition .sdef

The System Definition .sdef files have the following new sections:

- apps: now has subsection Preloaded to indicate if an app must be preloaded onto a target separate from the rest of the system. [http://get-legato/legato/merged/latest/doc/user/html/def\\_files\\_sdef.html#defFilesSdef\\_appsPreloaded](http://get-legato/legato/merged/latest/doc/user/html/def_files_sdef.html#defFilesSdef_appsPreloaded)
- new commands: section makes a command-line tool available to the root user logged into a shell on the target tty. [http://get-legato/legato/merged/latest/doc/user/html/def\\_files\\_sdef.html#defFilesSdef\\_commands](http://get-legato/legato/merged/latest/doc/user/html/def_files_sdef.html#defFilesSdef_commands)

### Modem Radio API

The `le_mrc_RegisterCellularNetwork` function has been deleted. `le_mrc_SetManualRegisterMode` should be used instead.

# MODIFICATIONS

The following modifications were completed.

## Enhancements

These features were enhanced:

- [AirVantage] Add capability file for the Legato framework
- [AirVantage] Implement command fields for AV data
- [Audio] Can't hear sound while play analog local record file
- [Audio] Trac for ANO86045
- [C APIs] [mdm9x40] add RTC in cm tool
- [FASTSSH] Adopt the improvements made to shlib in 4958
- [FW Update] report progress indication only when change is >1%
- [GNSS/Positioning] GNSS API should work as a standalone service
- [Make] Fixed different app MD5 from mkapp vs mksys
- [MangOH plug-ins] Allow targetDefs to be extended or overridden
- [Modem] Update LE\_MDC\_INTERFACE\_NAME\_MAX\_LEN
- [Modem] MRC - Add function to get List of supported GSM bands
- [Sandbox] Extend mount option string length
- [Services] Add support for 'file' parameter in HANDLERs
- [Services] Secure Storage cleanup not compatible with system roll-back
- [Services] Do not start avcService and positioningService automatically
- [SIM] Legato SIM PA is changing the QMI CAT mode...
- [Start-up] Bring up ecm with default parameters
- [Start-up] Remove xattr setting on RO fs from startupScript
- [Start-up] remove bindmount /opt in startupScript

## Changes

These changes were completed:

- [AirVantage] clear install started flag after install complete
- [AirVantage] Fixed fetch of assetName in avcStart.sh
- [AirVantage] avcService fixes
- [AirVantage] LE\_AVC\_UNINSTALL\_PENDING Notification don't survive a Power outage
- [AirVantage] Ensure only one AVC control app is running



[AirVantage] apps don't build if added to .sdef

[App Data] Old app data not being cleared on upgrade.

[Apps] App install/remove inconsistency

[Apps-LWM2M] Remove "tools" and "gpioService" from the announced apps

[Audio] Make 2 playbacks in the same time

[Audio] le\_audio\_Connect and returns LE\_FAULT

[Audio] QMI Fix init of audio service

[CDMA] Can't get remote number when incoming call

[Copy] Recursive copy fix when using cp in file\_Copy

[Event Loop] Fixed deadlock in event loop

[Def Files] Fixed wildcard bindings.

[DTMF] key not be detected when touch key on remote side

[eCall] PSAP eCall clear-down should stop the redial after ...

[eCall] Unable to encode the MSD with Bad Vehicle direction

[eCall] - ERA-GLONASS dial duration timer is not started...

[File Permissions] App file permission errors.

[Event Loop] Fixed deadlock in event loop.

[File Names] Rename generated \_local.h files to \_messages.h

[FOTA] Send FOTA error state to user control app

[Make] Remove cmake macro target\_compile\_options

[Make] Change protocol hash calculation generated by ifgen

[Modem] Manual register network returns timeout(use legato API) and error(use AT)

[Modem] UE release connection fixes

[Modem] le\_mrc\_GetServingCellId() doesn't handle LTE cell id info

[Modem] fwupdate query doesn't work if modemService is not working

[Modem] If no PDP context set initially, le\_mdc\_GetProfileFromApn ...

[Modem] modemDaemon has no access to apns-full-conf.json file

[Modem] le\_mdc\_GetDataBearerTechnology failure when connected in IPV6

[MTD3] Impossible to install an app on a new system from mtd3

[Positioning] Heading and Direction parameters are inconsistent

[Sample Apps] Added missing Makefile for sample apps

[Sandbox] devices are not available in sandbox apps

[Sandbox] app writeable files can't be imported to sandbox

[Secure Storage] Can't create item with maximum allowable name length

[Secure Storage] increase system index and restart Legato corrupts meta file

[Services] GPIO service attempts to export GPIO 1

[Services] le\_ecall / SMS fallback case / cannot have voice ...

[Services] voicecall and smsinbox included in build

[Services] le\_voicecall\_RemoveStateHandler() makes the modemService

[Services] secure storage low write performances

[Services] Re-enabled the GPIO service in the build

[Services] Add system info le\_update.api  
[Start-up] Try count is incremented with legato restart  
[Start-up] System installed missing startSystem and fix /mnt/legato image start  
[Start-up] start program jumbles up systems on boot  
[Start-up] Fix error in startupScript / BindMount  
[Start-up] Improve Legato framework startup time  
[Supervisor] "restartApp" fault action doesn't work (after system update/rollback related changes)  
[SMACK] appSmack LABEL\_LEN is too small  
[Supervisor] Fixed race in Supervisor  
[Target Access] configEcm issues  
[Tools] straceCfg missing from target tools  
[Tools][CM]Some ADC values can't be read  
[Tools] setNet generated config invalid if no gateway/no nameserver  
[Update] Trimming wrong system when updating system  
[Update] Newly installed system using the incorrect bin/lib files (instsys)  
[Update] Remove all good systems except the last good one  
[Update] Need to refresh the ld.so.cache when old system directory present  
[Update] Reject app if preinstall hook fails  
[Update] Pre and post install script errors  
[Update] Firmware update via update pack  
[Update] Fallback in 15.12 from 16.01 after installing an application  
[Update] Tried count is double incrementing  
[Update] System Update build changes  
[Update] Current system not deleted when index same as snapshot  
[Update] security-unpack can't use already defined uid gid  
[Update] Fixed a tiny buffer overrun  
[Update] Apps need to be trimmed  
[Update] Fixed 'update' exit code on success.  
[Update] Fix missing legato-image..cwe files  
[VoLTEMO] Legato CallEventHandler not raised during VoLTE MO call  
[WP8548] - Audio file playback fails  
[WP85] Fail cwe generation with a warning if fakeroot version req is not met

## Yocto

These Yocto layer modifications are included:

### meta-swi

- Add kernel-dev package to toolchain
- Detect squashfs volume at run time
- New recipe for performances
- Legato does not install liblegato.so in the good place in sysroots
- Tie legato build dir to version
- Legato does not install .update when build in Yocto
- Make Legato compatible with dash
- Enable the NMEA service
- Add CRDA to rootfs for TI Wireless
- Allow kernel modules auto load at system startup
- TI wlcore ELP timeout
- Provide kernel source dir to lk
- Install kernel modules in rootfs
- Add device tree support
- New recipe for WiFi modules and tools into RootFS
- Removing 2k.yaffs2 from rootfs image gen
- CodeAurora versions update (except lk, alsa-intf)
- Use libhardware from codeaurora
- Update ti-compat-wireless recipe to build on recent ubuntu releases
- Add kernel-dev package to toolchain
- new recipe for performances
- Detect squashfs volume at run time

### meta-swi extras

- Strip binaries in generated source tarball
- Fix compatibility with dash
- new recipe for performances
- Update generate\_version\_file() for meta-swi-extras
- Redirect free output to log file
- Make Legato compatible with dash
- Fix legato repo not provided to build system if LEGATO\_BUILD=false
- Re-enable USB audio
- Make Legato compatible with dash
- Remove package seminole
- Fix compatibility with dash
- Strip binaries in generated source tarball

**kernel**

MCI user app support for MCU firmware update with MCU kernel driver

WP85/75: Increase OS heap for CF3

Remove support for some obsolete products

Prevent invalid I2C addressing via direct device access

Sometimes UART1 about AT service can't work, vt: fix race in vt\_waitactive()

SPI I/O drive strength improperly set

WPx5 MCU kernel driver, phase 1

Kernel does not handle GPIOs external IRQ correctly

Enable device tree support

TI wl18xx wireless driver introduction

**kernel-meta**

WPx5 MCU kernel driver, phase 1

Add USB serial FTDI driver support

Disable early print

Move kernel drivers to modules, enable device tree

TI wl18xx wireless driver introduction

## KNOWN ISSUES

Legato 16.01 has the following known issues:

[Audio] Inband DTMF play failed with USB interface

[Audio] `le_audio_PlaySignallingDtmf` returns an "Unspecified internal error" after called it 944 times

[busybox] 'mdev -s' vs. hotplug events are not generating the same environment

[Debug] log level setting had no effect on logs sent by a process

[Dev Studio] Inconsistent stack when debugging on WP85

[eCall] - ERA-GLONASS dial duration timer is not started on 1st try and redial counter is not reset on connection

[eCall] In only Mode, the UE deregister after clear down when it should wait for T10(12h) to expire

[Framework] event missed from legacy App: `LE_MRC_REG_HOME`

[Framework] Bundled directories are not deployed and app cannot start as a result

[GNSS]`le_gnss_LoadExtendedEphemerisFile` always return `LE_FORMAT_ERROR`

[GNSS] `le_antenna_GetExternalAdc` return `LE_FAULT` when called with the GNSS Antenna.

[GNSS] `le_gnss_PositionHandler` is raised more often than the rate specified using `le_gnss_SetAcquisitionRate`

[GNSS] `le_gnss_GetTtff` always return `LE_BUSY` even after first 3D fix when GNSS mode is standalone

[GNSS] [WP85] `le_antenna_GetStatus` return `LE_FAULT`

[LWM2M] Modem obj9 is not updated properly when obj9 instance is deleted from legato

[Modem] Legato API `le_mrc_RegisterCellularNetwork` unable to connect to the home network

[SIM Toolkit][WP85][eUICC] BIP commands are not processed by legato

[SIM toolkit] [UICC] [BIP] No event raised by legato when a proactive command is pending.

[SIM Toolkit] [AR8652] QMI CAT MODE should not be initialized by Legato at power on

[SMSCB] Cannot receive SMS Cell Broadcast

[Start up] Restarting of syslog by Legato start-up code causes log data to be lost.

# DOCUMENTATION

The documentation has a new look and topics have been reorganized for easier access to key info. Search functionality has also been improved.

The following documentation changes are included in this release:

- [Docs] Add reference to real test code in MDC API documentation
- [Docs] Add reference to real test code in MRC API documentation
- [Docs] Add reference to real test code in SIM API documentation
- [Docs] Add reference to real test code in MCC API documentation
- [Docs] Add reference to real test code in Audio API documentation
- [Docs] Add reference to real test code in SMS API documentation
- [Docs] Add reference to real test code in eCall API documentation
- [Docs] Added info on how to use avsysinfo and avappinfo
- [Docs] Independent Definition Language topics renamed to API Files
- [Docs] Improve function header comments in some generated API functions and ifgen topic edits
- [Docs] Document change on usage of accept install/uninstall
- [Docs] Fixed AirVantage-related docs
- [Docs] remove wp7 references
- [Docs] Add Ultra Low and Boot Query API topics
- [Docs] broken sdef file link fixed
- [Docs] Add Sec Store Admin API topic
- [Docs] Update to new colours and style
- [Docs] Change navigation and colours for new style
- [Docs] Update Services docs
- [Docs] Modify build apps process for new system update pack
- [Docs] Update Build topic make syntax to include .update
- [Docs] Clarified get/set user timebase info
- [Docs] Renamed IDL topics, now API Files, moved to new Learn section
- [Docs] GPIO sample app only CF3
- [Docs] Move uninstall topic
- [Docs] Change instapp syntax, now needs .update
- [Docs] Add How To Use Software Update topic
- [Docs] Add How To Security topic
- [Docs] Add links for 16.01 release and upgrade notes
- [Docs] Add App Dev Quick Start topic
- [Docs] Move sample apps topics to Get Started
- [Doc] eCall update for Automatic and Normal eCall...
- [Docs] - [GNSS documentation issue]