



WP77xx

Customer Release Notes

Release 11

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Document History

Rev XX.YY	Date YYYY/MM/DD	Updates	Author
01.06	2019/05/31	Added WP7702 Verizon Package to Release 11	SL
01.05	2019/05/07	Release 11	SL
01.04	2018/07/27	Release 9.1	SL
01.03	2018/05/25	Release 9	SL
01.02	2018/02/28	Release 8	SL
01.01	2017/12/29	Release 7	SL
01.00	2017/10/23	Creation - Release 6	SL

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1 Introduction

1.1 Scope of this document

This document describes WP77xx firmware releases.

1.2 Audience of this document

These release notes may be distributed to all direct and indirect customers.

2 Abbreviations and definitions

Abbreviation/Acronym	Definitions
AT	Access Terminal, Attention
LK	Little Kernel Linux bootloader
FDT	Firmware Download Tool
LPWA	Low-Power Wide-Area Wireless Technology
MCU	Microcontroller Unit – An onboard MCU enables Ultra Low Power modes of operation
PSM	Power Save Mode
QMI	Qualcomm MSM Interface, Qualcomm Modem Interface
ULPS	Ultra Low Power State

3 Related documentation

Ref. #	Doc. #	Document title
[1]	41111420	AirPrime WP77xx - Product Technical Specification
[2]	4118047	AirPrime WPx5xx/WP76xx/WP77xx - AT Command Reference
[3]	41110380	AirPrime WP Series – Preparing Your Devices For Deployment
[4]	41110866	AirPrime WPx5xx/WP76xx/WP77xx - Scalability Guide
[5]	41110418	AirPrime WP76xx Customer Release Notes

4 Compatibility

Hardware compatibility

Product compatibility list
<p>WP7702</p> <ul style="list-style-type: none"> • <i>LTE Cat-M1; Bands 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 26, 28</i> • <i>LTE CAT-NB1; Bands 1, 2, 3, 4, 5, 8, 12, 13, 17, 18, 19, 20, 26, 28</i> • <i>GSM; Bands GSM 850, E-GSM 900, DCS 1800, PCS 1900</i> <p>WP7700</p> <ul style="list-style-type: none"> • <i>LTE Cat-M1; Bands 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 26, 28</i> • <i>LTE CAT-NB1; Bands 1, 2, 3, 4, 5, 8, 12, 13, 17, 18, 19, 20, 26, 28</i>

5 SWI9X06Y Release 11

Release 11 is a major release for WP77xx that has achieved FOTA, Connectivity Ready, and AV Ready status. This release includes new features and milestones such as Carrier LWM2M, Brazil Anatel IPV6 Regulatory Conformance support, Deutsche Telekom certification, and is the final candidate for Verizon carrier approval. The same carrier and industrial certifications obtained in Release 9.1 still apply. As of writing, Verizon certification has been obtained on WP7702. WP7700 Verizon certification is still pending, and the package will be released once the module has been approved by the carrier.

5.1 Software Release Description

5.1.1 Release identification

Component	Revision
Modem Firmware	SWI9X06Y_02.22.12.00 eaf79c jenkins 2019/04/24 18:48:27
Linux Firmware	SWI9X06Y_02.22.12.00 2019-04-24_20:46:59
MCU Firmware	002.011 (embedded as a binary in the linux image, not distributed as a separate component)
Legato Application Framework	18.09.2_2a5c6ae47c6da6f1483bc7eac5d48fa1
Binary Size	50MB (compressed binaries)
IMEI SV	3
Qualcomm Stack Version	MDM9206.LE.2.0-00149-STD.PROD-1.182748.1
Linux Kernel Version	Linux swi-mdm9x28-wp 3.18.44 #2 PREEMPT Wed Apr 24 20:48:03 UTC 2019 armv7l GNU/Linux
Supported HW	WP7702, WP7700

5.1.2 Software Tools Versions

S/W Tools Name	Version
Windows Driver Package	B4836
Windows SDK	None
Skylight	None
Linux Drivers	S2.35N2.54
Linux SDK	SLQS04.00.17

5.1.3 Released Files and Download Processes

Files	Carrier	Modem Firmware	Config	Linux Distribution	Base Legato System	Comment
WP7702 Approved						
WP77xx_Release 11_TMOBILE.exe	GENERIC (T-Mobile)	SWI9X06Y_02.13.02.00	001.009_001	SWI9X06Y_02.22.12.00	18.09.2	T-Mobile USA Approved
WP77xx_Release 11_GENERIC_GC F.exe	GENERIC (GCF)	SWI9X06Y_02.22.12.00	001.051_000	SWI9X06Y_02.22.12.00	18.09.2	GCF Approved
WP77xx_Release 11_GENERIC_PT CRB.exe	GENERIC (PTCRB)	SWI9X06Y_02.16.06.00	001.028_004	SWI9X06Y_02.22.12.00	18.09.2	PTCRB Approved



Files	Carrier	Modem Firmware	Config	Linux Distribution	Base Legato System	Comment
WP77xx_Release 11_SIERRA.exe	SIERRA	SWI9X06Y_02.22.12.00	001.021_000	SWI9X06Y_02.22.12.00	18.09.2	GCF Approved
WP77xx_Release 11_ATT.exe	ATT	SWI9X06Y_02.16.06.00	001.026_001	SWI9X06Y_02.22.12.00	18.09.2	AT&T Approved
WP77xx_Release 11_DT.exe	GENERIC (Deutsche Telekom)	SWI9X06Y_02.22.02.00	001.041_001	SWI9X06Y_02.22.12.00	18.09.2	Deutsche Telekom Approved
WP77xx_Release 11_VERIZON.exe	VERIZON	SWI9X06Y_02.22.12.00	001.042_000	SWI9X06Y_02.22.12.00	18.09.2	Verizon Approved
WP7700 Approved						
WP77xx_Release 11_GENERIC_GC F.exe	GENERIC (GCF)	SWI9X06Y_02.22.12.00	001.051_000	SWI9X06Y_02.22.12.00	18.09.2	GCF Approved
WP77xx_Release 11_GENERIC_PT CRB.exe	GENERIC (PTCRB)	SWI9X06Y_02.16.06.00	001.028_004	SWI9X06Y_02.22.12.00	18.09.2	PTCRB Approved
WP77xx_Release 11_SIERRA.exe	SIERRA	SWI9X06Y_02.22.12.00	001.021_000	SWI9X06Y_02.22.12.00	18.09.2	GCF Approved
WP77xx_Release 11_ATT.exe	ATT	SWI9X06Y_02.16.06.00	001.026_001	SWI9X06Y_02.22.12.00	18.09.2	AT&T Approved
From: https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-11						

Function	Files
Firmware Components	9999999_9907618_SWI9X06Y_02.13.02.00_00_GENERIC_001.009_001.spk (T-Mobile USA) 9999999_9907618_SWI9X06Y_02.16.06.00_00_GENERIC_001.028_004.spk (PTCRB) 9999999_9907618_SWI9X06Y_02.22.02.00_00_GENERIC_001.041_001.spk (Deutsche Telekom) 9999999_9907618_SWI9X06Y_02.22.12.00_00_GENERIC_001.051_000.spk (GCF) 9999999_9908788_SWI9X06Y_02.22.12.00_00_SIERRA_001.021_000.spk 9999999_9907787_SWI9X06Y_02.16.06.00_00_ATT_001.026_001.spk 9999999_9908088_SWI9X06Y_02.22.12.00_00_VERIZON_001.042_000.spk linux-SWI9X06Y_02.22.12.00.cwe legato-18.09.2.cwe
From: https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-11	

5.1.4 Available Memory

Flash:

NAME	PARTITION	ALLOCATION (KB)	IMGSIZE (KB)	USAGE
LK boot	mtdd12 (boot)	14336	8957	62%
Linux Kernel	mtdd13 (system)	29952	19456	64%
Legato Framework	mtdd14 (lefwkro)	8704	4609	53%
SWIRW	mtdd15 (swirw)	24576		
USERAPP	mtdd16 (userapp)	133120		

RAM:

110912 kB^{[1][2]}

- [1] Value is read from the MemAvailable parameter in /proc/meminfo
- [2] Values are for reference only and will vary depending on what services/processes are running at the time of measurement

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5.2 Software Changes Description

The WP77xx Release 11 is based on modem and Linux versions SWI9X06Y_02.22.10.00. This release is functionally equivalent to WP76xx Release 11, with notable changes and features listed below.

ID	Title	Description	Impacted Domain
Legato			
Various	Legato 18.09.1	Legato 18.09.2: <ul style="list-style-type: none"> https://docs.legato.io/18_09/releaseNotes18090.html https://docs.legato.io/18_09/releaseNotes18080.html https://docs.legato.io/18_09/releaseNotes18070.html Upgrade from 18.06.1 in Release 9.1. Includes: <ul style="list-style-type: none"> LE-10931 - Neighbouring cell info API is returning cell info only for serving cell in case of UMTS and LTE mode LE-10514 - Package download is not launched when no application register to AV events. User agreement has been disabled by default in this release LE-12343 - Fix for FOTA download failure in poor network conditions LE-12162 - Suspend package download when curl retry fails 	Legato AF
ECHO-710 LE-12343 LE-12162	FOTA Interruption	If FOTA was interrupted for a lengthy duration, such as cases when there was limited network coverage, the download would abort and need to be restarted (rather than resumed). This has been fixed in Legato 18.09.1.	FOTA
Linux Distribution			
QT19X07-2317 QT19X07-2446 QT19X07-2553	Upgrade Linux Distro to LXSWI2.2-10.0, based on Yocto 2.2.2	Upgrade to LXSWI2.2-10.0 Includes: <ul style="list-style-type: none"> Enabling QCA9377 WiFi driver Kernel security fixes Smack onlycap capable. 	Linux baseline
QT19X07-2404	Incremental build of yocto cannot boot up	When built incrementally, the result yocto.cwe was not bootable due to roothash out of sync. Solution is to add nostamp=1 to force install task of iniframfs-mdmunit recipe	Build
QT19X07-2197 QT19X07-2273	Crash when AT port URC on USB during selective suspend	A crash was observed intermittently when using AT over USB and the apps processor came out of sleep to generate a URC (e.g. +CNMI message on incoming SMS).	Kernel
QT19X06-164	Wake-able GPIOs are not working as wakeup interrupt in USB-SS mode	When the device is in USB Selective Suspend mode, the GPIOs that can be configured as wake up interrupts were unable to wake the device from sleep state. This issue has been fixed in this release. GPIO36 and GPIO38 are exceptions and still do not work properly, see QT19X06-167.	GPIO
LPM			

ID	Title	Description	Impacted Domain
QT19X07-2488	Set default PSM synchronization option to use MCU RTC Alarm as the PSM wakeup source	Change the default PSM/ULPM synchronization option in the driver to use the MCU RTC Alarm as the PSM wakeup source for minimal current consumption during PSM.	PSM/ULPM
QT19X07-2551	PSM does not work	In Sierra-customized PSM power off sequence, "poweroff" command is used for graceful Linux system shutdown after MPSS shuts down. The script for "poweroff" command will synchronize with MPSS to start power-down. In case of the customized PSM power off sequence, MPSS may have shut down at the point of "poweroff" command is issued, causing a fatal error detected by BAM DMUX kernel driver and then recovered with a system-restart. This patch adds a Boolean flag to prevent the BAM DMUX kernel driver from restarting system, knowing that MPSS may have been shut down at this point. The added flag is set only during the customized PSM power off sequence. It has no impact on regular "poweroff" command.	PSM/ULPM
QT19X06-141	AT!POWERMODE and boot_source/enable doesn't take effect for PSM or ULPM fallback	This fixes the issue where PSM cannot be enabled or disabled by Legato or AT!POWERMODE	PSM/ULPM
QT19X06-152	ULPM fallback does not work consistently	When PSM with ULPM fallback is attempted, if PSM is not available, ULPM shall be used to enter ULPS. However this fallback to ULPM was not working consistently. This has been fixed in Release 11.	PSM/ULPM
Modem			
Core			
QT19X06-12 QT19X06-29 QT19X06-68 QT19X06-116	Multiple Qualcomm updates to: MDM9206.LE.2.0-00149-STD.PROD-1.182748.1	Add Qualcomm baseline MDM9206.LE.2.0-00149-STD.PROD-1.182748.1. Includes: <ul style="list-style-type: none"> ECHO-702: Verizon Signalling Test case 2.11 failure CERTREQ-819: [AT&T] - Qualcomm CR Update: July 2018 QT19X06-3: Anatel IPV6 CRs ECHO-700: Fix for modem crash assertion fails in dlccch.c due to pdsch_semaphore_value 	Qualcomm baseline
Protocol/Certification			
QT19X06-3	Corner case failures in RFC2460 IPV6 compliance tests	WP77 was not compliant with some corner case requirements in RFC2460 for IPV6 protocol testing. These issues have been fixed in this release, with the exception of test case v6LC_1_2_01 in GSM.	Data
QT19X06-18	Increase IMEI SV to 3	The IMEI SV has been increased to 3 in this release.	IMEI SV
QT19X07-2364	Update TS.25 list to October 01, 2018	Default TS.25 list updated. Non-GSMA PLMNs removed except Test PLMNs.	GCF

ID	Title	Description	Impacted Domain
Various	Verizon Carrier LWM2M Support	<p>The full support for Carrier LWM2M has been added in this Release. The Carrier LWM2M client is only enabled for the Verizon carrier image and is a mandatory requirement to obtain Verizon certification. It is disabled by default for all other carriers.</p> <p>Notable features include:</p> <ul style="list-style-type: none"> • Runtime credential provisioning from SIM • SMS wakeup • Registration update and recovery • Server object 1 • Device Management object 3 • Connectivity Monitoring object 4 • Connectivity Statistics object 7 • Observation and Notification <p>Although WP77xx Release 11 is feature complete for Carrier LWM2M, WP76xx Release 11 only contains partial functionality and does not meet Verizon's OTADM requirements.</p>	Carrier LWM2M
UIM			
QT19X07-698 QT19X07-2041 QT19X07-2112	Auto SIM switching, v.1	<p>A feature has been added in advance of embedded SIM module deployments that allows configuration of a preferred SIM such that upon boot, if both external SIM and embedded SIM are present, the preferred one will be selected. See AT!CUSTOM="UIMAUTOSWITCH" in the WP AT Command Guide.</p> <p>Changes in SIM detect status at run time do not trigger SIM reselection. This is being considered in a future release.</p>	eSIM
QT19X07-1705 QT19X07-2215 QT19X07-2241	Unable to support SIM hot swap on external SIM2 slot	Fixed the issue that SIM in external multiplexed slot 2 does not work when removing SIM in primary slot 1	SIM
QT19X06-120	Crash in dog.c: Watchdog detects task starvation of 839ce864	Early access of some slow SIM cards that takes more than 10s to initialize will cause a crash due to watchdog timeout. The blocking calls have been removed in the code to prevent this.	Stability
IO			
QT19X07-2030	External GPIO config is not persistent for image switches	In previous releases, any firmware update or image switch would clear all configuration in AT+WIOCFG. Now, when upgrading to Release 11 and future releases, this configuration will persist. That is, modules running Release 9 or earlier will retain their configuration when upgrading to Release 11.	GPIO
QT19X07-1410 QT19X07-2124 QT19X07-2131	Embedded linux assigned GPIO initialization on boot	<p>In Release 7, issues with embedded linux assigned GPIOs (e.g. QT19X07-959, QT19X07-1121) were addressed by re-initializing them late in modem startup. This, however, introduced a potential timing issue with linux if an attempt to set them early in linux boot occurred before the final modem initialization.</p> <p>These are now initialized in the boot loader to ensure no such timing conflict occurs.</p>	GPIO, Linux

ID	Title	Description	Impacted Domain
QT19X07-1770	Add GPIO4 support	For WP75/85 GPIO4 (CF3 pin 65) is hardcoded for use as UIM2 detect line. For WP76/77, however, UIM2 is reserved for embedded SIM and therefore not needed for this purpose. It has therefore been exposed as a GPIO. This is supported via AT+WIOCFG and sys/class/gpio as with other GPIOs, but will only be available on new units shipped with Release 11 or later. Future use for SIM2 detection in conjunction with AT+KSIMSEL is under consideration (QT19X07-1705).	GPIO
QT19X06-22	Issues with Band Selection output pins on GSM	In previous firmware releases, the mapping of the GSM active band to the 3GPP band number is incorrect, so the wrong bands might be shown as active. Also, the pins are not activated during TX period on GSM bands. This has been fixed.	GPIO
Security			
QT19X07-1997	Security: move DM disable to Level 2 via AT!USBCOMP	As the DM port poses a security risk, the ability to configure it is lock level 3. However, if it happens to be enabled, it is important for security purposes to be able to close it, so disable is moved to lock level 2.	Boot
QT19X07-1875	No limit to secure storage	Previously there was no limit imposed on SFS so once consumed would impact internal features unexpectedly, such as AGPS. This change imposes a 512KB limit on customer SFS content. The limit is not configurable. If that limit has already been exceeded prior this firmware update it must be reduced prior to updating SFS.	SFS
QT19X07-2160	Reduce AT!SECBOOTCFG? to a level 2 lock	Secure boot devices have limited debug capability unless loaded with a debug image built specifically for that module. Such debug images can only be built by Sierra and may require information provided by AT!SECBOOTCFG? so this query command has been reduced to lock level 2 for field support.	Secure boot
QT19X07-3238 OEMPRI-11148	[Secure Boot] Increase safe update signature buffer	In previous WP77xx releases, enabling Customer Secure Boot (OEM Authentication) will cause the device to unable to boot up due to an issue in processing the keystore file. Customers who wish to enable Customer Secure Boot must upgrade their firmware to Release 11 or later prior to downloading the keystore file. All the carrier packages in Release 11 have been repackaged with the new bootloader to fix this issue.	Customer Secure boot
Data			
OEMPRI-8614 OEMPRI-8464	APN in CGDCONT changed after a FOTA	Due to the current design, a manually updated APN profile in the Generic PRI with embedded Sierra PRI would be reverted to the Sierra default if a Sierra SIM was detected. To ensure APN persistence across FW updates / image switches a separate SIERRA carrier PRI was created. Both Generic and Sierra images must be loaded to have separate APN profiles for both.	Carrier PRI



ID	Title	Description	Impacted Domain
OEMPRI-9073 OEMPRI-9225 OEMPRI-11103	Update Generic and Sierra PRI so SELRAT and SELCIOT is persistent	Due to the initial long network scan time on LTE NB1, some users choose to disable NB1 mode for a quicker acquisition time. This setting was reset after a FW upgrade, so the device would fail to re-attach to the network immediately after a FOTA download. Change was made to make the LTE mode selection and RAT preference persistent so NB1 scanning won't be triggered again after the FOTA.	Carrier PRI
OEMPRI-11071	Update Sierra APN to lp.swir	Default APN for users using the Sierra PRI has been changed to "lp.swir".	Carrier PRI
QT19X06-20	SLQSAutoConnect() or SetAutoconnect() always returns error code 1071	Support for the SLQS auto-connect related APIs were previously disabled on the chipset by Qualcomm. This has since been enabled.	QMI
AT Commands			
QT19X06-69	LTE ACQ DB EFS file format is handled incorrectly in ACQCHAN command	The AT!ACQCHAN command output was previously unable to show the LTE channels due to a file parsing error. This has been fixed.	AT
Factory/Configuration			
QT19X06-72	NVTHIST does not survive a firmware update	The file to record device configuration history was previously only backed up at the Sierra factory. This has since been changed so that customers can make persistent changes to this file to track their own additional configuration history to the device.	NV

5.3 Security Corrections/Improvements

CVE	Description
CVE-2018-5916	Information Exposure in MODEM
CVE-2018-11268	Improper Validation of Array Index in Storage
CVE-2018-11267	Improper Validation of Array Index in Core
CVE-2018-5866	Untrusted Pointer Dereference in TrustZone
CVE-2018-5914	Improper Validation of Array Index in TZ CORE
CVE-2018-5915	Reachable Assertion in MODEM IP Stack
CVE-2018-11966	Improper Input Validation in MMCP
CVE-2018-11945	Buffer Copy Without Checking Size of Input in MMCP
CVE-2018-11938	Buffer Copy Without Checking Size of Input in Trusted Application Environment
CVE-2018-11289	Buffer Copy Without Checking Size of Input in Core
CVE-2018-5913	Cryptographic Issues in TrustZone
CVE-2018-11820	Cryptographic Issues in Ecosystem
CVE-2018-13886	Integer Overflow to Buffer Overflow in MODEM
CVE-2018-13887	Integer Overflow or Wraparound in MODEM
CVE-2018-13903	Null Pointer Dereference in Modem
CVE-2018-13923	Use of Initialized Data in MODEM
CVE-2018-11968	Integer Overflow or Wraparound in WLAN

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CVE	Description
CVE-2018-5897	Buffer over-read while reading data from buffer in dci_process_ctrl_status()
CVE-2018-5896	Possibility of out-of-bound read because of not validating source buffer length
CVE-2018-5864	Improper Restriction of Operations within the Bounds of a Memory Buffer in WLAN
CVE-2018-11266	Improper Input Validation in DIAG
CVE-2018-11265	Buffer Copy Without Checking Size of Input in Core
CVE-2018-5919	Use After Free in WLAN
CVE-2018-11953	Buffer Over-read in WLAN
CVE-2018-11885	Reachable Assertion in WLAN
CVE-2017-1000158	CPython (aka Python) up to 2.7.13 is vulnerable to an integer overflow in the PyString_DecodeEscape function in stringobject.c, resulting in heap-based buffer overflow
CVE-2018-1000030	Python 2.7.14 is vulnerable to a Heap-Buffer-Overflow as well as a Heap-Use-After-Free.
CVE-2016-10255	The __libelf_set_rawdata_wlock function in elf_getdata.c in elfutils before 0.168 allows remote attackers to cause a denial of service (crash) via a crafted (1) sh_off or (2) sh_size ELF header value, which triggers a memory allocation failure.
CVE-2016-10254	The allocate_elf function in common.h in elfutils before 0.168 allows remote attackers to cause a denial of service (crash) via a crafted ELF file, which triggers a memory allocation failure.
CVE-2018-1000120	A buffer overflow exists in curl 7.12.3 to and including curl 7.58.0 in the FTP URL handling that allows an attacker to cause a denial of service or worse.
CVE-2018-1000122	A buffer over-read exists in curl 7.20.0 to and including curl 7.58.0 in the RTSP+RTP handling code that allows an attacker to cause a denial of service or information leakage
CVE-2018-1000121	A NULL pointer dereference exists in curl 7.21.0 to and including curl 7.58.0 in the LDAP code that allows an attacker to cause a denial of service
CVE-2017-5601	An error in the lha_read_file_header_1() function (archive_read_support_format_lha.c) in libarchive 3.2.2 allows remote attackers to trigger an out-of-bounds read memory access and subsequently cause a crash via a specially crafted archive.
CVE-2016-10350	The archive_read_format_cab_read_header function in archive_read_support_format_cab.c in libarchive 3.2.2 allows remote attackers to cause a denial of service (heap-based buffer over-read and application crash) via a crafted file.
CVE-2016-10349	The archive_le32dec function in archive_endian.h in libarchive 3.2.2 allows remote attackers to cause a denial of service (heap-based buffer over-read and application crash) via a crafted file.
CVE-2018-6485	An integer overflow in the implementation of the posix_memalign in memalign functions in the GNU C Library (aka glibc or libc6) 2.26 and earlier could cause these functions to return a pointer to a heap area that is too small, potentially leading to heap corruption.
CVE-2017-15804	The glob function in glob.c in the GNU C Library (aka glibc or libc6) before 2.27 contains a buffer overflow during unescaping of user names with the ~ operator.
CVE-2018-1000001	In glibc 2.26 and earlier there is confusion in the usage of getcwd() by realpath() which can be used to write before the destination buffer leading to a buffer underflow and potential code execution.
CVE-2017-12133	Use-after-free vulnerability in the clntudp_call function in sunrpc/clnt_udp.c in the GNU C Library (aka glibc or libc6) before 2.26 allows remote attackers to have unspecified impact via vectors related to error path.
CVE-2017-15107	A vulnerability was found in the implementation of DNSSEC in Dnsmasq up to and including 2.78. Wildcard synthesized NSEC records could be improperly interpreted to prove the non-existence of hostnames that actually exist.
CVE-2018-7738	In util-linux before 2.32-rc1, bash-completion/umount allows local users to gain privileges by embedding shell commands in a mountpoint name, which is mishandled during a umount command (within Bash) by a different user, as demonstrated by logging in as root and entering umount followed by a tab character for autocompletion.

CVE	Description
CVE-2017-12424	In shadow before 4.5, the newusers tool could be made to manipulate internal data structures in ways unintended by the authors. Malformed input may lead to crashes (with a buffer overflow or other memory corruption) or other unspecified behaviors. This crosses a privilege boundary in, for example, certain web-hosting environments in which a Control Panel allows an unprivileged user account to create subaccounts.
CVE-2018-0739	Constructed ASN.1 types with a recursive definition (such as can be found in PKCS7) could eventually exceed the stack given malicious input with excessive recursion. This could result in a Denial Of Service attack. There are no such structures used within SSL/TLS that come from untrusted sources so this is considered safe. Fixed in OpenSSL 1.1.0h (Affected 1.1.0-1.1.0g). Fixed in OpenSSL 1.0.2o (Affected 1.0.2b-1.0.2n).
CVE-2017-16544	In the add_match function in libbb/lineedit.c in BusyBox through 1.27.2, the tab autocomplete feature of the shell, used to get a list of filenames in a directory, does not sanitize filenames and results in executing any escape sequence in the terminal. This could potentially result in code execution, arbitrary file writes, or other attacks.

5.4 Known Issues

This section presents all known issues in this release.

ID	Title	Description	Impacted Domain
Bugs			
ECHO-712 LE-11902	AVMS Heartbeat doesn't work for periods >= 4 hr	<p>On some networks including the Sierra Wireless Core network, the network will detach the device after a period of inactivity. Legato currently cannot handle such a scenario and therefore polling will commonly fail on those networks if it is set to longer than 4 hours.</p> <p>This issue does not affect customers who are using PSM on their devices.</p> <p>Customers who do not use PSM and are not power sensitive are advised to configure their polling timer to a period shorter than 4 hours.</p> <p>This issue will be fixed in the Legato 19.02 release. For the Sierra Wireless core network, this is expected to be resolved in the future where the timeout will be extended significantly on LPWA APNs.</p>	FOTA
ECHO-708 LE-12462	[VERIZON] Synchronization failed on attempt to retrieve data object of IMSI (lwm2m.10241.0.2)	Legato is unable to read the IMSI from some SIM cards that contain a CSIM application which is listed first, such as some of Verizon's SIM cards. This in turn will cause synchronization failures with the Airvantage server. Expectation is this will be resolved in a future Legato release.	Connectivity

ID	Title	Description	Impacted Domain
ECHO-757 ECHO-770	Unable to resume a FOTA download after failure in the middle of a previous download process	The Legato 18.09 release does not support resuming a FOTA job if it fails in the middle of a package download. If a FOTA download fails due to events including, but not limited to, device reset, power loss, or AirVantage connection problems, the download will appear to resume but will end up failing. When this happens, the FOTA job must be restarted (rather than resumed). This has been fixed in the Legato 19.02 release.	FOTA
QT19X06-33	Connectivity Interruption	In lab testing, a scenario has been occasionally observed where connectivity is interrupted every three minutes when using the Sierra Wireless SIM. This issue has not been seen in field testing. A corrective plan is currently ongoing, get in touch with your Sierra Wireless representative for latest update	Connectivity
QT19X07-2696	Modem Daemon crashes when le_mdc_GetDisconnectionReason function has been called	Modem daemon in Linux will crash when querying the disconnection reason from Legato. The recovery after the crash is automatic and there should be no impact to customers.	Legato
QT19X07-2535	Unable to build Yocto image with QCA9377_BUILD enabled	Unable to build with QCA9377 wifi driver enabled.	Yocto
QT19X07-2387	After starting the data session - AUTHENTICATION <LE_MDC_AUTH_CHAP LE_MDC_AUTH_PAP> ENABLED, the profile returned is incorrect	With Legato, fail to establish a data session with authentication enabled	Legato
ECHO-672	RFC 2460 Compliance test case v6LC_1_2_01 failure	The device is currently failing test case v6LC_1_2_01 for IPV6 RFC 2460 compliance due to failure to send a Parameter Problem message during the test.	Data
QT19X06-167	Interrupts for wake-able GPIOs 36 and 38 must be re-enabled	For wake-able GPIOs 36 and 38, the interrupt can be only be detected once after a USB suspend/resume cycle. Workaround is to explicitly re-enable the interrupt (as done in the gpioCf3SSDemo sample app). This issue exists in Release 9.1 as well.	GPIO
QT19X07-2327	Can't attach Bluetooth controller to UART2	User currently cannot attach the Bluetooth controller to UART2, but it works on UART1. Issue is due to lack of high speed UART configuration setting in the device tree for UART2, that currently only uses low speed 2-wire configuration.	UART/Console
QT19X07-2303	Cannot input characters to UART2 while the module is in sleep mode	UART2 mapped as linux console cannot input character when the module is in sleep.	UART/Console
QT19X07-2272	Periodic high current draw when testing EDRX/DRX with HSIC Enabled	Periodic high current draw is seen when testing EDRX/DRX with HSIC Enabled. Every 3.5 mins, there will be a period of 1.5 mins where the device will wake up and consume around 35mA of current.	System

ID	Title	Description	Impacted Domain
QT19X07-2245	Missing libxml during incremental build	Incremental build will fail when building Yocto, the customer will need to clean & rebuild for every Yocto change. A temporary workaround is to backup and restore libxml.la for avoiding a clean build.	Build
QT19X07-2195	SNTP Client unable to use existing connection	Unlike the WPx5, the WP76/77 SNTP client must open a new connection, which is more visible and could have undesirable consequences. Therefore for WP76 the feature is off by default so the user would need to enable it explicitly to get the benefit. This can be done via QMI/Legato, but because it is a AT!CUSTOM feature, a level 2 password is required to enable it via AT	FOTA/Other
QT19X07-2186	Setting identical profile AUTH params forces LTE re-attach with SINGLEAPNSWITCH	With SINGLEAPNSWITCH feature enabled, Legato cm data connect always fails on LTE with Legato 18.05.1 or older	Legato
QT19X07-2076	No Legato Event after an OPEN CHANNEL	No Legato event is reported for STK BIP Open Channel proactive command	Legato
QT19X07-1928	The eth0 address is erased when Wifi chip is inserted after reboot	eth0 address is erased when Wifi chip is inserted after reboot	Driver
QT19X07-1494	Legato - boot loop error when build with 70MB Database	Boot loop error when build Legato image with 70MB Database	Legato
QT19X07-2474	Current can only reach around 15 mA when it supposes to go to sleep	Modules fail to enter sleep mode after SIM card being unlocked and then synchronizing to the network.	Sleep
QT19X07-3315	AT!CUSTOM BANDSELEN not persistent over FW upgrades	The setting of AT!CUSTOM="BANDSELEN",1 to enable Antenna Select feature will not stay persistent across a firmware upgrade. Customers who are using this customization will need to either manually enable it again, or request to have persistence added for this setting in their OEM PRI to avoid this issue.	NV

6 SWI9X06Y Release 9.1

Release 9.1 is a point release based off Release 9 that is certified for PTCRB and GCF on WP7700 and WP7702. This is also the AT&T final carrier approval candidate. The Linux and Legato images packaged in this release is the same as WP76xx and WP77xx Release 10.



6.1 Software Release Description

6.1.1 Release identification

Component	Revision
Modem Firmware	SWI9X06Y_02.16.06.00 7605a6 jenkins 2018/06/20 17:56:12
Linux Firmware	SWI9X06Y_02.18.05.00 2018-07-20_21:00:21
MCU Firmware	002.009 (embedded as a binary in the linux image, not distributed as a separate component)
Legato Application Framework	18.06.1_7bc924287cc41a0157bd414af840e754
Binary Size	50MB (compressed binaries)
IMEI SV	2
Qualcomm Stack Version	MDM9206.LE.2.0-00122-STD.PROD-1.153866.1.155657
Linux Kernel Version	Linux swi-mdm9x28-wp 3.18.44 #2 PREEMPT Fri Jul 20 21:01:16 UTC 2018 armv7l GNU/Linux
Supported H/W	WP7702, WP7700

6.1.2 Software Tools Versions

S/W Tools Name	Version
Windows Driver Package	B4836
Windows SDK	None
Skylight	None
Linux Drivers	S2.33N2.52
Linux SDK	SLQS04.00.15

6.1.3 Released Files and Download Processes

Files	Carrier	Modem Firmware	Config	Linux Distribution	Base Legato System	Comment
WP7702 Approved/Pending						
WP77xx_Release 9.1_TMOBILE.exe	GENERIC (T-Mobile)	SWI9X06Y_02.13.02.00	001.009_000	SWI9X06Y_02.18.05.00	18.06.1	T-Mobile Approved
WP77xx_Release 9.1_PTCRB_GCF.exe	GENERIC (PTCRB, GCF)	SWI9X06Y_02.16.06.00	001.028_001	SWI9X06Y_02.18.05.00	18.06.1	GCF and PTCRB Approved
WP77xx_Release 9.1_ATT_test.exe	ATT	SWI9X06Y_02.16.06.00	001.026_000	SWI9X06Y_02.18.05.00	18.06.1	AT&T Approval - Pending
WP7700 Approved/Pending						
WP77xx_Release 9.1_PTCRB_GCF.exe	GENERIC (PTCRB, GCF)	SWI9X06Y_02.16.06.00	001.028_001	SWI9X06Y_02.18.05.00	18.06.1	GCF and PTCRB Approved
WP77xx_Release 9.1_ATT_test.exe	ATT	SWI9X06Y_02.16.06.00	001.026_000	SWI9X06Y_02.18.05.00	18.06.1	AT&T Approval - Pending
From: https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-9.1						

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Function	Files
Firmware Components	9999999_9907618_SWI9X06Y_02.13.02.00_00_GENERIC_001.009_000.spk (T-Mobile) 9999999_9907618_SWI9X06Y_02.16.06.00_00_GENERIC_001.028_001.spk (PTCRB, GCF) 9999999_9907787_SWI9X06Y_02.16.06.00_00_ATT_001.026_000.spk linux-SWI9X06Y_02.18.05.00.cwe legato-18.06.1.cwe
From: https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-9.1	

6.2 Software Changes Description

The WP77xx Release 9.1 is based on modem version SWI9X06Y_02.16.06.00 and Linux version SWI9X06Y_02.18.05.00. Notable changes and features are listed below.

ID	Title	Description	Impacted Domain
Legato			
Various	Legato 18.06.1	Legato 18.06.1 <ul style="list-style-type: none"> https://docs.legato.io/latest/releaseNotes18061.html https://docs.legato.io/latest/releaseNotes18051.html https://docs.legato.io/latest/releaseNotes18040.html Upgrade from 18.03.0 in Release 9. Includes: <ul style="list-style-type: none"> LE-10549/LE-10671: Secure storage corrupted after package update LE-10462: QMI indication for AVMS binary update session does not set correct binary type 	Legato AF
Linux Distribution			
QT19X07-1885 QT19X07-2036	Move MCU firmware default location	Previously, the MCU image was stored in the USERRW partition. It has now been moved to ROOTFS. This provides the benefit of freeing USERRW for the end user and ensuring that the correct MCU image is paired with the corresponding linux kernel driver instead of being distributed/packaged independently.	MCU file management
QT19X07-2089 QT19X07-2104 QT19X07-2142	Unable to build from tarball	The externally posted linux source distribution (tarball) failed to build. This has been corrected.	Build
QT19X07-2002	Legato Toolchain Versioning	Instead of always using the default location /opt/swi/y22-ext, the toolchain is now installed in a version specific location, e.g. /opt/swi/SWI9X06Y_02.18.05.00	Build
QT19X07-2053 QT19X07-2177	Upgrade Linux Distro to LXSWI2.2-7.0, based on Yocto 2.2.2	Upgrade to LXSWI2.2-7.0 (from LXSWI2.2-4.0 in Release 9)	Linux Baseline
QT19X07-2197 QT19X07-2273	Crash when AT port URC on USB during selective suspend	A crash was observed intermittently when using AT over USB and the apps processor came out of sleep to generate a URC (e.g. +CNMI message on incoming SMS).	Kernel

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ID	Title	Description	Impacted Domain
QT19X07-2217	Module cannot resume sleep after ending a voice call if no codec on host platform	In the case where no codec is installed on the host platform, after a voice call has ended the module could not go back to sleep mode. This has been fixed in the linux kernel alsa driver.	Kernel
QT19X07-1862	Boot up time optimization: load modem image after partition mounted	By starting modem loading earlier, as soon as the image partition is mounted, the system boot time can be reduced by ~1.5 seconds	Boot
Modem			
Core			
QT19X07-2163	Add Qualcomm MDM9206.LE.2.0-00122.1.153866.1.155657	Add Qualcomm baseline MDM9206.LE.2.0-00122.1.153866.1.155657. Includes: <ul style="list-style-type: none"> • QT19X07-1818: [36.523-1][22.3.2.2][NB-IOT] AM RLC TC failure • QT19X07-1821: [36.523-1][22.4.8][NB-IOT] RRC conn establishment/Access barring • QT19X07-1498: [36.523-1][7.1.2.4] Step2 SS Unexpected Receive L1 indication at port SYSIND 	Qualcomm baseline
IO			
QT19X07-2030	External GPIO config is not persistent for image switches	In previous releases, any firmware update or image switch would clear all configuration in AT+WIOCFG. Now, when upgrading to Release 9.1 and future releases, this configuration will persist. That is, modules running Release 9 or earlier will retain their configuration when upgrading to Release 9.1.	GPIO
QT19X07-1410 QT19X07-2124 QT19X07-2131	Embedded linux assigned GPIO initialization on boot	In Release 7, issues with embedded linux assigned GPIOs (e.g. QT19X07-959, QT19X07-1121) were addressed by reinitializing them late in modem startup. This, however, introduced a potential timing issue with linux if an attempt to set them early in linux boot occurred before the final modem initialization. These are now initialized in the boot loader to ensure no such timing conflict occurs.	GPIO, Linux
UART			
QT19X07-2136	Modem reset when using UART1	A bug in the CTS interrupt handler was causing a reset when using UART1 in some cases. This has been fixed in the kernel.	UART
Temperature			
QT19X07-2054	Modules in airplane mode crash at high temperature	At high ambient temperatures (> 70C) in airplane mode (not necessarily due to thermal mitigation) some modules would reset due to DDR instability at low frequency (<48MHz). A fix was added to block low DDR frequency selection at high temperatures.	High Temp
Low Power Modes			

ID	Title	Description	Impacted Domain
QT19X07-1709	persist ULPS wakeup triggers	In the original ULPS implementation where wake up triggers would be set before every ULPS request there was no need to persist this configuration. With the harmonization with PSM, however, re-entry to the ultra low power state is automatic (with any explicit command from the user) and hence persistence of wakeup triggers across cycles is necessary. They will now continue to remain in effect until explicitly cleared.	PSM/ULPS
QT19X07-2017	Add command to clear all ULPS wake up sources	Wake up sources are persisted across PSM/ULPS cycles unless explicitly cleared. To simplify this operation support has been added to clear all sources in a single command via AT command or sysfs: a) AT!POWERWAKE=0 b) echo 7 > /sys/module/swimcu_pm/boot_source/clear Note that while documentation of previous releases stated that AT!POWERWAKE=0 would clear all sources, it in fact only cleared the ADC. This has now been fixed.	PSM/ULPS
QT19X07-1678 QT19X07-2035	PSM status code	The addition of PSM support introduces additional complexity with network interaction. To get better insight into the current status, and in particular reasons why a PSM request was rejected, a status code is made available via sysfs: /sys/module/swimcu/psm/status	PSM
QT19X07-1955	Add extended PSM configuration support	Some extended PSM features were previously not configurable or persistent. The only such feature currently used in WP77 is early wake up time. With this change, the early wakeup time is now increased to ensure the TAU timer is not missed.	PSM

6.3 Known Issues

This section presents all known issues in this release.

ID	Title	Description	Impacted Domain
Bugs			
QT19X07-1653 QT19X07-2156	Instability at low temperature	Intermittent instability issues have been observed at low temperature (below -20C), including loss of sync in sleep mode, and UART not working on boot. Test results to date have been inconclusive. Investigation is ongoing.	Connectivity
QT19X07-2159	Anatel IPv6 failure	WP is not in compliance with latest Anatel (Brazil regulatory) IPv6 requirements	Wireless Network

ID	Title	Description	Impacted Domain
QT19X07-1764	New MAC Address generated on each power cycle	By default, the WP will generate a new MAC address on the ethernet interface on every boot. This may be fixed by preconfiguring a MAC address in /etc/network/interfaces	Wired Network
QT19X07-2300	UART1 cannot suspend after RX wakeup	Normally while idle, the UART will suspend to save power, however currently, after first waking up on RX data, it will no longer automatically suspend, incurring an extra ~12mA.	UART
QT19X07-2185 QT19X07-2223 QT19X07-2242	PSM lowest power mode Issues	The PSM lowest power mode option was added in Release 9 to achieve ~7uA. Subsequent testing has found this mode has issues with missing TAU complete message and time of day continuity across PSM cycles. While these issues will continue to be worked for a future release (linux update) the previous default option (consuming ~16uA) has been restored.	PSM
LXSWIREF-684	Patching kernel using recipe linux-quick does not work anymore	Patching the Yocto kernel by using a .bbappend with SRC_URI in recipe linux-quick does not work. The linux image builds, but will not boot on the target. This was introduced in Release 9. A workaround is available upon request from Sierra support. It will be fixed in the next release.	Build
QT19X07-1308	Missing Java dependency for building LK bootloader	The Android Signing tools for the LK bootloader require Java Runtime Environment (JRE) to be installed on the host platform. JRE has not been added to the build environment, so must be installed on the build machine manually. Example, for Ubuntu 16.04: sudo apt-get install default-jre <i>Manual JRE installation will continue to be required going forward.</i>	Build
QT19X07-2102	Workaround issues in GPIO control from linux	Different versions of a workaround were provided to allow linux control of GPIOs with carrier certified modem images. With the issue now addressed in the new carrier certified modem version the workaround is not required, however for workarounds using AT+WIOCFG=<gpio>,0 to enable linux access, these will need to be changed back to AT+WIOCFG=<gpio>,16 going forward. The setting will subsequently be persistent across upgrades so this would be a one time action when upgrading to Release 9.1	GPIO



ID	Title	Description	Impacted Domain
QT19X07-1007	PCM configuration not allowed by default	The ability to set a profile to use a particular interface is controlled by AT!AVPIFACEPREF (level 2 access). By default, PCM was not included so PCM could not be set with AT!AVCFG without first setting AT!AVPIFACEPREF=F. The factory default has been updated to make PCM available by default, however this will only benefit newly manufactured units so AT!AVPIFACEPREF=F is still required.	Audio
QT19X07-1494	Legato - boot loop error when built with large database	Customer legato.cwe image must be small enough to fit into the LEFWKRO partition (8MB).	Legato
QT19X07-1278	Accessing MCU causes I2C NACK error	Any time the MCU is accessed (for version info, GPIO read/write, etc) from a MCU low power state, the first access is needed to wake it up. The retry is automatic and succeeds, but a kernel error is generated on the first attempt. This can be annoying as it floods the kernel log.	Kernel
ECHO-621	WP7702 crashes after issuing AT!DASBAND	During FTM testing, the device will crash when selecting the band under test using AT!DASBAND. Investigation is ongoing with Qualcomm. As a workaround, allow the device to crash once (resets once). Upon the reset, the AT!DASBAND command will not crash the second time around.	FTM
ECHO-594	spidev1.0 does not show up on WP77XX	The spidev kernel module is not loaded on wp77xx Legato targets. As a result, users will not be able to use the SPI service to read and write from the SPI bus. This will be fixed in Legato 18.08.	SPI

7 SWI9X06Y Release 9

Release 9 includes a number of new features including PDN data multiplexing, QMI support for some existing features, PSM current consumption enhancements as well as several bug fixes. This release is intended as a PTCRB and AT&T final certification candidate to resolve several issues for carrier and industrial certification testing. It is important to note that:

- No GCF and PTCRB certification has been granted yet.
- AirVantage and FOTA is now supported

7.1 Software Release Description

7.1.1 Release identification

Component	Revision
Modem Firmware	SWI9X06Y_02.16.04.00 019853 jenkins 2018/05/15 19:28:37
Linux Firmware	SWI9X06Y_02.16.02.00 2018-05-02_12:35:16

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Component	Revision
MCU Firmware	002.009
Legato Application Framework	18.03.0_8c7b8ac619d8a7402ad0dc6f42ba6daf
Binary Size	50MB (compressed binaries)
IMEI SV	2
Qualcomm Stack Version	MDM9206.LE.2.0-00122-STD.PROD-1.149002.1
Linux Kernel Version	Linux swi-mdm9x28 3.18.44 #2 PREEMPT Wed May 2 12:36:47 UTC 2018 armv7l GNU/Linux
Supported HW	WP7702 DV1.1+ WP7700 DV 2.1+

7.1.2 Software Tools Versions

S/W Tools Name	Version
Windows Driver Package	B4773
Windows SDK	None
Skylight	None
Linux Drivers	S2.31N2.50
Linux SDK	SLQS04.00.14

7.1.3 Released Files and Download Processes

Function	Files	Carrier	Modem Firmware	MCU Firmware	Linux Distribution	Base Legato System
WP7702 Approved						
Windows one-click firmware upgrade tool	WP77xx_Release_9_TMOBILE.exe	GENERIC (T-Mobile)	SWI9X06Y_02.13.02.00	002.009	SWI9X06Y_02.16.02.00	18.03.0
Test						
Windows one-click firmware upgrade tool	WP77xx_Release_9_GENERIC.exe	GENERIC	SWI9X06Y_02.16.04.00	002.009	SWI9X06Y_02.16.02.00	18.03.0
	WP77xx_Release_9_ATT.exe	ATT	SWI9X06Y_02.16.04.00	002.009	SWI9X06Y_02.16.02.00	18.03.0
	WP77xx_Release_9_VERIZON.exe	VERIZON	SWI9X06Y_02.16.04.00	002.009	SWI9X06Y_02.16.02.00	18.03.0
	WP77xx_Release_9_TELSTRA.exe	TELSTRA	SWI9X06Y_02.16.04.00	002.009	SWI9X06Y_02.16.02.00	18.03.0
From: https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-9						

Function	Files
Firmware Components	9999999_9907618_SWI9X06Y_02.13.02.00_00_GENERIC_001.009_000.spk (T-Mobile) 9999999_9907618_SWI9X06Y_02.16.04.00_00_GENERIC_001.021_000.spk (GCF) 9999999_9907787_SWI9X06Y_02.16.04.00_00_ATT_001.019_000.spk 9999999_9908088_SWI9X06Y_02.16.04.00_00_VERIZON_001.009_000.spk 9999999_9908397_SWI9X06Y_02.16.04.00_00_TELSTRA_001.004_000.spk linux-SWI9X06Y_02.16.02.00.cwe legato-18.03.0.cwe mcufw_002.009_wp77_f1.cwe
From: https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-9	

Template #:	4124005	Revision:	01.06
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7.2 Software Changes Description

The WP77xx Release 9, based on modem version SWI9X06Y_02.16.04.00, is functionally equivalent to WP76xx Release 9 [5], with notable differences and features below.

ID	Title	Description	Impacted Domain
Legato			
Various	Legato 18.03.0	Legato 18.03.0 http://legato.io/legato-docs/latest/releaseNotes18030.html http://legato.io/legato-docs/latest/releaseNotes18020.html Upgrade from 18.01.0 in Release 8	Legato AF
Modem			
Core			
QT19X07-2016	Add Qualcomm MDM9206.LE.2.0-00122-STD.PROD-1.149002.1	Adds Qualcomm baseline MDM9206.LE.2.0-00122-STD.PROD-1.149002.1	Qualcomm baseline (Release 9)
System			
QT19X07-1813	WP77 crash during download package using X-modem	When attempting to perform XMODEM firmware download firmware over the modem USB AT port or the UART port, the device will crash every time. This feature is now fixed and supported.	Firmware Update
AT commands			
QT19X07-1984	[WP77] SELMODE returns wrong setting	When selecting system mode via AT!SELMODE, the setting is not written into the device non-volatile memory and unable to persist across power cycles.	AT/SD
QT19X07-1697	AT!BAND? returns Unknown Band	The device band mask will become shown as "Unknown" if the device changes between different RATs.	AT/SD
QMI			
QT19X07-1460	QMI_NAS_GET_CELL_LOCATION_INFO_REQ_MSG_V01 return error	Legato application and AVMS server was unable to retrieve the device's current cell location ID via QMI because the feature to report modem data statistics was disabled on this chipset. This feature has now been enabled, and the QMI command is working as expected to report the cell location ID.	QMI/NAS
Data			
QT19X07-2015	[WP77] SWI Proxy not working	The feature to set Data Bridge Mode was disabled on the 9x06 chipset by default, causing the modem and Legato application to unable to share a data connection. This feature has been enabled and PDN data multiplexing is now supported.	Data Connectivity
QT19X07-1917	[WP77] Re-enable TLS 1.2 in SO Task	Originally, the mdm9x06 chipset only supported TLS 1.1 for secure sockets. Now that TLS 1.2 support is added, this change will update the device to use TLS 1.2 by default.	Security
RF			

ID	Title	Description	Impacted Domain
QT19X07-1779	GSM Multislot Class BLER Failure	High BLER is observed on GSM low bands when using multiple slots on the downlink. The ASM switching timing was increased in the RF Driver to resolve this issue.	RF/Driver
QT19X07-1948	[WP77] Update Default LTE Power Backoff RF NVs	LTE B2, B5, B12, B13, B26 power backoff NVs were updated to pass FCC certification.	RF/Cal
Network Access			
QT19X07-1852	[WP7702][36.523-1][22.3.2.1][NB-IOT] AM RLC	NB-IOT UE RLC sets the poll bit in all RLC PDUs, which is not expected for GCF testing, but done to provide better data rate. The poll bit should not be set for all RLC PDU, instead it should only be set for the ones configured by the network.	NAS/Protocol
Config			
QT19X07-1955	Add NV psm_config_ext to EFSCconfig XML and persistence list	The PSM sleep duration was adjusted to compensate for the device's boot-up time for better timing accuracy when performing the TAU with the network on wake up.	PSM
QT19X07-1236	[WP7702][AT&T][LTE-CM1-4-6907] - CAT M - MO SMS wakes UE from PSM	The device was a few seconds delayed in performing the TAU with the network after waking up from PSM due to long boot up time. This was fixed by adjusting the PSM sleep duration to compensate for the boot up time.	PSM
QT19X07-1249	[WP7702][AT&T][LTE-CM1-4-6908] - CAT M - MO DATA wakes UE from PSM	The device was a few seconds delayed in performing the TAU with the network after waking up from PSM due to long boot up time. This was fixed by adjusting the PSM sleep duration to compensate for the boot up time.	PSM

7.3 Known Issues

This section presents all known issues in this release.

ID	Title	Description	Impacted Domain
Bugs			
QT19X07-1308	Missing Java dependency for building LK bootloader	The Android Signing tools for the LK bootloader require Java Runtime Environment (JRE) to be installed on the host platform. JRE has not been added to the build environment, so must be installed on the build machine manually. Example, for Ubuntu 16.04: sudo apt-get install default-jre	Build
QT19X07-1293	Current consumption – UART1 with AT+KSLEEP=1	If UART1 is mapped to AT commands with AT+KSLEEP=1 AND there is a physical UART connected , the module consumes an average of ~10mA in idle and LPM modes.	Power



ID	Title	Description	Impacted Domain
QTI9X07-959 QTI9X07-1121	Deficiencies in GPIO control from linux	While fixed in modem (see Release 7), certified images (PTCRB, AT&T, Verizon: SWI9X07Y_02.10.xx.00) do not benefit. A <i>new</i> linux patch for older modem versions has been simplified from the previous release. No configuration changes are required so future upgrades will work without reverting configuration. Reference DAYTONA-8683 for patch available from your Sierra support contact.	GPIO
QTI9X07-1007	PCM configuration not allowed by default	The ability to set a profile to use a particular interface is controlled by AT!AVPIFACEPREF (level 2 access). By default, PCM was not included so PCM could not be set with AT!AVCFG without first setting AT!AVPIFACEPREF=F. The factory default has been updated to make PCM available by default, however this will only benefit newly manufactured units so AT!AVPIFACEPREF=F is still required.	Audio
QTI9X07-1494	Legato - boot loop error when built with large database	Customer legato.cwe image must be small enough to fit into the LEFWKRO partition (8MB).	Legato

8 SWI9X06Y Release 8

Release 8 is intended as a certification refresh candidate to resolve several issues for carrier and industrial certification testing. It is important to note that:

- No GCF and PTCRB certification has been granted yet.
- AirVantage and FOTA now has basic functionality

8.1 Software Release Description

8.1.1 Release identification

Component	Revision
Modem Firmware	SWI9X06Y_02.14.04.00 a03347 jenkins 2018/02/19 06:13:56
Linux Firmware	SWI9X06Y_02.14.04.00 2018-02-19_00:48:31
MCU Firmware	002.007
Legato Application Framework	18.01.0_7946ce7181b7425bad75f7086b992e9b
Binary Size	50MB (compressed binaries)
IMEI SV	2
Qualcomm Stack Version	MDM9206.LE.2.0-00115-STD.PROD-1
Linux Kernel Version	Linux version 3.18.44 (jenkins@jenkins) (gcc version 6.2.0 (GCC)) #2 PREEMPT Mon Feb 19 01:13:41 UTC 2018
Supported HW	WP7702 DV1.1+ WP7700 DV 2.1+

Template #:	4124005	Revision:	01.06
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8.1.2 Software Tools Versions

S/W Tools Name	Version
Windows Driver Package	B4773
Windows SDK	None
Skylight	None
Linux Drivers	S2.31N2.49
Linux SDK	SLQS04.00.12

8.1.3 Released Files and Download Processes

Function	Files	Carrier	Modem Firmware	MCU Firmware	Linux Distribution	Base Legato System
Windows one-click firmware upgrade tool	WP77xx_Release 8_TMOBILE.exe	GENERIC (T-Mobile)	SWI9X06Y_02.13.02.00	002.007	SWI9X06Y_02.14.04.00	18.01.0
	WP77xx_Release 8_GENERIC.exe	GENERIC (GCF, not approved)	SWI9X06Y_02.14.04.00	002.007	SWI9X06Y_02.14.04.00	18.01.0
	WP77xx_Release 8_ATT.exe	ATT (not approved)	SWI9X06Y_02.14.04.00	002.007	SWI9X06Y_02.14.04.00	18.01.0

From: <https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-8>

Function	Files
Firmware Components	9999999_9907618_SWI9X06Y_02.14.04.00_00_GENERIC_001.012_000.spk (GCF) 9999999_9907618_SWI9X06Y_02.13.02.00_00_GENERIC_001.009_000.spk (T-Mobile) 9999999_9907787_SWI9X06Y_02.14.04.00_00_ATT_001.011_000.spk linux-SWI9X06Y_02.14.04.00.cwe legato-18.01.0.cwe mcufw_002.007_wp77_f1.cwe

From: <https://source.sierrawireless.com/resources/airprime/software/wp77xx/wp77xx-firmware-release-8>

8.2 Software Changes Description

The WP77xx Release 8, based on modem version SWI9X06Y_02.14.04.00, is functionally equivalent to WP76xx Release 8 [5], with notable differences and features below.

ID	Title	Description	Impacted Domain
Legato			
Various	Legato 18.01.0	Legato 18.01.0 http://legato.io/legato-docs/latest/releaseNotes18010.html Upgrade from Legato 17.11.0 in Release 7	Legato AF
Modem			
Core			

ID	Title	Description	Impacted Domain
QT19X07-1497	Add Qualcomm MDM9206.LE.2.0-00115-STD.PROD-1	Adds Qualcomm baseline MDM9206.LE.2.0-00115-STD.PROD-1	Qualcomm baseline (Release 8)
QT19X07-1591	Increment IMEI SV to 2	IMEI SVN was incremented to 2 for this release	System
AT commands			
QT19X07-583	Add support to select between LTE CAT-M1 and CAT-NB1 RATs	AT!SELCIOT was introduced to allow user to select between LTE CAT-M1 and CAT-NB1 operating modes	AT/SD
QT19X07-1210	[WP77] Add AT command to set SNR scan level to optimize NB1 scanning time on eMTC	AT!SELSNR was introduced to allow user to configure the depth of scan on LTE NB1 networks to optimize scanning time	AT/SD
QMI			
QT19X07-1436	WP7702 failed to retrieve data for Location object (lwm2m.6.0.x) with error "Resource does not exist"	Fixes an issue where the Position Report indication from the LOC engine is not being sent to inactive clients.	QMI/NAS
RF			
QT19X07-1540	Update GSM Max Power Level NVs	GSM Max Power Level NVs were updated to pass FCC certification and to stay consistent with WPx5xx Antenna Gain settings	RF/NV
QT19X07-1285	[WP77] RFCal Verification Failures on eMTC	Fixes numerous issues seen during LTE CAT-M1 RF Calibration Verification at factory	RF/Cal

8.3 Known Issues

This section presents all known issues in this release.

ID	Title	Description	Impacted Domain
Features			
Various	AirVantage Connectivity	AirVantage Connectivity now has basic functionality. Full validation is still being performed.	AirVantage
Various	FOTA	FOTA support has been implemented and has basic functionality. Full validation is still being performed.	FOTA
Bugs			
LE-7418	avcControl will block other data connections from using that APN	If the Legato AirVantage connector has a connection established, any other data connect to that APN is blocked. Conversely if a data connection is already established on that APN, the Legato AirVantage connector cannot connect. <i>The resolution is currently undergoing full testing for delivery in Release 9.</i>	Networking

ID	Title	Description	Impacted Domain
LXSWIREF-273	Re-building kernel fails with Yocto 2.2 due to "metadata not deterministic" error	Every kernel build from the source distribution must be built from clean or before each kernel re-build, execute the following: touch meta-swi/meta-swi-mdm9x28/recipes-kernel/linux/linux-quic_git.bb	Build
QT19X07-1308	Missing Java dependency for building LK bootloader	The Android Signing tools for the LK bootloader require Java Runtime Environment (JRE) to be installed on the host platform. JRE has not been added to the build environment, so must be installed on the build machine manually. Example, for Ubuntu 16.04: sudo apt-get install default-jre	Build
QT19X07-599	Sierra SIM Connectivity	AT+COPS=2 shall NOT be used with this module to trigger any network steering	Connectivity
DAYTONA-8511	UART1 does not wake up on Rx	After a few seconds of idle time the UART enters a state of runtime suspend after which time serial activity from the host cannot wake the module to receive. This issue was introduced in Release 7. A patch to the linux distribution is available	UART
QT19X07-780	Current consumption and data throughput – HSIC enabled	The module will not enter sleep mode if HSIC is enabled, and the host platform does not have an HSIC (ethernet) controller connected. Minimum power consumption while not in sleep mode is ~40mA. This has also been found to increase CPU loading and consequently CAT4 max downlink throughput is degraded in some cases. For platforms without a HSIC controller, this feature should be disabled with AT!CUSTOM="HSICENABLE",0	Power, Throughput
QT19X07-1293	Current consumption – UART1 with AT+KSLEEP=1	If UART1 is mapped to AT commands with AT+KSLEEP=1 AND there is a physical UART connected , the module consumes an average of ~10mA in idle and LPM modes.	Power
QT19X07-1001	Current consumption in PSM mode	Current consumption is not optimized in PSM mode. Significant improvements are planned for the next release. See Software Changes Description for the WP76xx Release 8 [5] . ULPS mode is not affected.	Power/PSM

9 SWI9X06Y Release 7

Release 7 is provided for customer samples to demonstrate initial PSM support, and is intended to resolve a number of issues for carrier and industrial certification testing. It is important to note that:

- Legato Application Framework is supported, but limited validation has been performed
- No formal GCF, PTCRB or Carrier certification testing has been performed.
- Linux Firmware source code will not be published to Source
- AirVantage and FOTA are not supported



9.1 Software Release Description

9.1.1 Release identification

Component	Revision
Modem Firmware	SWI9X06Y_02.13.02.00 7cfe8a jenkins 2017/12/22 05:21:50
Linux Firmware	SWI9X06Y_02.13.02.00 2017-12-22_06:09:25
MCU Firmware	002.006
Legato Application Framework	17.11.0_3238a5a8f17311821611a475aba506b4
Binary Size	50MB (compressed binaries)
IMEI SV	1
Qualcomm Stack Version	MDM9206.LE.2.0-00109-STD.PROD-1
Linux Kernel Version	Linux version 3.18.44 (jenkins@jenkins) (gcc version 6.2.0 (GCC)) #2 PREEMPT Fri Dec 22 06:18:41 UTC 2017
Supported H/W	WP7702 DV1.1+ WP7700 DV 2.1+

9.1.2 Software Tools Versions

S/W Tools Name	Version	
Windows Driver Package	B4773	
Windows SDK	None	
Skylight	None	
Linux Drivers	S2.31N2.49	Important upgrade required for multi RMNET support.
Linux SDK	SLQS04.00.11	

9.1.3 Released Files and Download Processes

Release 7 is provided as programmed hardware samples only. Software update packages are available upon request, and is not distributed on Source.

Function	Files	Carrier (not approved)	Modem Firmware	MCU Firmware	Linux Distribution	Base Legato System
Windows one-click firmware upgrade tool	WP77xx_Release 7_GENERIC.exe	GENERIC	SWI9X06Y_02.13.02.00	002.006	SWI9X06Y_02.13.02.00	17.11.0
	WP77xx_Release 7_ATT.exe	ATT	SWI9X06Y_02.13.02.00	002.006	SWI9X06Y_02.13.02.00	17.11.0
Linux SPK files	WP77xx_Release 7_GENERIC.spk	GENERIC	SWI9X06Y_02.13.02.00	002.006	SWI9X06Y_02.13.02.00	17.11.0
	WP77xx_Release 7_ATT.spk	ATT	SWI9X06Y_02.13.02.00	002.006	SWI9X06Y_02.13.02.00	17.11.0

9.2 Software Changes Description

The WP77xx Release 7, based on modem version SWI9X06Y_02.13.02.00, is functionally equivalent to WP76xx Release 7 [\[5\]](#), with notable differences and features below.

Template #:	4124005	Revision:	01.06
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ID	Title	Description	Impacted Domain
Legato			
Various	Legato 17.11.0	Legato 17.11.0 http://legato.io/legato-docs/latest/releaseNotes17110.html http://legato.io/legato-docs/latest/releaseNotes17100.html http://legato.io/legato-docs/latest/releaseNotes17090.html Upgrade from Legato 17.08.1 in Release 6	Legato AF
LE-7907	Legato APIs to support 3GPP eDRX (specification)	Adds support for Legato APIs used to configure eDRX	Legato, LPWA
Modem			
Core			
QT19X07-1191	Add Qualcomm MDM9206.LE.2.0-00109-STD.PROD-1	Adds Qualcomm baseline MDM9206.LE.2.0-00109-STD.PROD-1	Qualcomm baseline (Release 7)
Various	eDRX	eDRX is supported. Legato API support have also been added.	LPWA
N/A	Extended Coverage	Extended Coverage mode A on LTE CAT M1 is supported but not tested. Pending validation during industrial certification	LPWA
Data			
QT19X07-608	[WP7702] Consecutive data connection doesn't work using SLQS	Fixes the issue where user is unable to start a second consecutive data connection on Linux without resetting the device	DATA
AT commands			
QT19X07-1259	Add LTE CAT M1 and CAT NB1 into AT!SELACQ	Adds support to allow user to configure the network acquisition order between LTE CAT M1, CAT NB1, and GSM to optimize scanning times. Currently, the user cannot set the preference of CAT M1 and NB1 networks separately.	AT
QT19X07-1223	[9x06] Restore +CNUM, \$QCPBMPREF AT commands	Re-enables AT+CNUM ad \$QCPBMPREF AT commands	AT
QT19X07-1274	[WP7702][AT&T][LTE-FLD-2-1502] - LTE Normal MM Detach From Idle Mode	Fixes an issue where AT+COPS=0 will return "SIM ERROR" after executing AT+COPS=2	AT
QT19X07-1161	Incorrect RAT reported in AT+COPS on Cat-M1	Corrects the RAT displayed in AT+COPS output on LTE CAT-M1 network	AT
QMI			
QT19X07-1264	QMI_NAS_GET_TECHNOLOGY_PREFERENCE disabled in 9x06 build	Re-enables the following QMI commands to allow host to set RAT preference on the device: - QMI_NAS_GET_TECHNOLOGY_PREFERENCE - QMI_NAS_SET_TECHNOLOGY_PREFERENCE	QMI/NAS
QT19X07-1123	[Unknown SIM State] on WP7702	Re-enables the QMI CAT service to handle Legato SIM management APIs	QMI/CAT
RF			
QT19X07-1328	Update GSM backoff default NVs	Introduces GSM multi slot backoff for power consumption savings	RF/NV
QT19X07-1329	GNSS Desense in LTE CATM Traffic	Adds GNSS Blanking to LTE Bands to reduce GNSS desense	RF/Driver

ID	Title	Description	Impacted Domain
QT19X07-1159	Default NV update, GSM Timing, LIMIT_VS_TEMP	Updates the default static NVs for GSM Timing and Limit vs. Temperature data	RF/NV
QT19X07-1049	Crash during RF Cal/ Verification on Non-Signalling calls	Fixes a crash seen during LTE CATM RFCAL verification in non-signaling mode	RF
QT19X07-1135	Make GSM PA optional for WP7700 HW	Removes GSM PA scanning on RFFE bus for WP7700 HW to fix the issue where device will be stuck in Factory Test Mode	RF/Driver
QT19X07-1271	Remove B39 from default band mask	Qualcomm has removed LTE TDD support on this chipset, so B39 support has been removed	RF/Driver

9.3 Known Issues

This section presents all known issues in this release.

ID	Title	Description	Impacted Domain
Features			
Various	AirVantage Connectivity	AirVantage is not supported	AirVantage
Various	FOTA	FOTA is not supported	FOTA
Various	Partial AT support	This release does not support all planned AT commands.	AT
Various	PSM	PSM is supported in this release. Current consumption is still yet to be optimized.	LPWA
QT19X07-1210	Long scanning time on LTE CAT NB1 networks	<p>By Qualcomm's design, the UE will take an extended period of time (up to 20 minutes, may be even longer depending on network conditions) to scan for cells on the LTE NB1 network during the first initial attach. This will take even longer if there is no NB1 service available.</p> <p>In the case when there's no NB1 network, the user can use AT!SELACQ to set LTE-NB1 RAT to a lower priority so the NB1 cells are not scanned before CAT M1 and GSM.</p>	Network Access
Bugs			
LE-7418	avcControl will block other data connections from using that APN	If the Legato AirVantage connector has a connection established, any other data connect to that APN is blocked. Conversely if a data connection is already established on that APN, the Legato AirVantage connector cannot connect.	Networking
LXSWIREF-273	Re-building kernel fails with Yocto 2.2 due to "metadata not deterministic" error	Every kernel build from the source distribution must be from clean or before each kernel re-build, execute the following: touch meta-swi/meta-swimdm9x28/recipeskernel/linux/linux-quic_gjit.bb	Build

ID	Title	Description	Impacted Domain
LXSWIREF-248	UBIFS: User partition corruption after number of power cuts	If power is cut suddenly, it is possible that data will be wiped out from UBIFS partition mounted @ /mnt/flash mount point.	Linux Filesystem
QT19X07-583	AT!SELRAT support for LTE CAT-M1 and CAT-NB1	AT!SELRAT currently cannot be used for RAT selection between LTE CAT-M1 and CAT-NB1 networks. It can only be used to select between GSM and LTE. Please use AT!SELACQ for setting RAT preference in the meantime.	Network Access
QT19X07-1322	WP modules boot into low power mode	If W_DISABLE feature is enabled (via AT!PCOFFEN), some hardware platforms (depending on line capacitance) may observe that this condition is incorrectly triggered on power up and the module stays in low power mode (radio off). To confirm if this is the case use at!pcinfo? to check if W_DISABLE is the condition holding the module in low power mode.	RF
QT19X07-599	Sierra SIM Connectivity	AT+COPS=2 shall NOT be used with this module to trigger any network steering	Connectivity
QT19X07-780	Current consumption – HSIC Enabled	The module will not enter sleep mode if HSIC is enabled, but host platform does not have ethernet controller connected. Minimum power consumption while not in sleep mode is ~40mA.	Power
QT19X07-1224 QT19X07-1225	Current consumption – UART1 mapped to AT	If UART1 is mapped to AT commands, the module consumes an average of ~10mA in idle and lpm modes.	Power
QT19X07-1001	Current consumption in PSM mode	Current consumption is higher than expected in PSM mode because I2C bus is enabled	Power/PSM
QT19X07-959 QT19X07-1121	Deficiencies in GPIO control from linux	While fixed in modem (see above), certified images do not benefit. There is, however, a workaround for older modem versions. 1) Configure desired GPIOs in AT+WIOCFG with function=0 e.g. AT+WIOCFG=13,0 2) Remove the following lines from kernel/drivers/gpio/gpiolib-sysfs.c	GPIO
QT19X07-1128	GPSREFLOC customization support	Customization to report reference location in NMEA stream is not supported	GNSS
LXQMIDRV-216	Linux SDK	Tethered Linux host may freeze during suspend/resume stress testing	Drivers

10 SWI9X06Y Release 6

Release 6 is provided for initial customer samples and is intended to be the initial firmware candidate for carrier and industrial certification testing. It is important to note that:

- Legato Application Framework is not fully supported
- No formal GCF, PTCRB or Carrier certification testing has been performed.
- Linux Firmware source code will not be published to Source
- AirVantage and FOTA are not supported

10.1 Software Release Description

10.1.1 Release identification

Component	Revision
Modem Firmware	SWI9X06Y_02.09.02.00 d875da jenkins 2017/10/22 22:48:21
Linux Firmware	SWI9X06Y_02.09.02.00 2017-10-22_23:00:42
MCU Firmware	002.004
Legato Application Framework	17.08.1_c073924cf80081f79fd125fae2f0d6cf
Binary Size	54MB (compressed binaries)
IMEI SV	1
Qualcomm Stack Version	MDM9206.LE.2.0-00103-STD.PROD-1
Linux Kernel Version	Linux version 3.18.44 (jenkins@jenkins) (gcc version 4.9.1 (GCC)) #2 PREEMPT Sun Oct 22 23:14:48 UTC 2017
Supported HW	WP7702 DV1.1+

10.1.2 Software Tools Versions

S/W Tools Name	Version	Resource file
Windows Driver Package	B4762	
Windows SDK	None	
Skylight	None	
Linux Drivers	S2.29N2.44	
Linux SDK	SLQS04.00.10.1	

10.1.3 Released Files and Download Processes

Release 6 is provided as programmed hardware samples only. Software update packages are available upon request, and is not distributed on Source.

Download Option	Files
Windows	WP77xx_Release6_GENERIC_test.exe
SPK files	WP77xx_Release6_GENERIC_test.spk

10.2 Software Changes Description

The WP77xx Release 6, based on modem version SWI9X06Y_02.09.02.00, is functionally equivalent to WP76xx Release 6 [5], with notable differences and features below.

ID	Title	Description	Impacted Domain
Legato			
Various	Legato 17.08.1	Legato 17.08.1 http://legato.io/legato-docs/latest/releaseNotes17081.html	Legato AF



ID	Title	Description	Impacted Domain
Modem			
Core			
QT19X07-991	Add Qualcomm MDM9206.LE.2.0-00103-STD.PROD-1	Add Qualcomm MDM9206.LE.2.0-00103-STD.PROD-1	Qualcomm baseline (Release 6)
HW variants			
Various	WP77xx support added	BSP and RF driver support was added for WP7702 and WP7700.	RF/BSP

10.3 Feature Notes

10.3.1 Multi RMNET vs. QMAP

In previous generation devices, multiple RmNet interfaces were supported through dedicated BAM channel interfaces, configured via USB composition. This approach imposed a limit on the number of interfaces that could be simultaneously supported. To remove that limitation, QMAP was introduced to multiplex multiple virtual channels over a single interface. To make use of this feature, the number of interfaces must be set (AT!NETNUM) and new host drivers are required (S2.29N2.47 or later). Note, however, that in moving to multiple RmNet with QMAP only a single dedicated channel is supported. If only a single RmNet is required, operation in non QMAP mode (AT!NETNUM=0) is still supported with older drivers (S2.29N2.44).

See SLQS04.00.10.1 release package for more details. QMAP is not supported by the Windows driver, and only one RmNet interface will be exposed regardless of AT!NETNUM setting.

10.3.2 Voice/VoLTE

This commercial release does not support Audio, Voice or VoLTE.

10.4 Known Issues

This section presents all known issues in this release.

ID	Title	Description	Impacted Domain
Features			
Various	AirVantage Connectivity	AirVantage is not supported	AirVantage
Various	FOTA	FOTA is not supported	FOTA
Various	Partial AT support	This release does not support all planned AT commands.	AT
Various	PSM	PSM is not supported in this Release.	LPWA
Various	eDRX	eDRX is supported on the protocol level, but current consumption needs to be optimized.	LPWA
N/A	Extended Coverage	Extended Coverage mode A on LTE CAT M1 is supported but not tested. Pending validation during industrial certification	LPWA

ID	Title	Description	Impacted Domain
Various	Linux Boot time is not optimized	<p>Various debug capabilities and debug modules are included in the Kernel and Rootfs, which increases the Sierra Linux system boot time.</p> <p>Modem communication interfaces initialize after the kernel is started, and a delay is observed between USB enumeration and functional communication on the USB interfaces such as the Network adapter, Modem port, etc. Delays of approximately 5 seconds are measured on typical power up, and up to 25 seconds when Linux is starting up for the first time on blank flash.</p>	Linux / Boot
Bugs			
QT19X07-608	Consecutive Data Connection on Linux	On a Linux host, user is currently only able to make one data connection after boot up. The device needs to be reset if the first call is disconnected from the host and a second data connection is required. This does not affect Windows users.	Connectivity
QT19X07-583	RAT selection and acquisition order for LTE CAT-M1 and CAT-NB1	There is currently no AT command to select RAT preference between LTE CAT M1 and NB1. The device will by default search for CAT M1 network first, and then NB1.	Network Access
LXSWIREF-211	Legato ECM Interface	ECM MAC address on the host doesn't match the WP for linux kernel 4.4.x hosts (e.g. Ubuntu 14.04 / 16.04) Note: This will be fixed in the next release.	USB / ECM
QT19X07-599	Sierra SIM Connectivity	AT+COPS=2 shall NOT be used with this module to trigger any network steering	Connectivity
QT19X07-310	Data from the UE to the DHCP server failed	When customization DHCPRELAYENABLE is enabled, allow only UDP packets for port 67 with target IP address 0xFFFFFFFF to be filtered to the internal DHCP server on modem. All others are sent to the air interface. Note: This will be fixed in the next release.	DHCP
QT19X07-780	Current consumption	<p>The module will not enter sleep mode if:</p> <ol style="list-style-type: none"> 1) HSIC is enabled, but host platform does not have ethernet controller connected. 2) Module is booted without USB connected, unless USB is subsequently connected. <p>Minimum power consumption while not in sleep mode is ~40mA. PSM is not yet supported, however ULPS is.</p>	Power
QT19X07-959	GPIO24 defaults to high after exporting	Upon initial export of GPIO24 from sysfs it is initially high rather than input, no pull	GPIO
QT19X07-995	Unable to get MS-Assisted GPS fix in some cases.	Device rejecting server SSL certificate because the key length is smaller than the minimum value. Pending Qualcomm CR 978483	GNSS

11 Troubleshooting

Please contact customer service for support and debug

12 Certification Description

Release 6 is not intended for customer use as industrial or carrier certification candidates.

13 Restrictions and Additional Information

This section presents additional information or restrictions that must be taken into account.

ID	Description (What/When)	Impacted Domain
Various	Modules should not be used on live networks	Certification