| Author: | Sierra Wireless | | | | | | | | | Date: | February 11, 2010 | | |

| APN Content Level | | BASIC | | INTERMEDIATE | ✔ | ADVANCED | | Confidentiality | | Public | ✔ | Private | |

| Software Compatibility* | FW: | 7.x | Software Suite: | 2.X | Plug-Ins: | TCP/IP | N/A | Security | N/A | Compiler Used: | N/A | Reference Hardware | No |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Internet | N/A | LUA | N/A | | | Reference Software | No |
| | | | | | | C-GPS | N/A | | | RTE : | N/A | | |

*\* refer to software compatibility matrix section for more detail*

| Hardware Compatibility | AirPrime Q Series : | Q2686 | ✔ | Q2687 | ✔ | Q26Extreme | ✔ | Q26Elite | |
|---|---|---|---|---|---|---|---|---|---|
| | AirPrime WMP Series : | WMP50 | ✔ | WMP100 | ✔ | WMP120 | ✔ | WMP150 | ✔ |
| | AirPrime WS Series : | WISMO218 | | WISMO228 | | | | | |
| | AirPrime AR Series | AR3550 | | AR5550 | | AR8550 | | | |
| | AirLink FXT Series : | Fastrack Xtend GPRS | ✔ | Fastrack Xtend EDGE | ✔ | Fastrack Xtend HSPA | ✔ | Fastrack Xtend CDMA | |
| | Legacy products (GSM): | Q24Classic | | Q24Plus | | Q24Extended | | Q24Auto | |
| | | Fastrack Supreme | | Q64 | ✔ | Q52 Omni | | | |
| | Legacy products (CDMA): | Q2438F | | Q2438R | | | | | |

## 1   Version

Application Notes may be updated over their lifetime.  To ensure you design with the correct version, please check the application notes page in www.sierrawireless.com for latest versions.

## 2   Introduction

The purpose of this application note is to present the recovery mechanism introduced in the Software Suite. The goal is to avoid infinite and uncontrolled reset loops in the firmware. For example, a typical case of the firmware instability is that when a new application is installed, and when this application is not compatible with the firmware, an infinite loop can be triggered.

## 3   Reset Loop Detection

For the firmware, a start-up KO is an unwanted reset before the end of the last event among these 2 events :

- 30s after a reset (value of the Software Suite)
- 10s after the initalisation of the AT command parser, in order to ensure that an AT command can be sent in all cases.
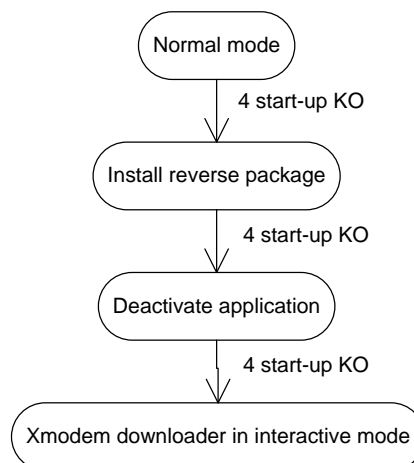
Customer reset (AT+CFUN=1...) and hardware resets are considered as wanted resets.

A reset loop is detected if there are 4 start-up KO in a row.

## 4   Recovery Mechanism

This mechanism starts when a reset loop is detected (4 start-ups KO in a row). There are 3 main steps :

1. Try to apply a reverse package.
2. Deactivate the Open AT® application.
3. Start the xmodem downloader in interactive mode.

## 4.1 Reverse package

The first action is to try to go back to the old firmware or application. Indeed, after an upgrade, if a reverse package was present in the download package (in DOTA or IDS volume), a flag is set to indicate that a recovery is possible. If the software is unstable, and if this flag is set, the bootloader will install the reverse patch.

This functionality is related to DOTA3 and IDS. Consult the IDS or DOTA documentation to know how to retrieve the fact that a reverse package was installed.

The flag is unset when the firmware considers that the upgrade was successful. In Open AT® Software Suite, it is done 5 minutes after a reset.

## 4.2 Application deactivation

If the reverse package was not present, the firmware waits for another reset loop detection. Then the application is deactivated. If it was the cause of the resets, the firmware becomes stable and  it is now possible to :

- Call the xmodem downloader
- Install a new application or firmware by IDS.

## 4.3 Xmodem downloader in interactive mode

If the firmware continues resetting, the xmodem downloader takes the focus, and send a "+WDWL" unsollicited AT response to warn the user. It is now possible to  download a new firmware or a new application by sending the "AT+WDWL" command.

# 5 Support

For direct clients: contact your Sierra Wireless FAE

For distributor clients: contact your distributor FAE

For distributors: contact your Sierra Wireless FAE

# 6 Document History

| Level | Date | History |
|-------|------|---------|
| 001 | November 7, 2008 | Initial document |
| 002 | February 11, 2010 | Sierra Wireless format update |

# 7 Legal Notice

**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 blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the Sierra Wireless modem **MUST BE POWERED OFF**. 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.

Note:        Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. Sierra Wireless modems may be used at this time.

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.

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| 6,191,741 | 6,199,168 | 6,339,405 | 6,359,591 | 6,400,336 | 6,516,204 | 6,561,851 | 6,643,501 |
| 6,653,979 | 6,697,030 | 6,785,830 | 6,845,249 | 6,847,830 | 6,876,697 | 6,879,585 | 6,886,049 |
| 6,968,171 | 6,985,757 | 7,023,878 | 7,053,843 | 7,106,569 | 7,145,267 | 7,200,512 | 7,295,171 |
| 7,287,162 | D442,170 | D459,303 | D599,256 | D560,911 | | | |

and other patents pending.

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