

LMX9820A Bluetooth Serial Port Module - Firmware Release Notes

National Semiconductor
Firmware Release Notes
May 2006
Revision 1.2



Introduction

The National Semiconductor® LMX9820A Bluetooth™ Serial Port module is a highly integrated radio, baseband controller and memory device implemented on an FR4 substrate. All hardware and firmware is included to provide a complete solution from antenna through the complete lower and upper layers of the Bluetooth stack, up to the application including the Generic Access Profile (GAP), the Service Discovery Application Profile (SDAP), and the Serial Port Profile (SPP). The module includes a configurable service database to fulfil service requests for additional profiles on the host.

LMX9820A is optimized to handle the data and link management processing requirements of a Bluetooth node. The firmware supplied within this device offers a complete Bluetooth (v1.1) stack including profiles and command interface. This firmware features point-to-point and point-to-multipoint link management supporting data rates up to the theoretical maximum over RFCOMM of 704 kbps. The internal memory supports up to three active Bluetooth data links and on active SCO link.

Due to our continuously ongoing quality tests and firmware improvements, several changes to the firmware have been made to provide highest reliability and performance.

This document describes all release changes within the LMX9820A firmware.

This document is based on:

Table 0-1. LMX9820A module configuration

| Item | Version |
|---------------------------------------|-----------------|
| Hardware | LMX9820ASM |
| Firmware | V6.00 and later |
| Actual Firmware Release in production | V6.23 |

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1.0 Known Bugs

1.1 FIRMWARE 6.23

Table 1-1. Known bugs on version 6.23

| Bug Type | Description | Workaround |
|----------|-------------|------------|
| | | |

1.2 FIRMWARE 6.21

Table 1-2. Known bugs on version 6.21

| Bug Type | Description | Workaround |
|-----------------------------------|--|---|
| Store SDP command confirm timeout | The Store SDP confirm event requires a dedicated time-out before a new command can be sent | Software workaround possible. See Section 2.1 “SDP records” on page 2 |
| Wrong RF Test Command confirm | The RF Test Command is confirmed by the wrong event number | No Workaround possible |

2.0 Workarounds

2.1 SDP RECORDS

Valid for 6.21 and before: If several store SDP records have to be performed repetitively, insert a delay of about **1 second** **after** receiving the Store SDP **Confirm Event**, and **before** sending another store SDP command.

3.0 Firmware Release History

3.1 VERSION 6.23 (PRODUCTION VERSION)

Release date: 04th April 2006

Table 3-1. Firmware Release Changes 6.23

| Issue | Type | Description |
|---|-------------|--|
| Store SDP command confirm timeout | Bug Fix | Bug corrected. No timeout required anymore |
| RF Test Command confirmed by wrong event | Bug Fix | Bug Corrected. Command is confirmed by the correct event |
| Improved Paging | Bug Fix | Bug Corrected. Connection establishment to mobile phones is improved |
| Extend Event Filter options | New Feature | Event Filter setting 0x03 added to not leave transparent mode even on a UART BREAK |
| Improved RF test command | New Feature | RF Test Command updated to improve Standalone regulator tests |
| Pin Request Event | New Feature | This feature allows to store a 0 length pin code, which forces a Pin Request event to the host if authentication is required |
| Winbond codec support | New Feature | Additional support for Winbond W681360 |
| PCM slave functionality | New Feature | PCM slave functionality as additional audio setting |
| Limited Discoverability in NVS | New Feature | Capability to store Limited Discoverability mode in NVS |
| Additional default Sniff Mode in NVS, used for default connections and incoming links | New Feature | Default Sniff mode parameters stored in NVS. Parameters used if Default connection configured to use them or on incoming link if device is in Automatic Sniff mode |
| Additional Operation Mode Automatic Sniff | New Feature | Switch an incoming link to sniff mode using Default Sniff parameters |
| Additional Commands | New Feature | Read NVS Write NVS Pin Code Request PCM Slave configuration Default Sniff configuration |
| Updated Commands | New Feature | Write Operation Mode Set Pincode Set Audio config Set Default Audio config |
| 32 khz usage reactivated | New Feature | Changed internal registers to allow 32 khz usage by using PMM bit |

Note: Version 6.22 generated for internal use only.

3.2 VERSION 6.21 (PRODUCTION VERSION)

Release date: 11th November 2004

Table 3-2. Firmware Release Changes 6.21

| Issue | Type | Description |
|--|---------|--|
| Device using DV package after switching to HV2/HV3 | Bug fix | In case HV1 is used for a SCO link, bluetooth devices use the mixed data/voice package DV to still transmit data over an audio link. After changing the SCO packet type from HV1 to HV2/HV3, the device still used DV, even if DM1 could be used. Problem has been fixed on application level. |

Note: Version 6.19/6.20 generated for internal use only.

3.3 VERSION 6.18 (PRODUCTION VERSION)

Release date: 14th October 2004

Table 3-3. Firmware Release Changes 6.18

| Issue | Type | Description |
|---------------------------------|---------|--|
| Optimized Radio Driver settings | Bug Fix | Radio register settings have been optimized. |

Note: Version 6.17 generated for internal use only

3.4 VERSION 6.16

Release date: 02nd September 2004

Table 3-4. Firmware Release Changes 6.16

| Issue | Type | Description |
|------------------------------------|-------------|--|
| Added Default Link Latency feature | New Feature | Added support for storing a default Latency / poll period to be used for all SPP connections established. |
| Power save mode event sent twice | Bug Fix | Fixed a problem with the "Power save mode" event, which sometimes has been sent twice. |
| Fixed L2CAP error | Bug Fix | Fixed error in L2CAP, which would cause the L2CAP connection to be disconnected if a remote device initiates a reconfiguration of the L2CAP connection after it has been established completely. |

3.5 VERSION 6.15

Release date: 27th August 2004

Table 3-5. Firmware Release Changes 6.15

| Issue | Type | Description |
|----------------------------------|---------|--|
| Fixed problem in buffer handling | Bug Fix | Fixed problem in buffer handling, which caused a device sending data still in buffer from a previous link. |

Note: Version 6.14 generated for internal pre-testing of 6.15 bugfix only.

3.6 VERSION 6.13

Release date: 9th August 2004

Table 3-6. Firmware Release Changes 6.13

| Issue | Type | Description |
|---------------------|----------------------|--|
| Fixed Startup issue | Hardware related fix | Due to the oscillator startup time of the radio, the internal base-band got wrong or noisy input clock. Issue fixed by adding startup delay on power-up and after reset. |

3.7 VERSION 6.11

Release date: 8th July 2004

Table 3-7. Firmware Release Changes 6.11

| Issue | Type | Description |
|-------------------------|---------|---|
| Fixed RTS state problem | Bug fix | In transparent mode, the LMX9820A uses the hardware handshaking to indicate full UART buffers to the host. In case the bluetooth link dropped while the RTS was cleared, the device link released event has been sent but the RTS has not been activated again. |
| Power Control problem | Bug fix | The Link Manager has been fixed for correct control of the output power of a remote device. |

3.8 VERSION 6.10

Release date: 01th July 2004

Table 3-8. Firmware Release Changes 6.10

| Issue | Type | Description |
|----------------------------------|-------------|---|
| Added volume control | New feature | New commands added: - "Set Volume Control" - "Get Volume Control" |
| Added mute/un-mute of microphone | New feature | New commands added: - "Mute" |
| Added Change SCO packet type | New feature | New commands added: - "Change SCO packet type" |

Table 3-8. Firmware Release Changes 6.10

| | | |
|--|-------------|---|
| Additional Event Filter | New feature | The "Set Event Filter" command has been extended with filter setting 0x03. The setting extends level 2 by also filtering out the "BREAK" signal if a link has been released. |
| ACL events not always set | Bug fix | Baseband events have been filtered so that LMX9820A application did not get all ACL specific events. The filter has been removed. |
| Data corruption in case inquiry buffer is full | Bug fix | The LMX9820A is able to store a limited number of devices during an inquiry, to be able to filter multiple responses from the same device. In case the buffer was full incoming data have been corrupted. |

3.9 VERSION 6.00 (INITIAL VERSION)

Release date: 03rd June 2004

Table 3-9. Firmware Release Changes 5.09

| | | |
|---------------------|-------------|--|
| Initial Release | New release | Firmware based on LMX9820v5.15. Changed radio drivers from LMX5251 to LMX5252. |
| Added Audio Support | New feature | The firmware has been enabled to establish and accept SCO links, to be able to transmit and receive synchronous audio data. The audio data are directly routed to and from the PCM interface to the bluetooth link controller. New commands: - "Establish SCO Link" - "Release SCO Link" - "Set Default Audio Settings" - "Get Default Audio Settings" - "Set Audio Settings" - "Get Audio Settings" New Indicators: - "SCO Link Established" - "SCO Link Released" |