L26-T(B) GNSS Update Rates Application Note

GNSS Module Series

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About the Document

Document Information	
Title	**L26-T(B) GNSS Update Rates Application Note**
Subtitle	GNSS Module Series
Document Type	Application Note
Document Status	Released

Revision History

Version	Date	Description
-	2021-08-10	Creation of the document
1.0	2021-08-16	First official release
1.1	2021-08-30	Added customized ordering code.

Contents

1 Introduction

Using a dedicated firmware version, the L26-T(B) GNSS module can support update rates higher than 1 Hz. Below are detailed guidelines on how to achieve this functionality.

2 Firmware Upgrade

The L26-T module can be upgraded for evaluation purposes to L26-TB firmware supporting update rates up to 15 Hz. This process will require an activation code described in ***Chapter 3***.

1. Ask your FAE for the dedicated **L26-TB firmware** and **STA808x-9x Firmware Upgrade** tool.

2. Start **STA808x-9x Firmware Upgrade** tool and load the firmware file supplied from your FAE. Be sure to pick the file that ends in **_UPG.bin** and make sure to enable **Erase NVM** and set **1024 KB**, all other options must be disabled.
   NMEA baud rate should match the current NMEA baud rate of the module.
   Baud Rate should be kept as 460800 bps.

3. Turn on the module and wait for NMEA messages to be transmitted over the port, then click **Start**.

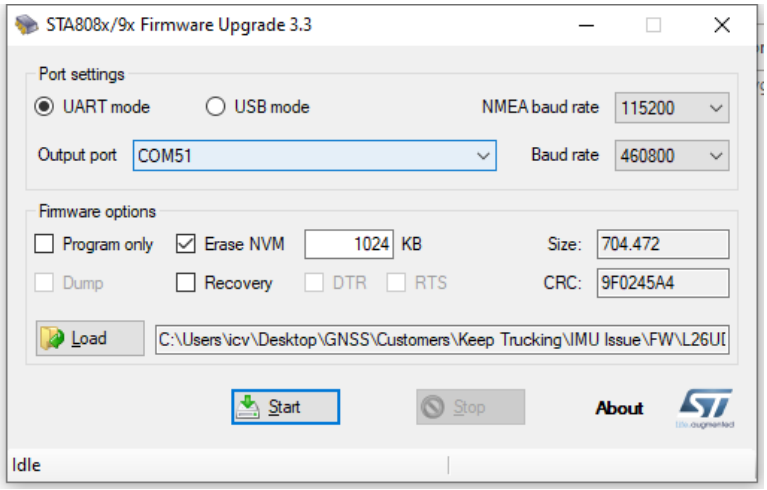

Figure 1: STA808x-9x Firmware Upgrade Tool

3 Set Activation Code

When evaluating this firmware, it's required to set an activation code. This process is only required once per device, and it's not required on production.

1. Issue the command **$PQTMSGR,1,0,END$*18**.

2. If the device replies with **$PQTMSGR,2,<DEVICE ID>,END$**, then provide the output of the command to your FAE and ask for instructions on how to activate the device. This is only required when evaluating this firmware.

3. Follow your FAE's instructions to activate the device.

4 Configure the Device for Higher Output Rate

The firmware supports the following update rates: 1 Hz, 5 Hz, 10 Hz and 15 Hz. The configuration depends on bits 20-23 of CDB 228. For that we need to modify bits 20-23 according to the following table:

Update Rate	Hex Mask Value	Nibble Value	Example Value
1 Hz	0x00000000	0	0x7F022000
5 Hz	0x00400000	4	0x7F422000
10 Hz	0x00800000	8	0x7F822000
15 Hz	0x00C00000	C	0x7FC22000

1. We recommend setting a baud rate of 230400 bps or higher to prevent data loss when the module is operating at higher update rates.

Example:

```
// Set the module to 230400 bps:
$PSTMCFGPORT,0,0,1,230400
$PSTMSAVEPAR
$PSTMSRR
```

2. Configure the update rate according to the previous table.

Example:

```
// Configure the update rate to 10 Hz:
$PSTMGETPAR,1228
$PSTMSETPAR,1228,0x7f022000*03          // 1 Hz
$PSTMSETPAR,1228,0x7f822000             // 10 Hz
$PSTMSETPAROK,1228*3A
```

3. Save the configuration and reboot the module.

Example:

```
$PSTMSAVEPAR
$PSTMSRR
```

4. Check the time field in RMC messages. It should show 100 ms increments for 10 Hz.

```
$GPRMC,174112.100,A,4449.40215,N,02024.98043,E,0.3,186.6,090821,,,A*6A
$GPRMC,174112.200,A,4449.40215,N,02024.98043,E,0.2,186.6,090821,,,A*68
$GPRMC,174112.300,A,4449.40215,N,02024.98043,E,0.2,186.6,090821,,,A*69
$GPRMC,174112.400,A,4449.40215,N,02024.98043,E,0.1,186.6,090821,,,A*6D
$GPRMC,174112.500,A,4449.40215,N,02024.98043,E,0.1,186.6,090821,,,A*6C
$GPRMC,174112.600,A,4449.40215,N,02024.98043,E,0.1,186.6,090821,,,A*6F
```

5 Example of One Second of Data

```
$GPRMC,173933.100,A,4449.40467,N,02024.98669,E,0.5,181.4,090821,,,A*68
$GPGGA,173933.100,4449.40467,N,02024.98669,E,1,05,4.8,-58.56,M,38.3,M,,*73
$GPVTG,181.4,T,,M,0.5,N,0.9,K,A*0D
$GPRMC,173933.200,A,4449.40473,N,02024.98668,E,0.5,181.4,090821,,,A*6F
$GPGGA,173933.200,4449.40473,N,02024.98668,E,1,05,4.8,-58.56,M,38.3,M,,*74
$GPVTG,181.4,T,,M,0.5,N,0.9,K,A*0D
$GPRMC,173933.300,A,4449.40479,N,02024.98667,E,0.5,181.4,090821,,,A*6B
$GPGGA,173933.300,4449.40479,N,02024.98667,E,1,05,4.8,-58.56,M,38.3,M,,*70
$GPVTG,181.4,T,,M,0.5,N,0.9,K,A*0D
$GPRMC,173933.400,A,4449.40485,N,02024.98666,E,0.5,181.4,090821,,,A*6E
$GPGGA,173933.400,4449.40485,N,02024.98666,E,1,05,4.8,-58.56,M,38.3,M,,*75
$GPVTG,181.4,T,,M,0.5,N,0.9,K,A*0D
$GPRMC,173933.500,A,4449.40491,N,02024.98665,E,0.5,181.4,090821,,,A*69
$GPGGA,173933.500,4449.40491,N,02024.98665,E,1,05,4.8,-58.56,M,38.3,M,,*72
$GPVTG,181.4,T,,M,0.5,N,1.0,K,A*05
$GPRMC,173933.600,A,4449.40497,N,02024.98665,E,0.5,181.4,090821,,,A*6C
$GPGGA,173933.600,4449.40497,N,02024.98665,E,1,05,4.8,-58.56,M,38.3,M,,*77
$GPVTG,181.4,T,,M,0.5,N,1.0,K,A*05
$GPRMC,173933.700,A,4449.40503,N,02024.98663,E,0.5,181.4,090821,,,A*67
$GPGGA,173933.700,4449.40503,N,02024.98663,E,1,05,4.8,-58.56,M,38.3,M,,*7C
$GPVTG,181.4,T,,M,0.5,N,1.0,K,A*05
$GPRMC,173933.800,A,4449.40509,N,02024.98663,E,0.5,181.4,090821,,,A*62
$GPGGA,173933.800,4449.40509,N,02024.98663,E,1,05,4.8,-58.56,M,38.3,M,,*79
$GPVTG,181.4,T,,M,0.5,N,1.0,K,A*05
$GPRMC,173933.900,A,4449.40515,N,02024.98662,E,0.5,181.4,090821,,,A*6F
$GPGGA,173933.900,4449.40515,N,02024.98662,E,1,05,4.8,-58.56,M,38.3,M,,*74
$GPVTG,181.4,T,,M,0.5,N,1.0,K,A*05
$GPGBS,173934.000,76.0,51.4,59.6,,,,*41
$PSTMVRES,0.0,-0.0,-0.0,0.0,0.0,-0.1,,,,,,,,,,,,,,,,,,,,,,,,*08
$PSTMSBAS,0,0,,,,*19
$PSTMCPU,53.45,-1,196*7B
$GPRMC,173934.000,A,4449.40557,N,02024.98650,E,0.9,189.7,090821,,,A*61
$GPGGA,173934.000,4449.40557,N,02024.98650,E,1,05,4.8,-58.39,M,38.3,M,,*74
$GNGNS,173934.000,4449.40557,N,02024.98650,E,AAANNN,05,4.8,-058.4,38.3,,*41
$GPVTG,189.7,T,,M,0.9,N,1.6,K,A*04
$GPGST,173934.000,125.0,82.1,41.0,0.4,76.0,51.4,59.6*5B
$GNGSA,A,3,04,02,,,,,,,,,,,,6.6,4.8,4.5*27
```

```
$GNGSA,A,3,67,68,,,,,,,,,,,,6.6,4.8,4.5*2E
$GNGSA,A,3,303,,,,,,,,,,,,6.6,4.8,4.5*11
$GPGSV,3,1,10,09,72,040,18,07,66,188,22,06,39,241,,11,38,284,*73
$GPGSV,3,2,10,04,36,071,26,02,32,289,25,30,30,211,18,16,20,058,*7E
$GPGSV,3,3,10,03,08,132,,26,06,031,,,,,,,,*73
$GLGSV,2,1,08,67,58,064,35,77,57,079,24,68,49,321,33,78,35,165,*64
$GLGSV,2,2,08,83,22,259,,84,21,322,,76,20,029,,66,13,099,*6E
$GAGSV,2,1,06,303,47,077,32,325,36,073,18,313,33,252,,302,32,136,*63
$GAGSV,2,2,06,307,21,280,,315,11,202,,,,,,,,*64
$PQGNSS,6,2021,8,9,17,39,34,2170,149991999,5,448234261,204164417,-2012,46,18974,9175,-44,-7,
18,0,0,7603,5137,5960,1289,904,470,18,0,-5840,48*2F
```