Public Release Notes

Topic :	**u-blox M8 Flash Firmware 3.01 HPG 1.00**
	UBX-16005104
Author :	mstr
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1 General Information

This firmware operates with u-blox NEO-M8P-0 and NEO-M8P-2 modules.

1.1 Scope

This release note describes the flash firmware 3.01 HPG 1.00.

The release note covers the changes in standard GNSS features compared to the u-blox M8 firmware 3.01 and outlines the new high precision GNSS features of NEO-M8P.

1.1.1 Standard features

This release incorporates the standard features of **u-blox M8 firmware 3.01** unless identified below.

1.2 Released firmware image

Flash image for u-blox NEO-M8P-0. This image contains support for rover operation.	
File	UBX_M8_301_HPG_100_ROVER.44a24b5cdf68287a1fb5ee8127dcb8fb.bin
FW ID String	EXT CORE 3.01 (111160) HPG 1.00
ROM base support	2.01, 3.01

Flash image for u-blox NEO-M8P-2. This image contains support for base station operation and must only be uploaded to NEO-M8P-2 modules.	
File	UBX_M8_301_HPG_100_REFERENCE.dd38fd00c1d64d05d5b458d8a8fa4b41.bin
FW ID String	EXT CORE 3.01 (111160) HPG 1.00
ROM base support	2.01, 3.01

See section 4 to learn how boot screen messages can be used to determine whether the NEO-M8P module is the NEO-M8P-2 or the NEO-M8P-0 variant.

1.3 Released documentation

Receiver Description / Protocol Specification:

Content	**Document No.**
u-blox 8 / u-blox M8 Receiver Description Including Protocol Specification	UBX-13003221
u-blox 8 / u-blox M8 Protocol Specification Addendum for HPG1.00	UBX-16004304
NEO-M8P u-blox M8 high precision GNSS modules Data Sheet	UBX-15016656

1.4 Released software tools

The tools listed in this section are required to re-program (Flash) a module running the 3.01 HPG 1.00 firmware. For each tool, the minimum version number is listed.

1.4.1 u-center

u-center version 8.21_beta02 and later should be used together with this firmware.

1.4.2 Firmware update tool

The firmware update utility tool v2.01 supports this product.

1.4.3 USB drivers

- u-blox GNSS Standard Driver for Windows (CDC-ACM) v1.2.0.8
- u-blox GNSS Sensor Device Driver for Windows v2.24

The latest drivers are available from the Product Resources section of the u-blox website http://www.u-blox.com

1.5 USB identification u-blox M8

Vendor ID:	0x1546
Product ID:	0x01A8
Driver String:	`u-blox GNSS receiver`

2 New and Modified Protocol Messages

2.1 New UBX Protocol Messages

Message	Remark
UBX-CFG-TMODE3	Configures the reference station mode (Time mode)
UBX-NAV-RELPOSNED	Relative Position Information in a NED frame
UBX-NAV-SVIN	Survey in data

2.2 Modified UBX Protocol Messages

Message	Remark
UBX-NAV-SAT	New flags to indicate that advanced corrections are applied for the satellite
UBX-NAV-PVT	Status flags to indicate new navigation modes
UBX-CFG-PRT	Support for RTCM 3 messages

2.3 Modified NMEA Protocol Messages

According to the NMEA standard, a number of standard messages hold a status indicator to indicate that the receiver is in an RTK float or RTK fixed navigation mode. The table below lists NMEA messages where Position Fix Flag statuses have changed.

Message	Remark
GGA	The *quality* field reports RTK fixed and RTK float navigation mode
GNS	The *posMode* field reports RTK fixed and RTK float navigation mode
RMC	The *status* field reports RTK fixed and RTK float navigation mode
GLL and VTG	The *posMode* field reports that differential corrections have been applied, which in this firmware indicates that the receiver is operating either in RTK fixed or in RTK float navigation mode

2.4 New RTCM Protocol Messages

See the *u-blox 8 / u-blox M8 Protocol Specification Addendum for HPG1.00* (document number UBX-16004304) for details on supported RTCM messages.

3 Features

3.1 HPG Features

The following high precision GNSS (HPG features are supported in the released firmware:

- L1 RTK for GPS and GLONASS
- RTCM v3.2 support as detailed in the data sheet (including MSM messages)
- 2 Hz navigation rate and 10 Hz raw data rate
- Base Station functionality with support for fixed position and survey-in mode.

3.2 SPG Features

The following standard precision features delivered by SPG FW3.01 **are** supported in the released 3.01 HPG 1.00 firmware:

- Time pulse
- AssitNow online
- Spoofing detection
- Geofencing
- Host interface Signature Description
- Raw GNSS data output

The following standard precision features delivered by SPG FW3.01 **are not** supported in the released 3.01 HPG 1.00 firmware:

- BeiDou
- Galileo
- IMES
- QZSS
- SBAS
- PPP
- High Navigation Rate
- Power Save Mode
- Map Matching
- Sensor Fusion Dead Reckoning
- AssistNow Offline
- AssistNow Autonomous
- RTCM2
- DGPS

The number of TRK channels is limited to 30 and NAV channels is limited to 20.

3.2.1 Week number rollover

The week number rollover is set to 1867 (October 2015). For test purposes (e.g. with historical simulations) the week number rollover can be adjusted in message UBX-CFG-NAVX5.

Please refer to other released documentation for detailed descriptions of the above features.

4 Notes and Limitations

4.1 Firmware

The flash firmware 3.01 HPG 1.00 has the following known limitations:

- The user will not receive a UBX-ACK-NACK message when trying to configure the rover firmware (NEO-M8P-0) to output RTCM messages even though this feature is only supported by the NEO-M8P-2 firmware.
- It is not possible to determine if the firmware holds Base Station functionality, i.e. if it is a NEO-M8P-0 or a NEO-M8P-2 module, using UBX-MON-VER. This can be determined by checking the LLC string in the boot screen. For NEO-M8P-0 the LLC string will be one of these:
  - FFFFFFFF-FFFFFFED-FFFFFFFF-FFFFF**F9E**-FFFFFF69
  - FFFFFFFF-FFFFFFFF-FFFFFFFF-FFFFF**F9E**-FFFFFFFD

  For NEO-M8P-2 the LLC string will be one of these:
  - FFFFFFFF-FFFFFFED-FFFFFFFF-FFFFF**79E**-FFFFFF69
  - FFFFFFFF-FFFFFFFF-FFFFFFFF-FFFFF**79E**-FFFFFFFD
- In the NMEA-GNS message, the position mode flags are set to RR for GPS and GLONASS even though GLONASS ambiguities are kept as float solutions.
- The accuracy of the velocity estimate is under review.
- The reliability of estimated position accuracy cannot be guaranteed at this stage.
- When estimating rover position, undifferenced and differenced measurements are not mixed. Hence, poor visibility at the Base Station can lead to degraded rover performance.

4.2 Software Tools

u-center version 8.21_beta02 has the following known limitations:

- It is not possible using UBX-CFG-PRT to select only RTCM3 as the desired input or output protocol, only the combination UBX+NMEA+RTCM3.