Public Release Notes

Topic :	**u-blox M8 Flash Firmware 3.01 HPG 1.20**
	UBX-16024900
Author :	Mårten Ström
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The released firmware, u-blox M8 Flash Firmware 3.01 HPG 1.20, is ONLY for High Precision GNSS products, NEO-M8P and C94-M8P. It must not be used for Standard Precision GNSS, Timing or Dead Reckoning products.

1 General Information

The released firmware described in this document operates with u-blox NEO-M8P-0 and NEO-M8P-2 modules.

The released firmware, u-blox M8 Flash Firmware 3.01 HPG 1.20, is ONLY for High Precision GNSS products, NEO-M8P and C94-M8P. It must not be used for Standard Precision GNSS, Timing or Dead Reckoning products.

1.1 Scope

This release note describes u-blox M8 firmware 3.01 HPG 1.20. The document covers the changes compared to u-blox flash firmware 3.01 HPG 1.11.

Please refer to release note for u-blox M8 firmware 3.01 HPG 1.11 (UBX-16011964) for changes compared to u-blox M8 firmware 3.01 HPG 1.00.

Please refer to release note for u-blox M8 firmware 3.01 HPG 1.00 (UBX-16005104) for changes compared to u-blox M8 firmware 3.01.

1.2 Released firmware images

Flash image for u-blox NEO-M8P-0. **This image contains support for rover operation.**	
File	UBX_M8_301_HPG_120_ROVER_NEOM8P0.4907a123de57e58f5c6b04d583645f06.bin
FW ID String	EXT CORE 3.01 (d34ed4) HPG 1.20ROV
ROM base support	2.01, 3.01

Flash image for u-blox NEO-M8P-2 and C94-M8P. **This image contains support for base station operation and must only be uploaded to NEO-M8P-2 modules. This image is intended to the application board C94-M8P.**	
File	UBX_M8_301_HPG_120_REFERENCE_NEOM8P2.25c928acde732c153890bf47a6f97f89.bin
FW ID String	EXT CORE 3.01 (d34ed4) HPG 1.20REF
ROM base support	2.01, 3.01

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 HPG1.20	UBX-16004304
NEO-M8P u-blox M8 high precision GNSS modules Data Sheet	UBX-15016656
Public Release Notes, u-blox M8 Flash Firmware 3.01 HPG 1.11	UBX-16011964
Public Release Notes, u-blox M8 Flash Firmware 3.01 HPG 1.00	UBX-16005104

1.4 Released software tools

1.4.1 u-center

u-center version 8.23 and later should be used together with this firmware. This software is available for downloading from u-blox website https://www.u-blox.com/en/evaluation-software-and-tools.

1.4.2 Firmware update tool

The firmware update utility tool v2.01 (or higher) supports this product and can be used to re-program (Flash) a NEO-M8P module running u-blox M8 Flash Firmware 3.01 HPG 1.00 or u-blox M8 Flash Firmware 3.01 HPG 1.11.

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 Firmware

This section describes the details of new features and modified messages introduced in u-blox M8 firmware 3.01 HPG 1.20.

2.1 New features

The following sections list the new features introduced in this firmware release.

2.1.1 Standard features

- QZSS (tracking only to avoid cross-correlation problems in Asia; transparent to the user)
- Support the output of time validity confirmation in UBX-NAV-PVT

2.1.2 RTK features

- Warning against invalid reference station position (entered directly or moved after survey-in completed). The reference solution is deemed invalid if the offset between the position stored in the receiver and the position computed using a simple least-square solution exceed the 3-sigma of the computed solution.
- Virtual reference station. A new noise model (extended baseline) has been added to support the case where corrections are generated by a network of reference stations. TTFAF and position accuracy performance typically are not as good as for a local reference station.

2.2 New and Modified Messages

The following sections list new messages introduced and modified messages in FW 3.01 HPG 1.20.

2.2.1 New Messages

None.

2.2.2 Modified Messages

Message	Description / Comment
UBX-NAV-STATUS	Renamed dgpsIStat to diffCorr
UBX-MON-VER	The FWVER will indicate if the firmware is a reference (“REF”) or a rover (“ROV”).

2.3 Improved Performance

The following sections list major performance improvements in FW 3.01 HPG 1.20.

2.3.1 Velocity and heading estimation

- The velocity estimate has been modified to remove the velocity spikes that could occur during transition between float/fixed RTK modes. This modification also improves the heading information during such transitions.
- The velocity estimate has been modified to better account for the dynamic model selected by the user and to enable the generation of instantaneous velocity estimates for platforms with high dynamics. The heading information also benefits from this improvement.

2.3.2 RTK

- The robustness of the ambiguity estimation has been improved. The receiver is now able to maintain an RTK fixed status even when minor signal degradations occur (e.g. partial blockage due to trees).

2.4 Modified behavior

2.4.1 Reference station

- The default dynamic model for the reference is no longer static but portable. It will switch to static upon receiving a UBX-CFG-TMODE3 message setting the mode to survey-in or fixed position.
- When a reference station is configured to perform a survey-in, it will start outputting RTCM observation messages (e.g. 1077, 1087 or 1127) right away, but will wait until the survey successfully completes before outputting the reference station message (more consistent with moving baseline behavior).
- When a survey-in command is received, any fixed position stored in the NVS will be discarded.

2.5 Known limitations

2.5.1 Firmware

The flash firmware 3.01 HPG 1.20 has the following known limitations:

- 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 communication port used for correction messages should be dedicated to RTCM to secure best performance and other messages (NMEA, UBX) should be put on other ports.
- When estimating rover position, un-differenced and differenced range measurements are not mixed. Hence, poor visibility at the Base Station can lead to degraded rover performance.
- The estimated position accuracy is too optimistic during the convergence phase.