

Release note

Topic u-blox F10 firmware SPG 6.00 release note
UBXDOC-963802114-12318 C1-Public
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1 General information

1.1 Scope

This release note applies to u-blox F10 firmware version SPG 6.00.

1.2 Open-Source declaration

This u-blox positioning product described in this release note, comprising the company's proprietary software, does not contain open-source software to declare.

1.2 Related documentation

- [1] u-blox F10 SPG 6.00 Interface description, [UBXDOC-963802114-8787](#)
- [2] u-blox GPS L5 configuration application note, [UBX-21038688](#)

2 Released firmware image

2.1 External SPG 6.00 image

Released firmware image	
File	EI_EIP_ROX_SPG600.ed8d4aee76215da21b8aa5625a86e78d.bin
Firmware version	EXT SPGL1L5 6.00 (041e8a) FWVER=SPGL1L5 6.00
Protocol version	PROTVR=40.00
ROM base support	ROM 2.00 – ROM BASE 0x6C1C37B0

The image can be used as external image stored on flash or downloaded to the on-device RAM at every startup.

2.2 ROM SPG 6.00 image

Released firmware image	
Firmware version	ROM SPGL1L5 6.00 FWVER=SPGL1L5 6.00
Protocol version	PROTVR=40.00
ROM base support	n.a.

2.3 Related software

Latest version of u-center 2 should be used with this firmware (23.07.66910 or later).

2.4 Identification

The receiver shall output a similar boot screen to the following one, with the differences expected in the CHIPID=... row (this is meant to be unique for every chip).

```
$GNTXT,01,01,02,u-blox AG - www.u-blox.com*4E
$GNTXT,01,01,02,HW UBX 10 000A0000*53
$GNTXT,01,01,02,EXT SPGL1L5 6.00 (041e8a)*6A
$GNTXT,01,01,02,ROM BASE 0x6C1C37B0*2F
$GNTXT,01,01,02,FWVER=SPGL1L5 6.00*46
$GNTXT,01,01,02,PROTVER=40.00*1C
$GNTXT,01,01,02,CHIPID=000000D7D59A0F7A54*0A
$GNTXT,01,01,02,GPS;GAL;BDS*08
$GNTXT,01,01,02,SBAS;QZSS*60
$GNTXT,01,01,02,NAVIC*00
$GNTXT,01,01,02,ANTSUPERV=*22
$GNTXT,01,01,02,ANTSTATUS=DONTKNOW*2D
$GNTXT,01,01,02,PF=F7FFF*4F
$GNTXT,01,01,02,Starting GNSS*5A
```

3 Changes compared to ROM firmware SPG 5.10

3.1 Added features

3.1.1 L1/L5 Dual-band operation

The SPG 6.00 firmware supports L1/L5 dual-band operation whereas the SPG 5.10 ROM firmware supports the L1 band operation only.

3.1.2 NavIC L5 signal support

The SPG 6.00 firmware supports the NavIC GNSS constellation in L5 band operation if enabled together with GPS, Galileo or Beidou.

3.1.3 Separate internal LNA control for L1 and L5 bands

The SPG 6.00 allows to set the gain for the chip-internal low noise amplifier (LNA) for the L1 and L5 bands separately.

3.1.4 Improved Hotstart TTFF without RTC

Faster time to first fix (TTFF) can be achieved with firmware SPG 6.00 in case a backup domain is supplied, but no RTC is connected to the GNSS.

3.1.5 Satellite masking

New configuration item CFG-NAVMASK-SV_MASK_XXX allows blocking of certain satellites for navigation that are known to introduce signal distortions such as multi-path.

Recommended to be used for receivers that are stationary.

3.1.6 System performance monitor

New message UBX-MON-SYS informs about CPU, memory and IO usage and other system parameters for monitoring or debugging purpose.

3.1.7 BDSBAS

The firmware can be configured to use BDSBAS signals.

The required configuration items of the CFG-SBAS configuration group and the steps to enable these signals in the receiver are described in the interface description and integration manual.

3.2 Changed features

3.2.1 Improved reporting of signal security information

Two new messages (UBX-SEC-SIG and UBX-SEC-SIGLOG) are introduced to give detailed status information about signal security (jamming, spoofing).

UBX-SEC-SIG summarizes the current state of jamming and spoofing detection.

UBX-SEC-SIGLOG provides a log of past signal security related events providing the type of event, start and stop timestamp.

3.2.2 Time pulse

New configuration item CFG-TP-DRSTR_TP1 allows to configure the drive strength for the Time Pulse pin 1 (TP1) output.

3.2.3 Improved QZSS cold start sensitivity

In firmware SPG 6.00 the QZSS cold start sensitivity improved by > 4 dB compared to SPG 5.10 ROM firmware.

3.3 Removed features

3.3.1 Single band operation

Single band signal configuration (L1 band only or L5 band only) is not supported. The SPG 6.00 firmware however supports enabling/disabling every single supported GNSS constellation.

3.3.2 GLONASS system

The SPG 6.00 firmware supports the global GNSS constellations GPS, Galileo and Beidou in concurrent L1/L5 dual-band operation. GLONASS signals are not available on the L5 band and is therefore not supported.

3.3.3 Power saving modes PSMCT, PSMOO

The firmware SPG 6.00 provides outstanding position accuracy in multipath environment like urban areas. This contradicts with cyclic tracking power modes and therefore the managed PSMCT and PSMOO power save modes are not supported.

Software standby mode and hardware backup mode is supported.

3.3.4 Data batching

This feature minimizes power consumption for single band GNSS products and is therefore not supported.

3.3.5 CloudLocate

This feature minimizes power consumption for single band GNSS products and is therefore not supported.

4 Message interface

4.1 NMEA

The default NMEA version is 4.11. In firmware SPG 6.00 there are no changes related to NMEA protocol compared to firmware SPG 5.10.

4.2 UBX

This firmware supports the UBX protocol version 40.00.

4.2.1 New UBX messages

Message	Description/Comment
UBX-MON-SYS	Current system performance information for monitoring purposes
UBX-SEC-SIG	Signal security information
UBX-SEC-SIGLOG	Signal security log
UBX-NAV-TIMENAVIC	NavIC time solution

4.2.2 Changed UBX messages

Message	Description/Comment
UBX-NAV-PL	Three new fields added to indicate the reason why protection level is marked as invalid for position/velocity/time.

4.2.3 Deprecated UBX messages

The UBX messages listed below are deprecated and are planned to be removed in future firmware versions. These are all related to the legacy configuration commands that have been replaced by the new method that uses the generic UBX-CFG-VALSET message to set configuration item values. For more details on the new configuration scheme, refer to [1].

Message	Description/Comment
UBX-CFG-ANT	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-CFG	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-DAT	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-INF	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-ITFM	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-MSG	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-NAV5	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-NAVX5	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-NMEA	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-ODO	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-PRT	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-RATE	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-RINV	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-SBAS	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-TP5	Legacy configuration command, replaced by UBX-CFG-VALSET command
UBX-CFG-PWR	Legacy configuration command, replaced by UBX-CFG-VALSET command

4.2.4 Removed UBX messages

Message	Description/Comment
UBX-RXM-MEASxxx CFG-MNP-xxx	These messages are related to the CloudLocate feature which is not supported
UBX-NAV-TIMEGLO	This GLONASS specific message is removed as GLONASS is not supported
UBX-LOG-BATCH, UBX-LOG-RETRIEVEBATCH, UBX-CFG_BATCH	These messages are related to the data batching feature which is not supported
UBX-CFG-PM2, UBX-CFG-PMS, UBX-CFG-RXM, UBX-CFG-DGNSS, UBX-CFG-GEOFENCE, UBX-CFG-LOGFILTER, UBX-CFG-DGNSS	Legacy configuration messages that are related to power saving modes or other features that are not supported

4.3 Changes in configuration keys

4.3.1 New configuration keys

Key	Description/Comment
CFG-NAVSPG-PL_ENA	Controls whether UBX-NAV-PL messages are output or not.
CFG-NAVMASK-SV_MASK_GPS	Satellite mask for the GPS system
CFG-NAVMASK-SV_MASK_GAL	Satellite mask for the Galileo system
CFG-NAVMASK-SV_MASK_BDS	Satellite mask for the BeiDou system
CFG-NAVMASK-SV_MASK_QZSS	Satellite mask for the QZSS system
CFG-NAVMASK-SV_MASK_NAVIC	Satellite mask for the NavIC system
CFG-TP-DRSTR_TP1	Configures drive strength for Time Pulse pin 1 (TP1) output. Possible options: 2, 4, 8 and 12 mA
CFG-NMEA-FILT_NAVIC	Disable reporting of NavIC satellites
CFG-SBAS-ACCEPT_NOT_IN_PRNMASK	Accept corrections from SBAS SV, even if not self included in PRN MASK (Message Type 1)

4.3.2 Modified configuration keys

Key	Description/Comment
CFG-QZSS-SLAS_MAX_BASELINE	Defines the maximum distance from closest ground monitoring stations where QZSS SLAS corrections will be applied. The default value of this parameter has changed from 200km to 350km.
CFG-HW-RF_LNA_MODE	Sets the gain mode of the chip internal LNA for the L1 and L5 band independently of each other.

4.3.3 Removed configuration keys

Key	Description/Comment
CFG-NMEA-FILT_GLO	Removed as GLONASS is not supported.
CFG-BATCH-xxx	All data batching related config keys removed as the feature is not supported.
CFG-PM-xxx	All power management config keys removed as the power saving modes are not supported.

5 Known limitations and issues

5.1 Acquisition and tracking

- Writing Earth orientation parameters (EOP) assistance data with the UBX-MGA-DBD message will always result in a “NAK” response from the GNSS receiver.
Workaround: Use UBX-MGA-INI-EOP message to write EOP assistance data.

5.2 Navigation

- Protection Level (PL): The misleading information (MI) target rate of 5% as given in UBX-NAV-PL message has been verified only with 1 Hz navigation rate.
Workaround: Accept a risk of a higher MI rate for navigation rates other than 1 Hz.