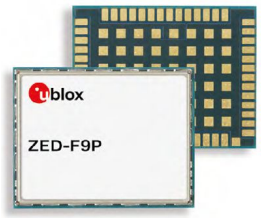
ZED-F9P FW 1.00 HPG L1L5 1.40

ZED-F9P

Release Note



Abstract
This document contains general information, interface changes and firmware changes (features, improvements), along with known limitations for ZED-F9P FW 1.00 HPG L1L5 1.40.

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Contents

1 General information

1.1 Scope

This Release Note applies to ZED-F9P with Firmware 1.00 HPG L1L5 1.40.

The document covers the changes in the ZED-F9P firmware compared to firmware version FW 1.00 HPG 1.32. Please refer to u-blox ZED-F9P Release Note FW 1.00 HPG 1.32 for a full description.

1.2 Released firmware image

File	UBX_F9_100_HPGL1L5_140_F9P.a953bd2d71061ed21cc6fdc431ab39a5.bin
Firmware version	EXT CORE 1.00 (8d3640) FWVER=HPGL1L5 1.40
ROM base support	ROM 1.02 - ROM BASE 0x118B2060 ROM 1.01 - ROM BASE 0xDD3FE36C ROM 0.40 - ROM BASE 0xCAAF619C

Table 1: Released firmware image for u-blox ZED-F9P

1.3 Related software

Version 23.05 (or later) of u-center GNSS evaluation software is recommended for use with the released firmware. Please contact FAE if this version is not available on the official web site.

1.4 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.

1.5 Related documents

[1] HPG L1L5 1.40 Interface description, UBX-23006991
[2] ZED-F9P-15B Data sheet, UBX-23009090
[3] ZED-F9P Integration manual, UBX-18010802
[4] ZED-F9P Release note FW 1.00 HPG 1.32, UBX-22004887

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2 Firmware description

This section highlights selected features supported by this firmware.

- The firmware image contains multi-band (L1/L5) RTK rover using all major GNSS constellations.
- The firmware image supports raw code and carrier phase measurement output for all supported GNSS signals.

2.1 Supported GNSS constellations and signals

- GPS: L1C/A, L5
- GLONASS: L1OF
- Galileo: E1B/C, E5a
- BeiDou: B1I, B2a
- QZSS: L1C/A, L5
- NavIC: L5

All signals are enabled in the default configuration, except GPS L5 and NavIC L5.

2.2 High precision GNSS features

- RTK rover receiver features:
  - High precision RTK fixed navigation using multi-band, multi-constellation GNSS
  - RTCM input support (details below), supporting Network RTK (VRS) and local base stations, e.g. another NEO-F9P or ZED-F9P module
  - SPARTN input support for GPS, GLONASS, Galileo and Beidou with fast reconvergence time
  - CLAS input support for QZSS
    - The CLAS augmentation service is broadcasted by a QZSS L6 signal which is not part of the frequency range covered by ZED-F9P. As such, ZED-F9P does not support receiving, demodulating and decoding of the QZSS L6 signal. This is supported by NEO-D9C which then must pass the correction stream to ZED-F9P in the form of UBX-RXM-QZSSL6 messages. This enables the ZED-F9P to directly use these messages and extract the compact SSR (cSSR) formatted corrections in order to use them directly without further processing or reformatting by an intermediary.
    - At the time of this release note, a CLAS solution with ZED-F9P augments GPS L1C/A L5, and Galileo E5a and E1 B/C
  - SBAS
- RTK reference receiver features:
  - Fixed position mode and Survey-in mode
  - Output RTCM standard format
- Raw measurements:
  - Multi-band, multi-GNSS raw measurement data output (UBX-RXM-RAWX)
  - Navigation data subframe output (UBX-RXM-SFRBX)
- Support of active antennas
- UBX messages on all interfaces
- Protection Level output to indicate level of trust in position output
- Secondary standard precision GNSS output in addition to RTK output
- Jamming detector with logging
- Embedded spectrum analyzer to visualize in-band noise sources

- Direct physical connection with L-band receiver
- Option to use GPS L5 signals

3 Message interface

The message interface is described in the ZED-F9P FW 1.00 HPG L1L5 1.40 Interface description, UBX-23006991. The released firmware supports UBX protocol version 27.40.

3.1 UBX

The ZED-F9P relies exclusively on the configuration interface using the UBX-CFG-VALSET, UBX-CFG_VALGET and UBX-CFG-VALDEL. Although some undocumented legacy UBX-CFG-* messages are functional, users are strongly discouraged from using these deprecated messages.

The protocol is completely documented in the Interface description.

3.2 NMEA

ZED-F9P FW 1.00 HPG L1L5 1.40 supports up to NMEA protocol version 4.11.

Five NMEA standards are supported. The default NMEA version is 4.11, and, alternatively, versions 4.10, 4.0, 2.3, and 2.1 can be enabled.

3.3 RTCM

ZED-F9P FW 1.00 HPG L1L5 1.40 supports up to RTCM3 standard version 3.3.

3.4 SPARTN

ZED-F9P FW 1.00 HPG L1L5 1.40 supports up to SPARTN protocol version 2.0.1.

3.5 Interface changes

☞ Interfaces changes are comparing HPG1.32 to this version.

3.5.1 New

Message / Configuration item	Description / Comment
CFG-HW-ANT_ON_SHORT_US	Delay in microseconds between turning the antenna power supply on and enabling the antenna short circuit detection.
CFG-MSGOUT-UBX_NAV2_TIMENAVIC_I2C CFG-MSGOUT-UBX_NAV2_TIMENAVIC_SPI CFG-MSGOUT-UBX_NAV2_TIMENAVIC_UART1 CFG-MSGOUT-UBX_NAV2_TIMENAVIC_UART2 CFG-MSGOUT-UBX_NAV2_TIMENAVIC_USB	Output rate of the UBX-NAV2-TIMENAVIC message on port I2C/SPI/UART1/UART2/USB

Message / Configuration item	Description / Comment
CFG-MSGOUT-UBX_NAV_TIMENAVIC_I2C CFG-MSGOUT-UBX_NAV_TIMENAVIC_SPI CFG-MSGOUT-UBX_NAV_TIMENAVIC_UART1 CFG-MSGOUT-UBX_NAV_TIMENAVIC_UART2 CFG-MSGOUT-UBX_NAV_TIMENAVIC_USB	Output rate of the UBX-NAV-TIMENAVIC message on port I2C/SPI/UART1/UART2/USB
CFG-MSGOUT-UBX_SEC_SIGLOG_I2C CFG-MSGOUT-UBX_SEC_SIGLOG_SPI CFG-MSGOUT-UBX_SEC_SIGLOG_UART1 CFG-MSGOUT-UBX_SEC_SIGLOG_UART2 CFG-MSGOUT-UBX_SEC_SIGLOG_USB	Output rate of the UBX-SEC-SIGLOG message on port I2C/SPI/UART1/UART2/USB
CFG-MSGOUT-UBX_SEC_SIG_I2C CFG-MSGOUT-UBX_SEC_SIG_SPI CFG-MSGOUT-UBX_SEC_SIG_UART1 CFG-MSGOUT-UBX_SEC_SIG_UART2 CFG-MSGOUT-UBX_SEC_SIG_USB	Output rate of the UBX-SEC-SIG message on port I2C/SPI/UART1/UART2/USB
CFG-NMEA-FILT_NAVIC	Disable reporting of NavIC satellites. Default value is false.
CFG-SEC-JAMDET_SENSITIVITY_HI	When set, go for a more sensitive jamming detection (at the cost of increased false alarm rate)
CFG-SBAS-ACCEPT_NOT_IN_PRNMASK	Accept corrections from SBAS SV, even if not self included in PRN MASK (Message Type 1)
CFG-SIGNAL-BDS_B2A_ENA	BeiDou B2a enable. Enabled by default.
CFG-SIGNAL-GAL_E5A_ENA	Galileo E5a enable. Enabled by default.
CFG-SIGNAL-GPS_L5_ENA	GPS L5 enable. Disabled by default.
CFG-SIGNAL-NAVIC_ENA	NavIC enable. Disabled by default.
CFG-SIGNAL-NAVIC_L5_ENA	NavIC L5 enable. Disabled by default.
CFG-SIGNAL-QZSS_L5_ENA	QZSS L5 enable. Enabled by default.
SPARTN-1X-HPAC_BDS	BeiDou high-precision atmosphere correction (HPAC)
SPARTN-1X-OCB_BDS	BeiDou orbit, clock, bias (OCB)
UBX-SEC-SIG	Signal security information
UBX-SEC-SIGLOG	Signal security log

3.5.2 Modified

Message / Configuration item	Description / Comment
UBX-NAV-PL	Message now reports invalidity reasons for position, velocity and time protection levels
UBX-RXM-SPARTNKEY	When the receiver accepts a valid message, it sends a UBX-RXM-SPARTNKEY-POLL message back to the caller, to indicate success.

Message / Configuration item	Description / Comment
CFG-NAVSPG-WKNROLLOVER	Updated from 2208 to 2265

3.5.3 Removed

Message / Configuration item	Description / Comment
UBX-CFG-ITFM CFG-ITFM-ENABLE CFG-ITFM-ENABLE_AUX CFG-ITFM-CWTHRESHOLD CFG-ITFM-ANTSETTING CFG-ITFM-BBTHRESHOLD	Jamming/interference monitor configuration
CFG-SIGNAL-BDS_B2_ENA CFG-SIGNAL-GAL_E5B_ENA CFG-SIGNAL-GLO_L2_ENA CFG-SIGNAL-GPS_L2C_ENA CFG-SIGNAL-QZSS_L2C_ENA	Not supported by L1L5 firmare
RTCM-3X-TYPE4072_0 RTCM-3X-TYPE4072_1 CFG-MSGOUT-RTCM_3X_TYPE4072_0_I2C CFG-MSGOUT-RTCM_3X_TYPE4072_0_SPI CFG-MSGOUT-RTCM_3X_TYPE4072_0_UART1 CFG-MSGOUT-RTCM_3X_TYPE4072_0_UART2 CFG-MSGOUT-RTCM_3X_TYPE4072_0_USB CFG-MSGOUT-RTCM_3X_TYPE4072_1_I2C CFG-MSGOUT-RTCM_3X_TYPE4072_1_SPI CFG-MSGOUT-RTCM_3X_TYPE4072_1_UART1 CFG-MSGOUT-RTCM_3X_TYPE4072_1_UART2 CFG-MSGOUT-RTCM_3X_TYPE4072_1_USB	HPG L1L5 1.40 does not support moving baseline feature.

4 Improvements

- UBX-RXM-COR reports correctly when SPARTN correction sourse is set to LBAND
- UBX-RXM-COR and UBX-RXM-SPARTN messages get output for encrypted SPARTN protocol corrections, while the configuration item CFG-SPARTN-USE_SOURCE is set to IP and no valid key is available in UBX-RXM-SPARTNKEY
- Encrypted SPARTN protocol corrections received on UART2 are reported as SPARTN input in UBX-MON-COMMS and UBX-MON-MSGPP, while the configuration item CFG-SPARTN-USE_SOURCE is set to IP and no valid key is available in UBX-RXM-SPARTNKEY
- E5a signals are output in GxGSV or GxGRS NMEA messages
- UBX-MON-RF repeated block updated to match documentation in Interface Description
- SPARTN keys switch to next one works even if “valid from ToW” (i.e. start of the week) value is zero
- PointPerfect keys switch correctly if the server is sending messages with GLONASS timetags. This fixes an issue in previous ZED-F9P firmware release (HPG 1.32) causing the key switch to happen 3 hours too early when the PointPerfect service sends a stream with GLONASS messages. This had the consequence of a 3 hour window where the decrypted messages were invalid.
- Improved the robustness of the recovery mechanism of the antenna supervisor
- Improved fixing rate with CLAS corrections
- Increased robustness of receiving SBAS corrections
- Improved UBX-INF-ERROR message reporting on UART2 interface
- Static hold mode works reliably also with navigation rates higher than 1 Hz
- Improved SPI robustness with large messages
- Enabled BDS satellites 38 to 58 for HPG processing

5 Known limitations

- A receiver moving at very slow speed (less than 10 cm/s) does not update the heading information in UBX-NAV-PVT. The velocity vectors can be used reliably.
- Geofence status pin must not be re-assigned to another pin
- If the receiver is configured to output RTCM messages on several ports, the ports must have the same RTCM configuration, otherwise the MSM multiple message bit might not be set correctly
- Time pulse can only be synced to GNSS. Configuration items and relevant flag cannot be set to false (CFG-TP-SYNC_GNSS_TP1, UBX-CFG-TP5)