

Release note

Topic HDG 2.00 firmware for ZED-X20D-00B
UBXDOC-304424225-21402 C1-Public

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1 General information

1.1 Scope

This release note applies to the u-blox HDG 2.00 firmware version for the ZED-X20D-00B heading module.

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.

1.3 Related documentation

- [1] ZED-X20D Data sheet, [UBXDOC-304424225-20103](#)
- [2] ZED-X20D Integration manual, [UBXDOC-304424225-21476](#)
- [3] [u-blox X20 HDG 2.00 Interface description](#), [UBXDOC-304424225-21470](#)
- [4] u-blox EVK-X20D user guide, [UBXDOC-304424225-21353](#)
- [5] u-center 2 GNSS evaluation software for Windows, version 26.05.3 or later version, <https://www.u-blox.com/en/u-center-2>
- [6] u-blox GPS L5 configuration Application note, [UBX-21038688](#)

2 Released firmware image

Released firmware image	Audience
File	UBX_20_HDG200.03ee8bd9a768c70e2a25f8bb4db5a0b8.bin
Firmware version	EXT HDG 2.00 (14cdfd7) FWVER=HDG 2.00
Protocol version	57.02
ROM base support	ROM BASE 0x00A9D329

2.1 Released software tools

2.1.1 u-center 2

Use u-center 2 version 26.05.3 or later with the ZED-X20D HDG 2.00 firmware.

3 Firmware description

The key features supported by HDG 2.00 are:

- High precision positioning output (PVT, as in ZED-X20P)
- Dual all-band antenna support
- Dual output of raw code and carrier phase measurement for all supported GNSS signals
- Dual-antenna, all-band high-precision GNSS-based heading solution
- RTK, PPP-RTK and PPP functionality
 - PointPerfect correction service
 - Galileo High Accuracy Service (HAS)

This firmware is only for the ZED-X20D dual-antenna heading module.

3.1 Supported GNSS signals

The HDG 2.00 firmware supports the following GNSS signals:

- GPS: L1C/A, L2C, L5
- BeiDou: B1I, B1C, B2a, B3I
- Galileo: E1B/C, E5a, E6
- GLONASS: L1OF, L2OF
- QZSS: L1C/A, L2C, L5
- NavIC: L5
- SBAS: L1C/A



Note that the GPS L5 signals are flagged as unhealthy at the time of this release. The receiver does not use unhealthy signals for navigation by default. See the GPS L5 configuration application note [5] for further details.



Regional constellations, such as QZSS and NavIC, are disabled by default. They can be enabled on demand.



GLONASS Geo-blocking feature: GLONASS is generally available, but restricted in some geographical areas.

3.2 GNSS and heading features

- Dual output of code and carrier phase measurements (UBX-RXM-RAWX)
- High precision heading (dual-antenna)
- AssistNow Live Orbits
- Geofencing with support for location restriction and anti-theft functionality through navigation messages
- Monitoring and management functions for embedded system health, including I/O queues, pin status, and correction status
- Personalization with individualized identity for access to high value features and subscriptions
- Hardware backup modes
- Anti-jamming capabilities, including RF interference and jamming detection and reporting
- Anti-spoofing capabilities, including spoofing detection and reporting
- Galileo Open Service Navigation Message Authentication (OSNMA)
- Configuration lockdown, allowing receiver configuration to be locked by command
- Secure boot, enabling execution of only signed firmware images
- Secure storage with tamper-resistant, end-to-end security
- RTK high-precision positioning
- PPP-RTK high-precision positioning
- PPP positioning solution using the Galileo High Accuracy Service

3.3 Message interface

For a detailed description of the message interfaces available for the ZED-X20D HDG 2.00 release, see the Interface description [3].

3.3.1 NMEA

The default NMEA version is 4.11. Alternatively, versions 4.10 and 4.0 can also be enabled.

3.3.1.1 New NMEA message

Message	Audience	Description /Comment
NMEA-Standard-THS	PUB	True heading and status. This message includes a Mode indicator field providing critical safety-related information about the heading data, replaces the HDT sentence.

3.3.2 UBX

This firmware supports the UBX protocol version 57.02. For further information, refer to the Interface description [3].

3.3.2.1 New UBX message

Message	Audience	Description /Comment
UBX-NAV-DAHEADING	PUB	Dual-antenna heading. This message contains relative position vector and heading from antenna 1 to antenna 2 of ZED-X20D, along with the corresponding accuracy figures. Configuration item CFG-NAVSPGDAHEADING_OFFSET allows the heading to represent the vehicle's forward direction instead of the antenna baseline.

3.3.2.2 Modified message

Message	Audience	Description /Comment
UBX-RXM-RAWX	PUB	Added new "msgSource" field in the variable section to denominate the source of the ZED-X20D RAWX message: from antenna 1 or 2.
UBX-MON-SPAN	PUB	Added new "msgSource" field in the variable section to denominate the source of the ZED-X20D SPAN message: from antenna 1 or 2.
UBX-MON-RF	PUB	Added new "msgSource" field in the variable section to denominate the source of the ZED-X20D RF message: from antenna 1 or 2.

3.3.3 RTCM

The released firmware supports the RTCM3 standard up to version 3.4.

3.3.4 SPARTN

The released firmware supports the SPARTN protocol up to version 2.0.2.

4 Known limitations

4.1 Interface

UART2 is an input-only interface that, with the HDG 2.00 firmware, supports the reception of RTCM and SPARTN correction data

4.2 SW backup

The SW backup feature is not functional with the HDG 2.00 firmware.

4.3 Update rate

ZED-X20D heading module supports dual-antenna. For optimal performance, the update rates on antenna 1 and antenna 2 should be identical. If the application requires the update rate to differ between antenna 1 and antenna 2, it is possible with technical support from u-blox*, but to ensure reliable performance, it is recommended to have antenna 1 update rate as an integer multiple of the antenna 2 update rate, as in the examples below:

- 20 Hz Navigation update rate at antenna 1, 10 Hz / 5 Hz heading at antenna 2
- 25 Hz Navigation update rate at antenna 1, 12.5 Hz / 5 Hz heading at antenna 2

** With the HDG 2.00 firmware, for further information and guideline about special configuration of update rate, contact u-blox local technical support.*

4.4 UBX-MON-* messages

Only the below UBX-MON messages have valid content for HDG 2.00 firmware:

- UBX-MON-VER
- UBX-MON-RF
- UBX-MON-SPAN
- UBX-MON-GNSS
- UBX-MON-PATCH

4.5 NMEA-TXT

Some NMEA-TXT information messages can be missing. UBX-INF messages can be used as a work-around.

4.6 Galileo

Galileo HAS and Galileo OSNMA cannot be enabled at the same time.