

# ZED-X20P series



## u-blox X20 all-band high precision GNSS module

### All-band GNSS receiver designed in Switzerland

- All-band all constellation GNSS receiver
- Best position accuracy and availability in different environments
- RTK, PPP-RTK and PPP algorithms expanding the limits of performance
- Highest quality GNSS raw data
- u-blox end-to-end hardened security



Standard

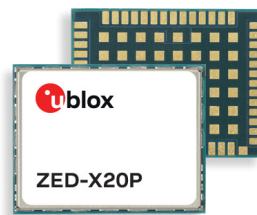


Professional



Automotive

17.0 × 22.0 × 2.4 mm



### Product description

The ZED-X20P module sets the standard in positioning performance and features for mass markets to protect your investments. It integrates all-band GNSS with signal modernization and innovative positioning algorithms using Real-time Kinematics (RTK), PPP-RTK, and Precise Point Positioning\* (PPP) technologies in a compact, energy-efficient form factor. As the most reliable position sensor from the most trusted name in GNSS, ZED-X20P ensures unparalleled reliability and performance.

ZED-X20P concurrently processes signals from the GPS, Galileo, BeiDou, QZSS, and NavIC constellations across all GNSS bands, including L-band. The highest level of integration on a single-chip receiver enables new system architectures and creates value for industrial navigation and robotics markets in products such as unmanned autonomous vehicles (UAVs), guidance systems, and auto-steering applications.

With its very high update rate, the ZED-X20P module is ideal for control applications, ensuring smooth and reliable operation. For advanced users, its pristine raw data features minimal cycle slips and exceptionally low noise in carrier range and pseudo-range measurements. ZED-X20P protects system integrity with multi-layered defenses, including a Root of Trust, jamming and spoofing detection, cryptographic authentication of navigation messages through Galileo OSNMA, and more. High-value, application-specific features such as moving baseline are also available.

The receiver enables easy integration, helping product developers bring their ideas to market quickly. ZED-X20P offers support for a range of correction services natively, striking the perfect balance between performance and data usage. It supports standard RTCM corrections for Virtual Reference Stations (VRS) in a Network RTK setup or a local base station setup. SPARTN-format SSR correction service broadcasts are also supported for mass-market applications, and direct reception of PPP global services simplifies deployments.

|                                   | ZED-X20P             |
|-----------------------------------|----------------------|
| <b>Grade</b>                      |                      |
| Automotive                        |                      |
| Professional                      | •                    |
| Standard                          |                      |
| <b>GNSS</b>                       |                      |
| GPS, SBAS                         | •                    |
| QZSS                              | •                    |
| Galileo                           | •                    |
| BeiDou                            | •                    |
| NavIC                             | •                    |
| All-band                          | L1/L2/L5/L6 + L-band |
| <b>Compatible u-blox services</b> |                      |
| AssistNow™                        | •                    |
| PointPerfect                      | •                    |
| <b>Interfaces</b>                 |                      |
| UART                              | 2                    |
| SPI                               | 1                    |
| DDC (I2C compliant)               | 1                    |
| <b>Features</b>                   |                      |
| Programmable (flash)              | •                    |
| Carrier phase output              | •                    |
| Additional SAW                    | •                    |
| RTC crystal                       | •                    |
| Oscillator                        | T                    |
| RTK rover                         | •                    |
| RTK base station                  | •                    |
| Moving base*                      | •                    |
| Timepulse                         | 1                    |
| <b>Power supply</b>               |                      |
| 2.7 V – 3.6 V                     | •                    |

T = TCXO



## Product performance and features

|                                |                                                                                                                                                                       |                    |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Receiver type                  | 672-channel u-blox X20 engine<br>GPS L1C/A, L2C, L5<br>GAL E1B/C, E5a, E6<br>BDS B1I, B1C, B2a, B3I<br>QZSS L1C/A, L1C/B*, L2C, L5, L6<br>NavIC L1*, L5<br>SBAS L1C/A |                    |
| Nav. update rate               | RTK                                                                                                                                                                   | up to 25 Hz        |
| Position accuracy <sup>1</sup> | RTK                                                                                                                                                                   | 0.01 m + 1 ppm CEP |
|                                | PPP*                                                                                                                                                                  | 0.10 m CEP         |
| Convergence time <sup>1</sup>  | RTK                                                                                                                                                                   | < 10 sec           |
|                                | PPP*                                                                                                                                                                  | < 120 sec          |
| Acquisition                    | Cold starts                                                                                                                                                           | 27 s               |
|                                | Aided starts                                                                                                                                                          | 2 s                |
|                                | Reacquisition                                                                                                                                                         | 2 s                |
|                                |                                                                                                                                                                       |                    |
| Sensitivity                    | Tracking & Nav.                                                                                                                                                       | -167 dBm           |
|                                | Cold starts                                                                                                                                                           | -148 dBm           |
|                                | Hot starts                                                                                                                                                            | -157 dBm           |
|                                | Reacquisition                                                                                                                                                         | -160 dBm           |
| Assistance                     | AssistNow Online<br>OMA SUPL & 3GPP compliant                                                                                                                         |                    |
| Oscillator                     | TCXO                                                                                                                                                                  |                    |
| RTC crystal                    | Built in                                                                                                                                                              |                    |
| Anti-jamming                   | CW detection                                                                                                                                                          |                    |
| Anti-spoofing                  | Advanced anti-spoofing algorithms and OSNMA                                                                                                                           |                    |
| Memory                         | Flash                                                                                                                                                                 |                    |
| Moving base*                   | For attitude sensing and heading applications                                                                                                                         |                    |
| Supported antennas             | Active                                                                                                                                                                |                    |

<sup>1</sup> Depends on atmospheric conditions, baseline length, GNSS antenna, multipath conditions, satellite visibility, and geometry

\* Feature in development

## Interfaces

|                   |                                                                                        |
|-------------------|----------------------------------------------------------------------------------------|
| Serial interfaces | 2 UART<br>1 SPI<br>1 DDC (I2C compliant)                                               |
| Digital I/O       | Configurable timepulse<br>EXTINT input for wakeup<br>RTK fix status<br>GEOFENCE status |
| Timepulse         | Configurable: 0.25 Hz to 10 MHz                                                        |
| Protocols         | NMEA, UBX binary, RTCM v. 3.4, SPARTN v. 2.0.2                                         |

## Package

|                                                |
|------------------------------------------------|
| 54-pin LGA (land grid array), 17 x 22 x 2.4 mm |
|------------------------------------------------|

## Environmental data, quality, and reliability

|                                                   |                                                                                   |
|---------------------------------------------------|-----------------------------------------------------------------------------------|
| Operating temp.                                   | -40 °C to +85 °C                                                                  |
| Storage temp.                                     | -40 °C to +85 °C                                                                  |
| Vibration                                         | MIL-STD-810G (Category 24, 7.7g RMS)                                              |
| Environmental grade                               | RoHS compliant (2015/863/EU)                                                      |
| Green (halogen-free)                              |                                                                                   |
| EU Radio Equipment Directive compliant 2014/53/EU |                                                                                   |
| Environmental testing                             | Qualified according to u-blox qualification policy, based on a subset of AEC-Q104 |
| Quality management                                | Manufactured and fully tested in ISO/TS 16949 certified production sites          |

## Electrical data

|                   |                                                 |
|-------------------|-------------------------------------------------|
| Supply voltage    | 2.7 V to 3.6 V                                  |
| Power consumption | 60 mA at 3.0 V (all constellations, continuous) |
| Backup supply     | 1.65 V to 3.6 V                                 |

## Compatible u-blox location services

|                   |                                                                    |
|-------------------|--------------------------------------------------------------------|
| Location services | AssistNow A-GNSS service<br>PointPerfect GNSS augmentation service |
|-------------------|--------------------------------------------------------------------|

## Support products

u-blox support products provide reference design, and allow efficient integration and evaluation of u-blox positioning technology.

|             |                                                           |
|-------------|-----------------------------------------------------------|
| EVK-X20P-00 | ZED-X20P-00B evaluation kit with ANN-MB2 antenna          |
| u-center 2  | Highly intuitive software for GNSS performance evaluation |
| ANN-MB2     | All-band high precision antenna                           |

## Product variants

|              |                                     |
|--------------|-------------------------------------|
| ZED-X20P-00B | All-band high precision GNSS module |
|--------------|-------------------------------------|

## Further information

For contact information, see [www.u-blox.com/contact-u-blox](http://www.u-blox.com/contact-u-blox).  
For more product details and ordering information, see the product data sheet.

## Legal Notice:

u-blox or third parties may hold intellectual property rights in the products, names, logos and designs included in this document. Copying, reproduction, or modification of this document or any part thereof is only permitted with the express written permission of u-blox. Disclosure to third parties is permitted for clearly public documents only.

The information contained herein is provided "as is". No warranty of any kind, either express or implied, is made in relation to the accuracy, reliability, fitness for a particular purpose, or content of this document. This document may be revised by u-blox at any time. For most recent documents and product statuses, please visit [www.u-blox.com](http://www.u-blox.com).