# RTK GPS (GNSS)

## Key B and E M.2 Card

**W230**

### Overview

The W230 is a tiny M.2 add-on module to provide very precise GNSS (GPS) localisation. It is based on the u-blox ZED-F9x modules.

The W230 is the industry first M.2 card with access to all interfaces: USB und 2x UART.



W230 with the ZED-F9P-04B u-blox RTK module

### Benefits of RTK

- Precise Positioning:
  Achieve centimeter-level positioning accuracy with fast convergence times (<10s) and reliable performance enabling precise navigation and tracking applications.
- Faster Time-to-First-Fix:
  Rapid initialization and convergence times ensure quicker availability of accurate positioning data, minimizing startup delays.
- Increased Data Quality:
  RTK enables high-quality data collection in a small and energy-efficient module, for applications such as surveying, mapping, precision agriculture, and autonomous vehicles.

### M.2 form factor

The M.2 card based RTK module brings simplicity and compactness. It simplifies integration, saves time, and reduces system complexity. The small size of the M.2 card allows for easy integration into space-constrained devices, making it versatile for various applications. Overall, it offers an efficient solution for precise positioning in compact systems.

### Technical Specifications

| Feature | W230-P | W230-R |
|---|---|---|
| **GNSS features** | | |
| u-blox module | ZED-F9P | ZED-F9R |
| GNSS | BeiDou, Galileo, GLONASS, GPS / QZSS | BeiDou, Galileo, GLONASS, GPS / QZSS |
| Number of concurrent GNSS | 4 | 4 |
| GNSS bands | GPS L1C/A L2C, GLO L1OF L2OF, GAL E1B/C, E5b, BDS B1I B2I, QZSS L1C/A L1S L2C L5, SBAS L1C/A | GPS L1C/A L2C, GLO L1OF L2OF, GAL E1B/C E5b, BDS B1I B2I, QZSS L1C/A L1S L2C |
| Multi-Band | L1/L2/L5 | ✓ |
| **Interfaces** | | |
| UART | 2 | 2 |
| USB | 1 | 1 |
| DDC (I2C compliant) | 1 | 1 |
| SPI | 1 | 1 |
| **Features** | | |
| Connector | M.2 key B & E | M.2 key B & E |
| Size [mm] | 22x42 | 22x42 |
| Operating temperature [°C] | -40 to 85 | -40 to 85 |
| Supply voltage [V] | 2.7 to 3.6 | 2.7 to 3.6 |
| Power consumption | 68 mA at 3.0 V | 85 mA at 3.0 V |
| Super cap | ✓ | ✓ |
| Cold start | 24 s | 24 s |
| Hot start | 2 s | 2 s |
| Navigation update rate | Up to 20 Hz | Up to 30 Hz |
| Position accuracy RTK | 0.01 m | <0.01 m |
| TCXO Oscillator | ✓ | ✓ |
| Active antenna / LNA control | ✓ | ✓ |
| Active antenna / LNA supply | ✓ | ✓ |
| Antenna open circuit detection pin | ✓ | ✓ |
| Antenna short circuit detect / protect pin | ✓ | ✓ |
| Base station with survey-in | ✓ | |
| Carrier phase output | ✓ | ✓ |
| Data logging | ✓ | |
| Jamming detection | ✓ | ✓ |
| Programmable flash memory | ✓ | ✓ |
| RTK rover | ✓ | ✓ |
| Secure boot | ✓ | |
| Wheel tick | | ✓ |
| Time pulse output | U.FL | U.FL |
| Antennas | U.FL for active GPS antenna | U.FL for active GPS antenna |

### Components

| SKU | Part |
|---|---|
| 70901-P | W230 with ZED-F9P |
| 70901-R | W230 with ZED-F9R |

### Resources

| Description | Link |
|---|---|
| Data sheet ZED-F9P | https://content.u-blox.com/sites/default/files/ZED-F9P-04B_DataSheet_UBX-21044850.pdf |
| Data sheet ZED-F9R | https://content.u-blox.com/sites/default/files/documents/ZED-F9R-03B_DataSheet_UBX-22024085.pdf |