



# BX316 GNSS Kit

## High-end Radio (RS05R) Version

### Overview

The BX316 is a GNSS RTK board for providing accurate positioning and heading information. It supports multi-constellation (GPS L1/L2, GLONASS L1/L2, and BeiDou B1/B2) signals and can output continuous and reliable RTK position and headings, even in harsh environments.

The BX316 commands and logging are compatible with NovAtel protocols. Ethernet, USB, LVTTTL, RS232, CAN, PPS, and event mark are supported. In-built 4GB memory supports data collection. The BX316 offers real-time, cost-efficient and cm-level positioning as well as flexible interfaces for a variety of applications, such as precision navigation, precision agriculture, surveying, and UAVs.



### In the Box

- 2x BX316 RTK receivers
- 3x GNSS antennas with cables
- 2x RS05R radio station modems
- 2x RS05R radio station antennas
- 2x RS05R radio station cable assemblies
- 2x TTL-RS232 converters
- 2x UART TTL-USB converters
- 2x 40-pin external cables
- 2x Power cables

### Key Features

Supports RTK positioning mode or RTK positioning + heading mode. The two modes are software configurable

Command compatible with NovAtel protocol

Supports 20Hz RTK solution updates and raw data outputs

Supports IMU raw data output

Supports in-built 4GB memory, which makes data collection easy

Supports PPS output and event mark input

Serial ports with LVTTTL or RS232

External antenna input through SMA connectors

Data output: NMEA-0183 and Tersus binary format

Correction: RTCM 2.x/3.x/CMR/CMR+

Easy to integrate with Pixhawk and other autopilots

Supports large range of input power conditions

### The RS05R High-end Radio

The Tersus radio station RS05R is a rover radio solution for wireless applications. It provides reliable data communications for mission-critical applications where a combination of stability, superior performance and long communication range are required.

The RS05R is a lightweight, ruggedized UHF receiver designed for digital radio communications between 410 MHz and 470 MHz in either 12.5 kHz or 25 kHz channels, which can be widely used in GNSS/RTK surveying and precise positioning systems. The RS05R is equipped with a LED display and a keypad, which can be used for checking the operating status, changing the operating channel, and transmitter power level.



# Technical Specifications

## Performance

|  |                       |
|--|-----------------------|
| Frequencies From Primary Antenna:      |                       |
| GPS L1/L2, GLONASS L1/L2, BeiDou B1/B2 |                       |
| Frequencies From Secondary Antenna:    |                       |
| GPS L1+GLONASS L2 or GPS L1+BeiDou B2  |                       |
| Standard Positioning Accuracy:         |                       |
| – Horizontal (RMS):                    | 1.5m                  |
| – Vertical (RMS):                      | 3.0m                  |
| RTK Positioning Accuracy:              |                       |
| – Horizontal (RMS):                    | 10mm+1ppm             |
| – Vertical (RMS):                      | 15mm+1ppm             |
| Observation Accuracy:                  |                       |
| – C/A Code (zenith direction):         | 10cm                  |
| – P Code (zenith direction):           | 10cm                  |
| – Carrier Phase (zenith direction):    | 1mm                   |
| Heading Accuracy:                      |                       |
| – 1m Baseline (RMS):                   | 0.15°                 |
| Time To First Fix (TTFF):              |                       |
| – Cold Start:                          | <50s                  |
| – Warm Start:                          | <30s                  |
| Timing Accuracy (RMS):                 | 20ns                  |
| Velocity Accuracy (RMS):               | 0.03m/s               |
| Initialization (typical):              | <10s                  |
| Initialization Reliability:            | >99.9%                |
| Correction:                            | RTCM 2.x/3.x/CMR/CMR+ |
| Max. Update Rate:                      | 20Hz                  |

## Communication

|               |                      |
|---------------|----------------------|
| Serial Ports: | LVTTL x2 or RS232 x2 |
| USB Ports:    | USB device x1        |
| CAN Ports:    | ISO/DIS 11898 x2*    |
| PPS Ports:    | LVTTL x1             |
| Event Mark:   | LVTTL x2*            |
| Ethernet:     | 10/100M BASE-T x1*   |

\* This port's function is related to FW version

## Physical

|                                 |                     |
|---------------------------------|---------------------|
| Input Voltage:                  | 5V~12V DC           |
| Power Consumption (typical):    | 3.5W                |
| Active Antenna Input Impedance: | 50Ω                 |
| Storage:                        | In-built 4GB memory |
| Size:                           | 108x54x12mm         |
| Weight:                         | 50g                 |
| Antenna Connector:              | SMA female x2       |
| COM Baud Rate:                  | Up to 921600bps     |
| Operating Temperature:          | -40°C ~ +85°C       |

