

# TERSUS<sup>!</sup>

Global Accuracy Easier



GNSS OEM Boards & Receivers



# Tersus BX-Series

## GNSS OEM Boards & Receivers

Tersus GNSS OEM boards and receivers are cost-efficient solutions for obtaining raw GNSS measurements and centimeter-level precision positioning. All BX-series OEM boards offer multi-constellation (GPS, GLONASS, BeiDou) and dual-frequency tracking capabilities, which improve the availability, continuity and reliability of RTK solutions in challenging environments.

The BX-series modules feature compatibility with major GNSS boards in the market in terms of interfaces, hardware design as well as log and command formats.

The Tersus OEM boards are easy to integrate and simple to use. The upgradeable firmware, software and comprehensive communication messages make them suitable for reconfiguration, integration and fast data processing applications.

These next-generation BX-series modules have low power consumption and offer advanced features to satisfy the needs of system integrators and various applications in a more affordable and scalable way.

### Key

### Features



Multi-GNSS



RTK, Centimeter-accurate



Fast Data Processing



On-board Data Storage



Simple to Integrate



Flexible Interfaces



Compatibility



Low Power Consumption

### Key

### Applications



Unmanned Aerial Vehicle



Automated Vehicle



Precision Agriculture



Deformation Monitoring



Construction Engineering



Robotics



Machine Control



Scientific Research



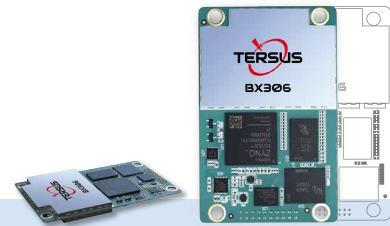
## GNSS Kits

[RS460 460MHz 2W Radio & Eagle 915MHz 1W Radio]

## **BX306** GNSS RTK Board

This compact, dual-frequency board offers robust RTK performance, which is designed to deliver centimeter precision positioning and accurate raw measurement output.

The board is capable of receiving/sending NovAtel-compatible command and logging, and is pin-to-pin compatible with NovAtel OEM615 receivers. Using the BX306 provides efficient pathways for rapid delivery of GNSS-capable products to markets.

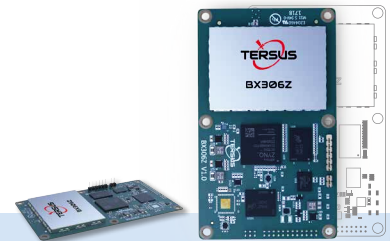


/ BX306

## **BX306Z** GNSS RTK Board

This board is a compact, multi-GNSS RTK module, which provides users with centimeter-level positioning accuracy. The BX306Z can be easily integrated with autopilots and inertial navigation units.

The module's logging and command protocol are compatible with major GNSS boards. The BX306Z has flexible interfaces and is pin-to-pin compatible with the Trimble BD970 GNSS system. It is designed for take-up by original equipment manufacturers and system integrators.



/ BX306Z

## **BX316D** GNSS RTK Board with Heading

This multi-GNSS, dual-frequency GNSS RTK board is designed for accurate positioning and heading applications. The BX316D uses common interfaces, logging and command formats, which can be configured for compatibility with major OEM boards.

The BX316D is pin-to-pin compatible with NovAtel OEM617D. It is designed for take-up by original equipment manufacturers and system integrators.



/ BX316D

## **BX409** GNSS RTK Board

The TERSUS BX409 is a cost-efficient compact GNSS RTK board for providing cm-level position accuracy and raw measurement output, which can be integrated with autopilots and inertial navigation units.

The BX409 board supports multiple constellations and frequencies to improve the continuity and reliability of the RTK solution even in harsh environments. In-built 4GB memory makes data collection easy. It features compatibility with other GNSS boards in the market via flexible interfaces, smart hardware design, and commonly used log/command formats.



/ BX409

Specifications	BX306	BX306Z	BX316D	BX409
<b>Signal Tracking</b>				
Single Antenna	GPS L1/L2 GLONASS L1/L2 BeiDou B1/B2	GPS L1/L2 GLONASS L1/L2 BeiDou B1/B2	GPS L1/L2 GLONASS L1/L2 BeiDou B1/B2	GPS L1/L2; GLONASS L1/L2; BeiDou B1/B2; Galileo E1, E5b; QZSS L1, L2 SBAS (EGNOS, WAAS, MSAS, GAGAN) L1
Dual Antenna			Primary: GPS L1/L2, GLONASS L1/L2 Secondary: GPS L1, GLONASS L1 or Primary: GPS L1/L2, BeiDou B1/B2 Secondary: GPS L1, BeiDou B1	
<b>Positioning</b>				
Standard (RMS)				
Horizontal	1.5m	1.5m	1.5m	1.5m
Vertical	3.0m	3.0m	3.0m	3.0m
RTK (RMS)				
Horizontal	10mm+1ppm	10mm+1ppm	10mm+1ppm	10mm+1ppm
Vertical	15mm+1ppm	15mm+1ppm	15mm+1ppm	15mm+1ppm
<b>Observation</b>				
C/A Code (zenith direction)	10cm	10cm	10cm	10cm
P Code (zenith direction)	10cm	10cm	10cm	10cm
Carrier Phase (zenith direction)	1mm	1mm	1mm	1mm
Heading 1m baseline (RMS)			0.15°	
<b>Performance</b>				
Time to First Fix				
Cold Start	<50s	<50s	<50s	<50s
Warm Start	<30s	<30s	<30s	<30s
Timing Accuracy (RMS)	20ns	20ns	20ns	20ns
Velocity Accuracy (RMS)	0.03m/s	0.03m/s	0.03m/s	0.03m/s
Initialization (typical)	<10s	<10s	<10s	<10s
Initialization Reliability	>99.9%	>99.9%	>99.9%	>99.9%
<b>Physical &amp; Electrical</b>				
Size	71x46x10.3mm	100x60x11.6mm	71x46x9.3mm	100x60x16mm
Weight	27g	46g	27g	44g
Input Voltage	3.3V DC	3.3V DC	3.3V DC	3.3V DC
Power Consumption (typical)	2.8W	2.9W	2.8W	2.0W
Active Antenna Input Impedance	50Ω	50Ω	50Ω	50Ω
Antenna Connector	MCX female x1	MMCX female x1	MMCX female x2	MMCX female x1
COM Baud Rate	Up to 460800bps	Up to 460800bps	Up to 460800bps	Up to 921600bps
Pin to Pin Compatible	NovAtel 615	Trimble BD970	NovAtel 617D	Trimble BD970
Operating Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data</b>				
Storage	In-built 4GB eMMC	In-built 4GB eMMC	In-built 4GB eMMC	In-built 4GB eMMC
Correction	RTCM 2.x/3.x/CMR/CMR+	RTCM 2.x/3.x/CMR/CMR+	RTCM 2.x/3.x/CMR/CMR+	RTCM 2.x/3.x/CMR/CMR+
Output	NMEA-0183 Tersus Binary Format	NMEA-0183 Tersus Binary Format	NMEA-0183 Tersus Binary Format	NMEA-0183 Tersus Binary Format
Max. Update Rate	20Hz	20Hz	20Hz	20Hz
Log & Command Compatible	NovAtel Protocol	NovAtel Protocol	NovAtel Protocol	NovAtel protocol
<b>Communication</b>				
Serial Ports	LVTTTL x2	LVTTTL x1, RS232 x1	LVTTTL x2	RS232 x3
USB Ports	USB2.0 device x1	USB2.0 device x1	USB2.0 device x1	USB2.0 device x1
CAN Ports	ISO/DIS 11898 x1 *	ISO/DIS 11898 x1 *	ISO/DIS 11898 x1 *	ISO/DIS 11898 x1 *
PPS Ports	LVTTTL x1	LVTTTL x1	LVTTTL x1	LVTTTL x1
Event Mark	LVTTTL x1	LVTTTL x1	LVTTTL x1	LVTTTL x1
<b>Antenna Match</b>				
Antenna Output Voltage	3.3V	3.3V	3.3V	3.3V
<b>GNSS Options</b>				
Evaluation Board	√	√	√	√
Enclosure	√		√	

Remarks:

\* This port's function is related to firmware version.

# GNSS Kits

## Get Started with a Comprehensive GNSS Kit

We provide affordable, high-quality GNSS kits for high precision applications. These kits feature centimeter-accurate GNSS OEM RTK boards, GNSS antennas, radios, cables and other accessories, which support straight-forward integration of GNSS RTK technology into applications and products.

### BX316D GNSS Kit

- 2 x BX316D GNSS RTK receivers
- 3 x AX3702 GNSS antennas with 3m antenna cables
- 2 x RS460 2W/460MHz radio with antennas
- 2 x USB Type A to USB Mini cable
- 2 x UART to USB converters
- 2 x 20pin external cables
- 1 x USB to 2pin BX316D power + 2W-Radio-power and COM cable
- 1 x Bullet-DC to 2pin BX316D power + 2W-Radio-power and COM cable
- 1 x Bullet-DC to Alligator Clip
- 2 x 2pin power cables



### BX316D GNSS UAV Kit

- 2 x BX316D GNSS RTK receivers
- 1 x AX3702 GNSS antennas with 3m antenna cables
- 2 x Eagle 1W/915MHz radio with antennas
- 2 x power & data cable for Eagle radio
- 2 x USB Type A to USB Mini cable
- 2 x AX3703 GNSS Aviation Antennas with SMA cables
- 2 x 20pin external cables
- 2 x UART to USB converters
- 2 x 2pin power cables



We offer different versions of GNSS kits for your various applications. Visit our website [www.teresus-gnss.com](http://www.teresus-gnss.com) for details.

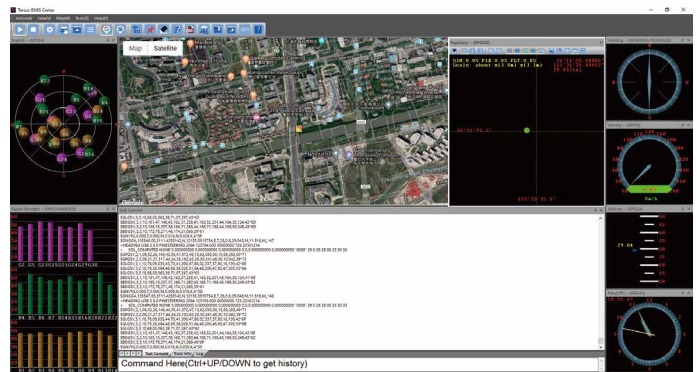
# Tersus GNSS Center

**Tersus GNSS Center** is a configuration tool for Tersus GNSS OEM boards. This software integrates configuration, monitoring, data logging, firmware upgrade and other useful tools. With Tersus GNSS Center, you can

- Communicate over the on-board serial ports
- Key in commands to configure the board
- Upgrade firmware
- Store data, playback data
- Convert the data to RINEX format
- Display the rover's trajectory in Google/Baidu
- Calculate the average position of the base station
- View status of the board and positioning results

### Other software for Tersus GNSS OEM boards

- Tersus RINEX converter
- Tersus GeoPix



## Tersus GNSS Inc.

Global Accuracy Easier

Tersus is a leading GNSS RTK solution provider. Our engineers have been pioneers in the design of GNSS products to support high-precision positioning applications.

Our products include GNSS RTK & PPK OEM boards and receivers, as well as integrated solutions such as the David GNSS Receiver, Oscar Receiver, MatrixRTK, and GNSS-aided Inertial Navigation System.

Designed for easy and rapid integration, our GNSS solutions offer centimeter-level positioning accuracy and flexible interfaces for a variety of applications including: unmanned aerial vehicle (UAVs), surveying, mapping, construction engineering, and precision agriculture.

To learn more, visit [www.tersus-gnss.com](http://www.tersus-gnss.com)  
Sales inquiry : [sales@tersus-gnss.com](mailto:sales@tersus-gnss.com)  
Technical support : [support@tersus-gnss.com](mailto:support@tersus-gnss.com)



Descriptions, specifications and related materials are subject to change.  
©2019 Tersus GNSS Inc. All rights reserved.