Tersus UAV PPK Solution with Base

Cost-effective UAV PPK solution

Overview

Tersus UAV PPK solution with Base includes BX306 PPK Receiver, AX3705 Helix Antenna (or AX3703 GNSS Aviation Antenna as another option), David Base Kit Network Mode and Tersus GeoPix Software. BX306 PPK Receiver supports multi-constellations and dual-frequencies. It has in-built 4GB memory (eMMC) for GNSS observation data recoding. Very small and light AX3705 Helix Antenna and AX3703 GNSS Aviation Antenna are designed for UAV applications. David Base Kit Network Mode can work as a base station to record GNSS raw data for post processing, and also as an easy-to-use rover receiver to measure Ground Control Points for photogrammetry.

Tersus GeoPix integrates the functions of GNSS observation post processing, Event Mark interpolation and geotagging in EXIF. By clicking one button after input all necessary data, the software provides the result directly as input for image processing software. Tersus GeoPix is part of Tersus Tool Suite which can be downloaded from Tersus official website.

Key Features

- Supports GPS L1/L2, GLONASS L1/L2, BeiDou B1/B2
- Supports 384 channels
- Up to 20Hz raw data output
- Supports in-built 4GB memory, which makes data collection easy
- Log/command compatible with NovAtel protocol
- Supports PPS output and event mark input
- Serial ports with LVTTL
- External antenna inputs 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

UAV PPK Rover

David Base Kit
Network Mode

Note: If users want to customize the product portfolio, please contact sales@tersus-gnss.com by email.

Technical Specifications - BX306 PPK Enclosure

Performance

Signal Tracking:	GPS L1/L2, GLONASS L1/L2, BeiDou B1/B2
GNSS Channels:	384
Single Point Positioning Accuracy (RMS):	
– Horizontal:	1.5m
– Vertical:	3.0m
PPK Positioning Accuracy (RMS):	
– Horizontal:	10mm+1ppm
– Vertical:	15mm+1ppm
Observation Accuracy (zenith direction):	
– C/A Code:	10cm
– P Code:	10cm
– Carrier Phase:	1mm
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
Input Voltage:	5~28V DC
Power Consumption (typical):	2.8W
Active Antenna Input Impedance:	50Ω
Storage:	In-built 4GB memory

Communication

Serial Ports:	LVTTL x2
USB Ports:	USB 2.0 device x1
CAN Ports:	ISO/DIS 11898 x1*
PPS Ports:	LVTTL x1
Event Mark:	LVTTL x1
Antenna Connector:	SMA female x1
COM Baud Rate:	Up to 460800bps

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

Physical

Size:	95x57x24mm
Weight:	153g
Operating Temperature:	-40℃ ~ +85℃

Website | www.tersus-gnss.com
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Technical Support | support@tersus-gnss.com

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Technical Specifications - AX3705 Helix Antenna

Performance

Frequencies:	GPS L1/L2 GLONASS L1/L2 BeiDou B1/B2
Peak Gain: 1217-1257MHz 1559-1610MHz	 2dBi 2.5dBi
Polarization:	RHCP
Axial Ratio:	≤3dB
Impedance:	50Ω
Phase Center Offset:	37.2mm
Phase Center Accuracy:	±3mm

LNA

LNA Gain:	33dB(typical)
Noise Figure:	≤1.5dB
Output/Input VSWR:	≤2.0
Operation Voltage:	3.3V~12V DC
Operation Current:	55mA (max)
Group Delay Ripple:	< 15ns

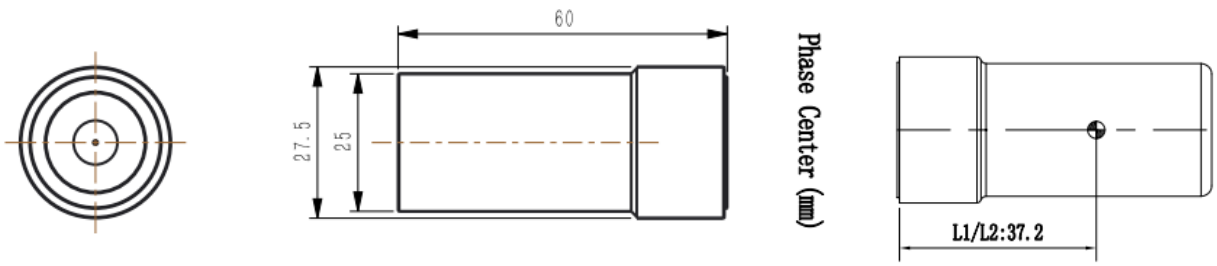
Mechanical

Size:	ϕ 27.5x60mm
Connector:	SMA Male
Weight:	≤19g

Environmental

Operating Temperature:	-40℃ ~ +70℃
Storage Temperature:	-40℃ ~ +70℃
Humidity:	95% not condensing
Dust- & Waterproof:	IP65

Structure Overview



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Technical Specifications
- AX3703 GNSS Aviation Antenna

Performance

Frequencies: GPS L1/L2, GLONASS L1/L2, BeiDou B1/B2/B3	
Peak Gain:	4dBi
Polarization:	RHCP
Axial Ratio:	≤3dB
Azimuth Coverage:	360°
Impedance:	50Ω
Output VSWR:	≤2.0
Phase Center Offset:	20.24mm
Phase Center Accuracy:	±3mm

LNA

LNA Gain:	36±2dB
Noise Figure:	≤2.0dB
Output VSWR:	≤2.0
Operation Voltage:	3V~12V DC
Operation Current:	≤45mA
Group Delay:	≤5ns

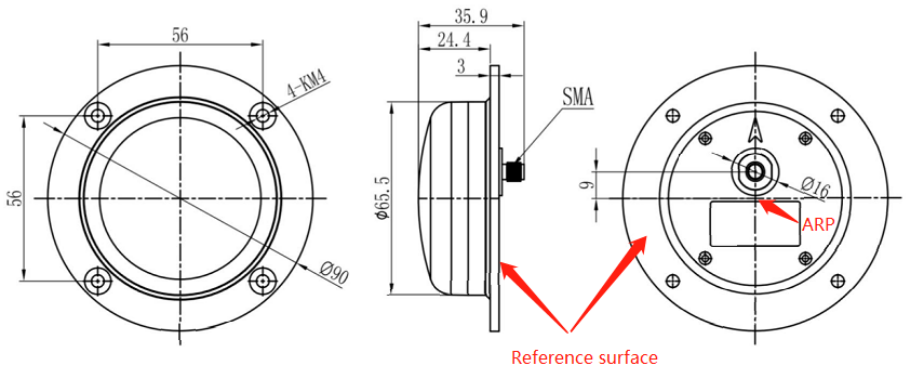
Mechanical

Dimension:	ϕ 90x41.5mm
Connector:	SMA Female
Weight:	137g

Environmental

Operating Temperature:	-40℃ ~ +80℃
Storage Temperature:	-55℃ ~ +85℃
Humidity:	95% not condensing
Dust- & Waterproof:	IP67

Structure Overview



Top view | Side view | Bottom view

Dimension (mm)

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Technical Specifications - David GNSS Receiver

Performance

Signal Tracking For Antenna:	GPS L1, L2; GLONASS L1, L2; BeiDou B1, B2
GNSS Channels:	384
Single Point Positioning Accuracy (RMS):	
– Horizontal:	1.5m
– Vertical:	3.0m
Real Time Kinematic (RMS):	
– Horizontal:	10mm+1ppm
– Vertical:	15mm+1ppm
Post Processed Kinematic (RMS):	
– Horizontal:	10mm+1ppm
– Vertical:	15mm+1ppm
Static Post Processing (RMS):	
– Horizontal:	3mm+0.5ppm
– Vertical:	5mm+0.5ppm
Observation Accuracy (zenith direction):	
– C/A Code:	10cm
– P Code:	10cm
– Carrier Phase:	1mm
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%
Max. Measurements Update Rate:	20Hz
Input Voltage:	5V~12V DC[1]
Power Consumption (at 25℃):	3.2W (David only)
Active Antenna Input Impedance:	50Ω
Storage:	In-built 4GB memory

Communication

Serial Ports:	RS232 x2
USB Ports:	USB 2.0 device x1
Antenna Connector:	SMA female x1
COM Baud Rate:	Up to 460800bps

Software Support

Tersus Nuwa

MicroSurvey FieldGenius

Other Third Party Software Support NMEA-0183

Physical

Dimension:	104x65x31mm (David only)
Weight:	≈ 250g (David only)
Operating Temperature:	-40℃ ~ +85℃
Dust- & Waterproof:	IP67

Optional Accessories

2W 460MHz/30W 460MHz radio to transmit/receive RTK corrections

Battery bank

Note: 1. It is recommended using 2A instead of 1A when the external power is 5V.

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Technical Specifications - AX3702 Survey Antenna

Performance

Frequencies: GPS L1/L2, GLONASS L1/L2, BeiDou B1/B2/B3	
Impedance:	50Ω
Polarization:	RHCP
Axial Ratio:	≤3dB
Azimuth Coverage:	360°
Output VSWR:	≤2.0
Peak Gain:	5.5dBi
Phase Center Offset:	54.04mm
Phase Center Accuracy:	±2mm

LNA

LNA Gain:	40±2dB
Noise Figure:	≤2.0dB
Output VSWR:	≤2.0
Operation Voltage:	3.3V~12V DC
Operation Current:	≤45mA
Ripple:	±2dB

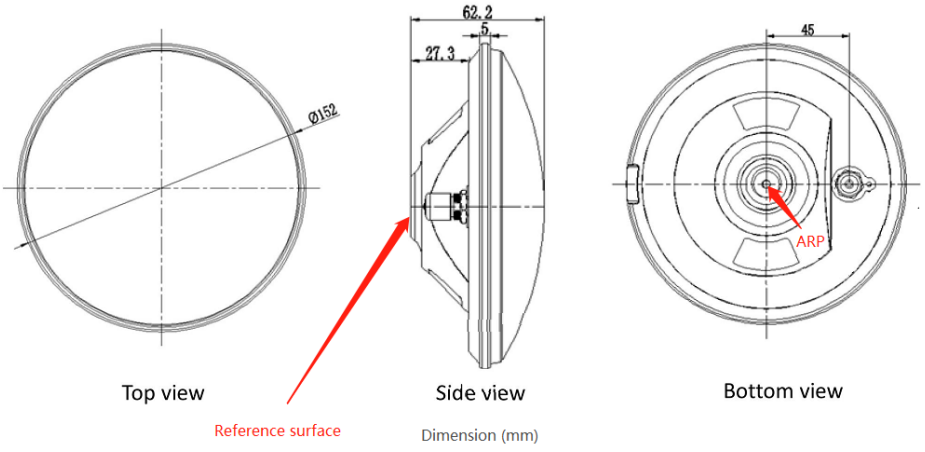
Environmental

Operating Temperature:	-45℃ ~ +85℃
Storage Temperature:	-45℃ ~ +85℃
Humidity:	95% not condensing

Mechanical

Dimension:	ϕ 152x62.2mm
Connector:	TNC Female
Screw Hole for assembly:	5/8"×11 UNC Female
Weight:	374g

Structure Overview



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Technical Specifications - Tersus GeoPix

System Requirements

Operating System:
Microsoft Windows XP, 7, 8, 10 (32-bit and 64-bit)

Processor
- Minimum: Intel Core 2.0 Duo
- Recommended: Intel Core i5

RAM
- Minimum: 4GB
- Recommended: 8GB

Hard Disk
- Minimum: 500GB
- Recommended: 1TB

Graphics Card
- Minimum: Direct X9 compatible integrated graphics
- Recommended: Direct X9 compatible 2GB discrete graphics

Language Supported

English

Features

Simple software interface and simple workflow

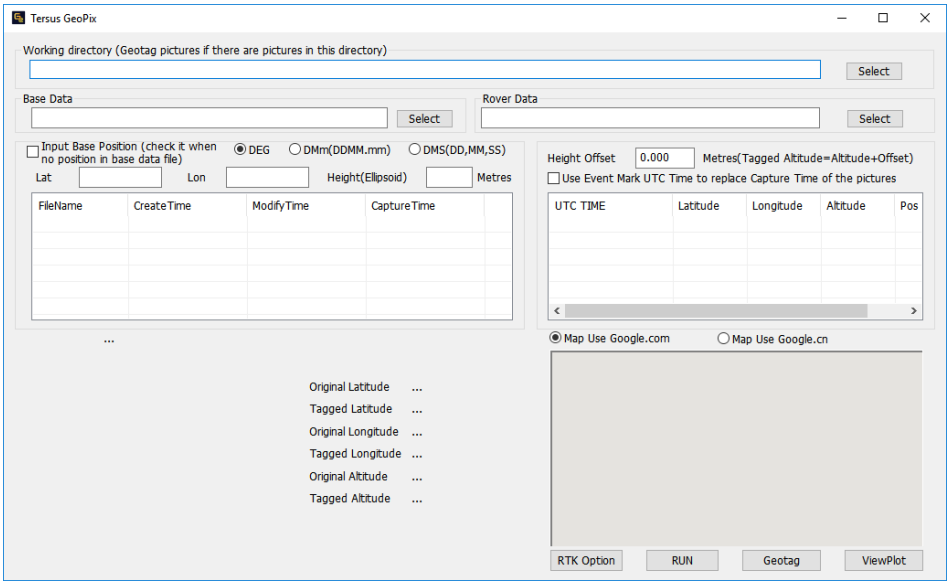
Automatic processing GNSS data and geotagging images by one button click

Shows the result in trajectory plot and the images on online map

Provides PPK result in both EXIF and text file

The result can be directly used by image processing software, i.e., Pix4D, Agrisoft, etc.

Supports Base Station data from CORS or other brands GNSS Receiver, i.e., RTCM3 and RINEX format



Tersus GeoPix main interface

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