TOKNAV

Guangzhou Toksurvey Information Technology Co.,Ltd
www.toknav.cn | info@toknav.cn

Europe, North and South America
Tel and WhatsApp:
+1 (323) 847-7713 (lan)

Asia, Africa and Oceania
Tel and WhatsApp:
+86 139 2607 5986 (Jeffrey)

No. 9 Caipin Road，Building B, Room 902-3, Huangpu District,
Guangzhou, China 510000

TOKNAV
www.toknav.cn

GNSS Receiver
PRODUCT BROCHURE

- GNSS Receiver Manufacturer
- Professional OEM&ODM
- Over 15 years experience in R&D and manufacturing

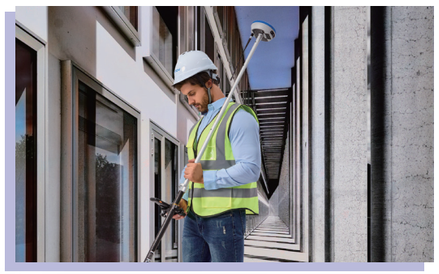
ABOUT US

Company Introduction

Guangzhou Toksurvey Information Technology Co., Ltd. was founded in 2019 by a team of R&D engineers. The company team has nearly 15 years of R&D background. At present, the company has nearly 2,500 square meters of office and factory, complete set of research equipment, and strong technical background.

Our company is committed to the R&D, production and sales of high-precision satellite positioning terminal products. More than 60% of the employees are engineers. Driven by technological innovation, the company maintains a steady growth rate of 60% every year.

At present, the company has successfully launched high-precision GNSS RTK (T5 series, T10 series, T20 series, T30 series and T40 series), portable RTK receiver (P8 series), high-precision CORS station (NET660 series), data controller, GNSS antenna, precision agriculture, mechanical control, and marking robot to the market. We not only provide positioning products, but also provide a series of application solutions.



TOKNAV

Our Targets

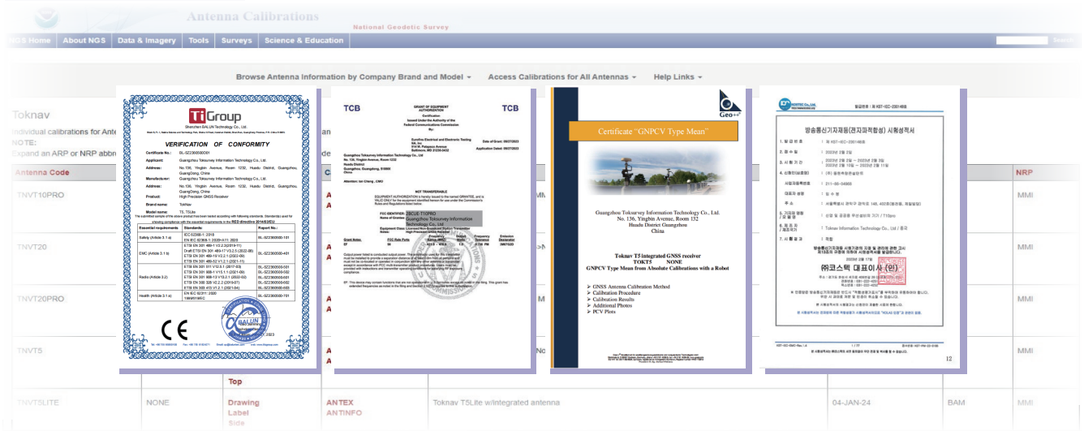
Mission	Vision	Value	Slogan
Make positioning more precise and easier.	Working together to improve global surveying quality.	To become a leader in the global surveying and mapping service.	Your reliable supplier in positioning!

Fields of Application

TOKNAV products can be widely used in precision surveying & mapping, mining operations, deformation monitoring, autonomous driving and other fields. We currently have a number of mature GNSS application solutions, such as deformation monitoring, CORS network, marking robots, precision agriculture, mechanical control etc. TOKNAV products have passed CE, FCC, KC, NGS, IGS and other certifications, and are exported to more than 70 countries and regions around the world. Our products are well received in the global market, and now we have become a system integration supplier in the global market.

- Construction
- Monitoring
- Mapping & GIS
- Surveying
- Agriculture
- Marine

Certifications



CONTENT

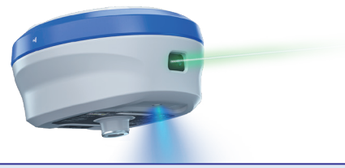
Products

GNSS Receiver Line Overview

PRODUCTS		T5Lite	T5	T10Pro	T20Pro	tBase
ITEM						
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz				
OS		Linux				
GNSS	GPS	L1C/A, L1C, L2P(Y), L2C, L5				
	GLONASS	L1, L2, L3				
	GALILEO	E1, E5a, E5b, E6				
	BDS	B1I, B2I, B3I, B1C, B2a, B2b				
	QZSS	L1, L2, L5				
	SBAS	L1				
	NavIC (IRNSS)	L5				
	Channel	1408				
	Data format	NMEA-0183				
	Correction I / O Protocol	RTCM3.X				
	Data update frequency	5Hz(max)		20Hz(max)		
SYSTEM	Bluetooth	BR+EDR+BLE				
	WIFI	802.11 b/g/n				
	Network	LTE FDD: B1/2/3/5/8 LTE TDD: B38/39/40/41 GSM: 900/1800MHz		LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8		
	Data Radio	Not support	Receive Only Frequency: 410~470MHz Protocol: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT Air baud rate: 9600 / 19200bps	Frequency: 410~470MHz Protocol: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT RF transmit power: 0.5W/1.5W Air baud rate: 9600 / 19200bps	Integrated high-power transceiver Protocols: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT Frequency Range: 410~470MHz Power: 1W/2W/5W Air Baud Rate: 9600, 19200bps	
	Storage	32GB				
	Tilt measurement	IMU60°				
	Other	Not support		NFC		
ELECTRICAL	Battery	3.7V, 9600mAh			7.4V, 6500mAh	7.2V, 13800mAh
	Work time	More than 16 hours (Rover)			More than 18 hours (Rover)	More than 12 hours (5W Radio, Base)
	Charge	MTK PE+1.1/2.0 9V/2A, USB PD 12V/1.25A, 5V/3A			USB PD 15V/2A, 5V/3A	
ENVIRONMENTAL	Work Temperature	-20℃~+60℃				
	Storage Temperature	-40℃~+85℃				
	Shock	Withstand 1.5M pole drop				
	Protection	IP65		IP68		
PHYSICAL	Material	Magnesium alloy main body, ABS/PC top cover				
	Dimension	100.5mm*100.5mm*69mm	100.5mm*100.5mm*72mm	Φ147.9mm*68mm	Φ143.5mm*90.7mm	Φ174.9mm*104.9mm
	Weight	600g	630g	740g	900g	1500g

Manufacturers may update parameters at any time, please refer to the latest product information.

GNSS Receiver Line Overview

PRODUCTS		T30	T30Pro	T40	T40Pro
ITEM					
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz			
OS		Linux			
GNSS	GPS	L1C/A, L1C, L2P(Y), L2C, L5			
	GLONASS	L1, L2, L3			
	GALILEO	E1, E5a, E5b, E6			
	BDS	B1I, B2I, B3I, B1C, B2a, B2b			
	QZSS	L1, L2, L5			
	SBAS	L1			
	NavIC (IRNSS)	L5			
	Channel	1408			
	Data format	NMEA-0183			
	Correction I / O Protocol	RTCM3.X			
	Data update frequency	20Hz(max)			
SYSTEM	Bluetooth	BR+EDR+BLE			
	WIFI	802.11 b/g/n			
	Network	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8			
	Data Radio	Integrated high-power transceiver Protocols: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT Frequency Range: 410~470MHz Power: 1W/2W/5W Air Baud Rate: 9600, 19200bps			
	Storage	32GB			
	Tilt measurement	IMU60°			
	Other	NFC, AR Stakeout, Laser Measurement	NFC, AR Stakeout, Photogrammetry	NFC, AR Stakeout, Laser Measurement, Laser Assist Camera	NFC, AR Stakeout, Photogrammetry
ELECTRICAL	Battery	7.2V, 13800mAh		7.2V , 3400mAh *2	
	Work time	More than 48 hours (Rover)		More than 20 hours (Rover)	
	Charge	USB PD 15V/2A, 5V/3A		Dedicated charger, 9~24VDC	
ENVIRONMENTAL	Work Temperature	-20°C~+60°C			
	Storage Temperature	-40°C~+85°C		-20°C~+70°C	
	Shock	Withstand 1.5M pole drop			
	Protection	IP68			
PHYSICAL	Material	Magnesium alloy main body, ABS/PC top cover			
	Dimension	Φ174.9mm*104.9mm		Φ160mm*103mm	
	Weight	1500g		850g(without battery)	

Manufacturers may update parameters at any time, please refer to the latest product information.

GNSS Receiver Line Overview

PRODUCTS		NET660	NET660i	NET660i-H	NET660i-1U
ITEM					
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz			
OS		Linux			
GNSS	GPS	L1C/A, L2P(Y), L2C, L5	L1C/A, L1C, L2P(Y), L2C, L5	L1C/A, L2P, L2C, L5	L1C/A, L1C, L2, L5
	GLONASS	L1, L2, L3		L1, L2	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b		B1I, B2I, B3I, B1C, B2b	B1I, B2I, B3I, B1C, B2a, B2b
	GALILEO	E1, E5a, E5b	E1, E5a, E5b, E6	E1, E5a, E5b, E6	
	QZSS	L1 C/A, L2C, L5	L1, L2, L5		L1, L2, L5, L6(CLAS)
	SBAS	L1 C/A	L1	L1 C/A	
	NavIC (IRNSS)	L5		Not support	L5
	Channel	/	1408		1507
	Differential Data	RTCM 3.X			
	Position Data	NMEA-0183			
	Frequency	1Hz, 2Hz, 5Hz, 10Hz, 20Hz			2Hz, 5Hz (Turn off Integrated Navigation)
	Data format	RINEX, Custom			
	IMU	Not support			Support
SYSTEM	Serial Port	Standard RS232 interface with baud rates supporting 9600, 19200, 38400, 115200, and 230400 bps			
	Network port	Standard RJ45 interface, 10/100M adaptive			
	USB	Applying Type-C Interface, Quick Charge and data transfer supported	Integrated on the 7-pin interface, support access to the computer to copy data directly		
	Network Communication	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8			
	Interface	PWR*1: Power supply port DATA*1 COM*2 SIM*1 PPS*1 Ethernet*1 GNSS*1: Main antenna 4G*1: 4G antenna port	PWE*1: Power supply port DATA*1 PPS*1 SIM*1: Nano SIM card Ethernet*1 GNSS*1: Main antenna 4G*1: 4G antenna port	PWE*1: Power supply port DATA*1 PPS*1 SIM*1: Nano SIM card Ethernet*1 GNSS*2: TCN port 4G*1: 4G antenna port	PWE*1: Power supply port DATA*1 PPS*1 SIM*1: Nano SIM card Ethernet*1 GNSS*1: Main antenna 4G*1: 4G antenna port
	Storage	32GB storage			
ENVIRONMENTAL	Operating Temperature	-20℃~+60℃	-40℃~+85℃		
	Storage Temperature	-20℃~+70℃	-40℃~+85℃		
	Protection Class	IP68			
PHYSICAL	Material	Magnesium alloy main body			
	Dimension	172*148*58mm	148.8*105*50.3mm		
	Weight	1920g	490g		

Manufacturers may update parameters at any time, please refer to the latest product information.

T5Lite GNSS Receiver

T5Lite is a mini portable multifunctional GNSS receiver, a new generation of measurement engine supporting tilt measurement, built-in 4G Modem, Bluetooth and WIFI. It adopts a new appearance design, magnesium alloy structure and Linux operating system. It is an economical, portable geodesic GNSS receiver.

HEIGHT	LENGTH	WEIGHT
69mm	100.5mm	600g

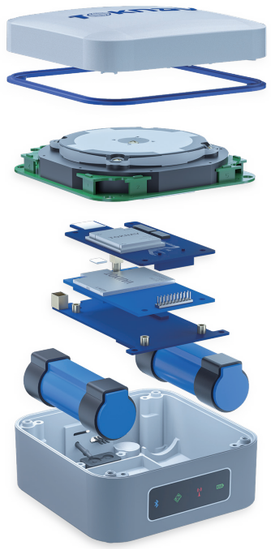
CHARACTERISTIC

Linux Intelligent System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.

Multi Constellation

With its 1408 channels, T5Lite provides an excellent on board real time navigation solution with high accuracy. All GNSS signals (GPS, GLONASS, BDS, GALILEO, QZSS, SBAS and IRNSS) are included.



Tilt Measurement

T5Lite has the IMU module. Fast initialization and up to 60° inclination.

Combined Antenna

The new four in one antenna integrates GNSS, WIFI, Bluetooth and 4G, with smaller volume and better signal.

4G Modem

T5Lite has an internal 4G Modem that operates with more cellular network signals. A fast internet connection is guaranteed.

Long Endurance

Built-in high-capacity lithium battery ensures continuous working time of more than 16 hours under normal operation.

IP65 Design

Industrial design, solid magnesium ally shell, in line with IP65 design requirements, safe and reliable.

TECHNICAL PARAMETERS

TOKNAV

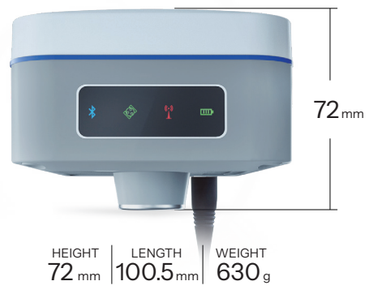
ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz	
OS		Linux	
GNSS	GPS	L1C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Data format	NMEA-0183	
	Correction I / O Protocol	RTCM3.X	
	Data update frequency	5Hz (max)	
	Recapture Time	<1s	
	Cold Boot	<40s	
POSITIONING ACCURACY	Single (RMS)	Horizontal: 1.5m ; Vertical: 2.5m	
	DGPS (RMS)	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK (RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Time Accuracy (RMS)	20ns	
	Static Accuracy (RMS)	Horizontal: ±(2.5mm+0.5ppm) Vertical : ±(5mm+0.5ppm)	
	Speed Accuracy (RMS)	0.03m/s	
	Tilt compensation Accuracy(within 60°)	<2cm	
SYSTEM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	LTE FDD: B1/2/3/5/8 LTE TDD: B38/39/40/41 GSM: 900/1800MHz	
	Storage	32GB storage	
INDICATOR	Bluetooth Indicator	Show Bluetooth status	
	Satellite Indicator	Show position status	
	Data link Indicator	Show differential signal status	
	Power Indicator	Show power status	
BATTERY	Battery	3.7V, 9600mAh	
	Work time	More than 16 hours (Typical, Rover, GSM)	The static working mode supports continuous data collection for 24 hours under full power.
	Charge	MTK PE+1.1/2.0 9V/2A USB PD 12V/1.25A 5V/3A	Support fast charging adapter and adaptively and dynamically adjust charging current.
ENVIRONMENTAL	Work Temperature	-20℃~+60℃	
	Storage Temperature	-40℃~+85℃	
	Shock	Withstand 1.5M pole drop	
	Protection	IP65	
PHYSICAL	Material	Magnesium alloy main body, ABS/PC top cover	
	Dimension	100.5mm*100.5mm*69mm	
	Weight	600g	
CERTIFICATION	Regulatory Compliance	CE, NGS	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

T5 GNSS Receiver

T5 is a mini portable multifunctional GNSS receiver, a new generation of measurement engine, supporting tilt measurement, built-in 4G Modem, radio, Bluetooth and WIFI. It adopts a new appearance design, magnesium alloy structure and Linux operating system. It is an extremely light-weight and portable geodesic GNSS receiver.



CHARACTERISTIC

Linux Intelligent System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.

Multi Constellation

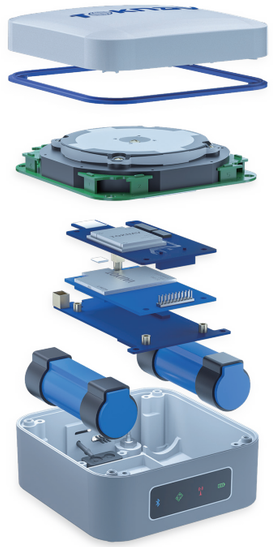
With its 1408 channels, T5 provides an excellent on board real time navigation solution with high accuracy. All GNSS signals (GPS, GLONASS, BDS, GALILEO, QZSS, SBAS and IRNSS) are included.

Tilt Measurement

T5 has the IMU module. Fast initialization and up to 60° inclination.

Combined Antenna

The new four in one antenna integrates GNSS, WIFI, Bluetooth and 4G, with smaller volume and better signal.



4G Modem

T5 has an internal 4G Modem that operates with more cellular network signals, A fast internet connection is guaranteed.

Long Endurance

Built-in high-capacity lithium battery ensures continuous working time of more than 16 hours under normal operation.

IP65 Design

Industrial design, solid magnesium alloy shell, in line with IP65 design requirements, safe and reliable.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz	
OS		Linux	
GNSS	GPS	L1C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Data format	NMEA-0183	
	Correction I / O Protocol	RTCM3.X	
	Data update frequency	5Hz (max)	
	Recapture Time	<1s	
	Cold Boot	<40s	
POSITIONING ACCURACY	Single (RMS)	Horizontal: 1.5m ; Vertical: 2.5m	
	DGPS (RMS)	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK (RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Time Accuracy (RMS)	20ns	
	Static Accuracy (RMS)	Horizontal: ±(2.5mm+0.5ppm) Vertical: ±(5mm+0.5ppm)	
	Speed Accuracy (RMS)	0.03m/s	
	Tilt compensation Accuracy (within 60°)	≤2cm	
SYSTEM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	LTE FDD: B1/2/3/5/8 LTE TDD: B38/39/40/41 GSM: 900/1800MHz	
	Data Radio	Receive Only Frequency: 410~470MHz Protocol: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT Air baud rate: 9600 / 19200bps	
	Storage	32GB storage	
INDICATOR	Bluetooth Indicator	Show Bluetooth status	
	Satellite Indicator	Show position status	
	Data link Indicator	Show differential signal status	
	Power Indicator	Show power status	
BATTERY	Battery	3.7V, 9600mAh	
	Work time	More than 16 hours (Typical, Rover, GSM)	The static working mode supports continuous data collection for 24 hours under full power.
	Charge	MTK PE+1.1/2.0 9V/2A USB PD 12V/1.25A 5V/3A	Support fast charging adapter and adaptively and dynamically adjust charging current.
ENVIRONMENTAL	Work Temperature	-20℃~+60℃	
	Storage Temperature	-40℃~+85℃	
	Shock	Withstand 1.5M pole drop	
	Protection	IP65	
PHYSICAL	Material	Magnesium alloy main body,ABS/PC top cover	
	Dimension	100.5mm*100.5mm*72mm	
	Weight	630g	
CERTIFICATION	Regulatory Compliance	NGS, CE	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

T10Pro GNSS Receiver

T10Pro is a latest portable multifunctional GNSS receiver, a new generation of measurement engine, supporting tilt measurement, NFC, built-in 4G Modem, Bluetooth and WIFI. It adopts a new appearance design, magnesium alloy structure and Linux operating system. It is an extremely light-weight, fully functional and portable geodesic GNSS receiver.

HEIGHT	DIAMETER	WEIGHT
68mm	147.9mm	740g

CHARACTERISTIC

Linux Intelligent System

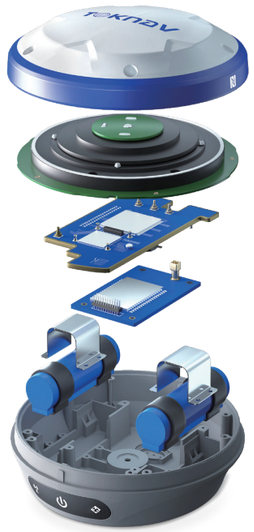
ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.

Multi Constellation

With its 1408 channels, T10Pro provides an excellent on board real time navigation solution with high accuracy. All GNSS signals (GPS, GLONASS, BDS, GALILEO, QZSS, SBAS and IRNSS) are included.

Tilt Measurement

T10Pro has the IMU module. Fast initialization and up to 60° inclination.



Combined Antenna

The new four in one antenna integrates GNSS, WIFI, Bluetooth and 4G, with smaller volume and better signal.

4G Modem

T10Pro has an internal 4G Modem that operates with more cellular network signals. A fast internet connection is guaranteed.

Long Endurance

Built-in high-capacity lithium battery ensures continuous working time of more than 16 hours under normal operation.

IP68 Design

Industrial design, solid magnesium alloy shell, in line with IP68 design requirements, safe and reliable.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz	
OS		Linux	
GNSS	GPS	L1C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Data format	NMEA-0183	
	Correction I / O Protocol	RTCM3.X	
	Data update frequency	20Hz(max)	
	Recapture Time	<1s	
	Cold Boot	<30s	
POSITIONING ACCURACY	Single (RMS)	Horizontal: 1.5m ; Vertical: 2.5m	
	DGPS(RMS)	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK(RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Time Accuracy (RMS)	20ns	
	Static Accuracy (RMS)	Horizontal: ±(2.5mm+0.5ppm) Vertical: ±(5mm+0.5ppm)	
	Speed Accuracy (RMS)	0.03m/s	
	Tilt compensation Accuracy(within 60°)	≤2cm	
SYSTEM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	LTE FDD:B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Data Radio	Frequency: 410~470MHz Protocol: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT RF transmit power: 0.5W/1.5W Air baud rate: 9600 / 19200bps	
	Storage	32GB storage	
INDICATOR	Power Indicator	Show power status	
	Satellite Indicator	Show position status	
	Data link Indicator	Show differential signal status	
BATTERY	Battery	3.7V, 9600mAh	
	Work time	More than 16 hours (Typical, Rover, GSM)	The static working mode supports continuous data collection for 24 hours under full power.
	Charge	MTK PE+1.1/2.0 9V/2A USB PD 12V/1.25A 5V/3A	Support fast charging adapter and adaptively and dynamically adjust charging current.
ENVIRONMENTAL	Work Temperature	-20℃~+60℃	
	Storage Temperature	-40℃~+85℃	
	Shock	Withstand 1.5M pole drop	
	Protection	IP68	
PHYSICAL	Material	Magnesium alloy main body, ABS/PC top cover	
	Dimension	Φ147.9mm*68mm	
	Weight	740g	
CERTIFICATION	Regulatory Compliance	NGS, CE, KC, FCC	

Equipped with electronic fence system, Toknav's product have area code restrictions. Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

T20Pro GNSS Receiver

T20Pro is a high-performance GNSS receiver that provides an easy-to-use solution for users. TOKNAV T20Pro supports the original tilt compensating GNSS solution. Multi constellation and frequency tracking always guarantee a fixed solution for your job. LCD display screen can make your operation faster and easier. T20Pro built-in 5W radio allows users to have a longer working distance, up to 16km in open areas, The durable IP68 design makes it possible to work in extreme environments.

HEIGHT	DIAMETER	WEIGHT
90.7mm	143.5mm	900g

CHARACTERISTIC

Linux Intelligent System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.

Multi Constellation

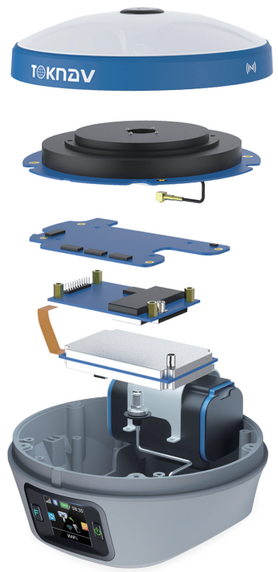
With its 1408 channels, T20Pro provides an excellent on board real time navigation solution with high accuracy. All GNSS signals (GPS, GLONASS, BDS, GALILEO, QZSS and SBAS) are included.

Adjustable Power

T20Pro has an internal radio of adjustable power of 1W/2W/ 5W, and works as base station at 5W power. The transmission distance can reach to maximum 16km when working in the open areas.

Combined Antenna

The new four in one antenna integrates GNSS, WIFI, Bluetooth and 4G, with smaller volume and better signal.



4G Modem

T20Pro has an internal 4G Modem that operates with more cellular network signals. A fast internet connection is guaranteed.

Long Endurance

Built-in high-capacity lithium battery ensures continuous working time of more than 18 hours under normal operation.

IP68 Design

Industrial design, solid magnesium alloy shell, in line with IP68 design requirements, safe and reliable.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz	
OS		Linux	
GNSS	GPS	L1C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Data format	NMEA-0183	
	Correction I / O Protocol	RTCM3.X	
	Data update frequency	20Hz(max)	
	Recapture Time	<1s	
	Cold Boot	<40s	
POSITIONING ACCURACY	Single (RMS)	Horizontal: 1.5m；Vertical: 2.5m	
	DGPS(RMS)	Horizontal: 0.4m；Vertical : 0.8m	
	RTK(RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Time Accuracy (RMS)	20ns	
	Static Accuracy (RMS)	Horizontal: ±(2.5mm+0.5ppm) Vertical: ±(5mm+0.5ppm)	
	Speed Accuracy (RMS)	0.03m/s	
	Tilt compensation Accuracy(within 60°)	⩽2cm	
SYSTEM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Data Radio	Frequency: 410~470MHz Protocol: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT RF transmit power:1W/2W/5W Air baud rate: 9600 / 19200bps	
	Storage	32GB storage	
DISPLAY	LCD	Screen size: 1.3inch Display mode: TFT Display format: 240*RGB*240 View Angle: FULL	
BATTERY	Battery	7.4V, 6500mAh	
	Work time	More than 18 hours (Typical, Rover, GSM)	The static working mode supports continuous data collection for 26 hours under full power.
	Charge	USB PD 15V/2A 5V/3A	Support fast charging adapter and adaptively and dynamically adjust charging current.
ENVIRONMENTAL	Work Temperature	-20℃~+60℃	
	Storage Temperature	-40℃~+85℃	
	Shock	Withstand 1.5M pole drop	
	Protection	IP68	
PHYSICAL	Material	Magnesium alloy main body, ABS/PC top cover	
	Dimension	Φ143.5mm*90.7mm	
	Weight	900g	
CERTIFICATION	Regulatory Compliance	NGS, CE, FCC	

Equipped with electronic fence system, Toknav's product have area code restrictions. Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

tBase GNSS Receiver

The tBase is designed and developed specifically for professional base station applications. It features a high-precision positioning module, supporting full-system, multi-frequency satellite signal tracking. Equipped with 4G, Bluetooth, WiFi, a 5W radio, and a large-capacity battery, it meets the demands for concurrent data links at base stations and alleviates the endurance concerns typical of built-in radio work modes, making measurements more convenient and efficient.

HEIGHT 104.9mm | DIAMETER 174.9mm | WEIGHT 1500g

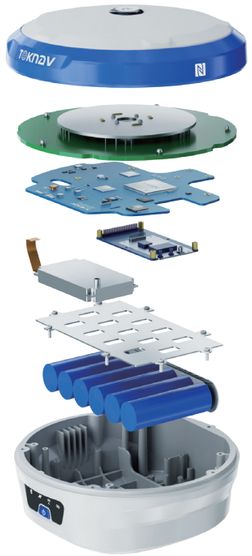
CHARACTERISTIC

Linux Smart System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.

Full System GNSS Reception

The receiver integrates a high-precision positioning module, utilizing 1408 channels to support a comprehensive range of signals including BDS B1I/B2I/B3I/B1C/B2a/B2b(PPP), GPS L1/L2/L5, GLONASS L1/L2/L3, Galileo E1/E5a/E5b/E6(PPP), and QZSS L1/L2/L5.



Extended Range and Battery Life

Features a built-in radio capable of 5W transmission and a 13800mAh battery, ensuring operational distances over 16km and continuous operation up to 12 hours.

Concurrent Data Links

The integrated 4G and 5W radio enables simultaneous network and radio differential transmission, streamlining operations by eliminating the need to choose between radio and network.

Remote VPN Management

With an integrated VPN, the device allows remote configuration of various functions without the need to return to the base station setup point, facilitating flexible adjustment of work requirements in complex environments.

IP68 Design

Industrial-grade design, robust magnesium alloy casing, meeting IP68 standards for durability and reliability.

TECHNICAL PARAMETERS

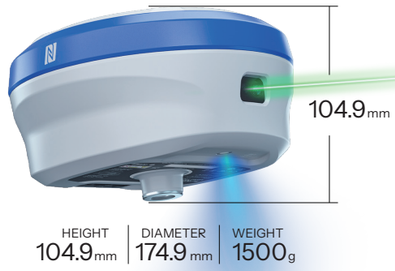
ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz	
OS		Linux	
GNSS	GPS	L1 C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Standard Output	NMEA-0183	
	Correction I/O Protocol	RTCM 3.X	
	Frequency	20Hz(max)	
	Reacquisition Time	<1s	
	Cold Start Time	<40s	
ACCURACY	SINGLE（RMS）	Horizontal: 1.5m ; Vertical: 2.5m	
	DGPS（RMS）	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK（RMS）	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Timing Precision（RMS）	20ns	
	Static Mode Precision（RMS）	Horizontal: ±(2.5mm+1ppm) Vertical: ±(5mm+1ppm)	
	Velocity Estimation（RMS）	0.03m/s	
	Tilt Correction（Within 60°）	<2cm	
SYSTEM PLATFORM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Radio	Integrated high-power transceiver Frequency Range: 410~470MHz Power: 1W/2W/5W Protocols: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT Air Baud Rate: 9600, 19200bps	
	Storage	32GB storage	
INDICATOR	Power Indicator	Indicates power and charging status	
	Differential Signal Indicator	Indicates differential signal transmission status	
	Satellite Indicator	Indicates satellite reception status	
	Bluetooth Indicator	Indicates Bluetooth connection status	
BATTERY/CHARGE	Capacity	7.2V, 13800mAh	
	Endurance	Over 12 hours (5W Radio, Base)	TBD
	Charging	Supports USB PD 15V/2A and 5V/3A	With adaptive dynamic current adjustment.
ENVIRONMENT	Operating Temperature	-20℃~+60℃	
	Storage Temperature	-40℃~+85℃	
	Shock Resistance	Can withstand a 1.5m drop at normal temperatures	
	Protection Rating	IP68	
PHYSICAL	Materials	Magnesium alloy casing with ABS/PC plastic top cover	
	Dimensions	Φ174.9 * 104.9mm	
	Weight	1500g	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

T30 GNSS Receiver

T30 is a fully-featured GNSS receiver designed for long battery life and high precision. It includes an advanced positioning module supporting full-system and multi-frequency satellite signal tracking. Equipped with 4G universal connectivity, Bluetooth, WiFi, a 5W data radio, and a large-capacity battery, it can operate continuously for up to two days on a single charge. The device integrates a high-precision inertial navigation system combined with AR and laser technology for AR stakeout and laser measurement, and augmented reality plotting, making surveying tasks more efficient and convenient.



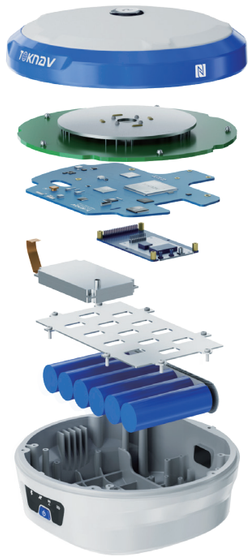
CHARACTERISTIC

Linux Smart System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.

Full System GNSS Reception

The receiver integrates a high-precision positioning module, utilizing 1408 channels to support a comprehensive range of signals including BDS B1I/B2I/B3I/B1C/B2a/B2b(PPP), GPS L1/L2/L5, GLONASS L1/L2/L3, Galileo E1/E5a/E5b/E6(PPP), and QZSS L1/L2/L5.



Full Netcom 4G Communication

Based on the Linux platform, this full netcom 4G solution supports mobile, Unicom, and Telecom 2/3/4G networks for better compatibility and stronger, more stable connections.

Laser Measurement

Equipped with a high-precision millimeter-level laser ranging module, combined with high-precision inertial navigation for accurate laser targeting in complex environments.

AR Real-Time Stakeout

Utilizes a professional ultra-wide-angle camera to provide high-definition real-time plotting functionality, making layout tasks more accurate and convenient.

IP68 Design

Industrial-grade design, robust magnesium alloy casing, meeting IP68 standards for durability and reliability.

TECHNICAL PARAMETERS

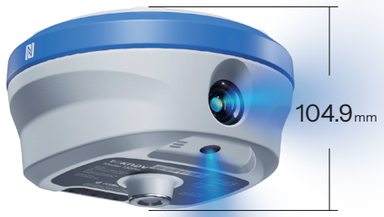
ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		**ARM Cortex-A7 1.8GHz**	
OS		**Linux**	
GNSS	GPS	L1 C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Standard Output	NMEA-0183	
	Correction I/O Protocol	RTCM 3.X	
	Frequency	20Hz(max)	
	Reacquisition Time	<1s	
	Cold Start Time	<40s	
ACCURACY	SINGLE（RMS）	Horizontal: 1.5m; Vertical: 2.5m	
	DGPS（RMS）	Horizontal: 0.4m; Vertical: 0.8m	
	RTK（RMS）	Horizontal: ±（8mm+1ppm） Vertical: ±（15mm+1ppm）	
	Timing Precision（RMS）	20ns	
	Static Mode Precision (RMS)	Horizontal: ±（2.5mm+1ppm） Vertical: ±（5mm+1ppm）	
	Velocity Estimation（RMS）	0.03m/s	
	Tilt Correction（Within 60°）	<2cm	
	Laser Measurement	The three-dimensional accuracy of laser tilt measurement within 5m: no more than 2.5cm	
SYSTEM PLATFORM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Radio	Integrated high-power transceiver Frequency Range: 410~470MHz Power: 1W/2W/5W Protocols: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT Air Baud Rate: 9600, 19200	
	Storage	32GB storage	
	AR Camera	Supports AR real scene stakeout Sensor size：1/2.8 inch Aperture：f/2.5 Resolution：1920*1080 Field of view：D70.3°H62.7°V38.6° Distortion：＜0.38%	
INDICATOR	Power Indicator	Indicates power and charging status	
	Differential Signal Indicator	Indicates differential signal transmission status	
	Satellite Indicator	Indicates satellite reception status	
	Bluetooth Indicator	Indicates Bluetooth connection status	
BATTERY/CHARGE	Capacity	7.2V, 13800mAh	
	Endurance	Over 48 hours(when applying controller network mode)	TBD
	Charging	Supports USB PD 15V/2A and 5V/3A	With adaptive dynamic current adjustment
ENVIRONMENT	Operating Temperature	-20℃~+60℃	
	Storage Temperature	-40℃~+85℃	
	Shock Resistance	Can withstand a 1.5m drop at normal temperatures	
	Protection Rating	IP68	
PHYSICAL	Materials	Magnesium alloy casing with ABS/PC plastic top cover	
	Dimensions	Φ174.9 * 104.9mm	
	Weight	1500g	

Equipped with electronic fence system, Toknav's product have area code restrictions. Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

T30Pro GNSS Receiver

The T30Pro is a GNSS receiver with a long battery life integrates AR and photogrammetry. It has a built-in high-precision positioning module that supports tracking all of the satellite signals. It is equipped with 4G Full Netcom, Bluetooth, Wi-Fi, a 5W data transmission radio. With a 7.2V, 13800mAh battery, it supports two days of operation after a single charge. The receiver also features a high-precision IMU module, Photogrammetry, and AR stakeout, further expanding the boundaries of RTK survey.



HEIGHT 104.9mm | DIAMETER 174.9mm | WEIGHT 1500g

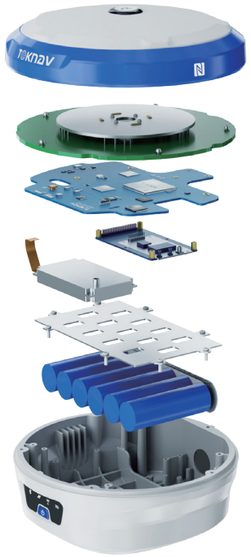
CHARACTERISTIC

Linux Smart System

Linux+ARM Cortex-A7 intelligent system platform offers efficient computation and unlimited product functionality expansion.

Full System GNSS Reception

The receiver integrates a high-precision positioning module with 1408 high-speed channels. It supports BDS B1I/B2I/B3I/B1C/B2a/B2b(PPP), GPS L1/L2/L5, GLONASS L1/L2/L3, Galileo E1/E5a/E5b/E6(PPP), QZSS L1/L2/L5 signals reception and calculation.



Tilt Measurement

T30Pro has the IMU module. Fast initialization and up to 60° inclination.

Photogrammetry

Equipped with a 1/2.6-inch large base high-definition wide-angle camera, it integrates high-precision inertial navigation algorithms and works with high-performance Android handheld devices for high-precision Photogrammetry.

AR Real-Time Stakeout

Utilizes a professional ultra-wide-angle camera to provide high-definition real-time plotting functionality, making layout tasks more accurate and convenient.

4G Full NetCom

The 4G NetCom solution based on the Linux platform fully supports 2/3/4G networks, offering better compatibility, stronger signals, and more stable connections.

TECHNICAL PARAMETERS

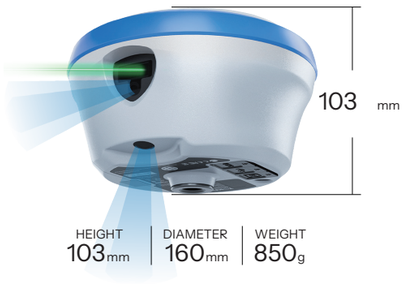
ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		**ARM Cortex-A7 1.8GHz**	
OS		**Linux**	
GNSS	GPS	L1 C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Standard Output	NMEA-0183	
	Correction I/O Protocol	RTCM 3.X	
	Frequency	20Hz(max)	
	Reacquisition Time	<1s	
	Cold Start Time	<40s	
ACCURACY	SINGLE（RMS）	Horizontal: 1.5m ; Vertical: 2.5m	
	DGPS（RMS）	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK（RMS）	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Timing Precision（RMS）	20ns	
	Static Mode Precision (RMS)	Horizontal: ±(2.5mm+1ppm) Vertical: ±(5mm+1ppm)	
	Velocity Estimation（RMS）	0.03m/s	
	Tilt Correction（Within 60°）	<2cm	
SYSTEM PLATFORM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Radio	Integrated receiver/transmitter Frequency Range: 410~470MHz Power: 1W/2W/5W Protocols: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT Air Baud Rate: 9600, 19200bps	
	Storage	32GB storage	
	Photogrammetry	Supports Photogrammetry Sensor size：1/2.6 inch Focal length：6 mm Aperture：f/2.8 Resolution：1920*1080 Field of view：D51.8°H42.4°V32.4° Distortion：＜0.5%	
	AR Camera	Supports AR real scene stakeout Sensor size：1/2.8 inch Aperture：f/2.5 Resolution：1920*1080 Distortion：＜0.38% Field of view：D70.3°H62.7°V38.6°	
INDICATOR	Power Indicator	Indicates power and charging status	
	Differential Signal Indicator	Indicates differential signal transmission status	
	Satellite Indicator	Indicates satellite reception status	
	Bluetooth Indicator	Indicates Bluetooth connection status	
BATTERY/CHARGE	Capacity	7.2V, 13800mAh	
	Endurance	Over 48 hours(when applying controller network mode)	
	Charging	Supports USB PD 15V/2A and 5V/3A	With adaptive dynamic current adjustment.
ENVIRONMENT	Operating Temperature	-20℃~+60℃	
	Storage Temperature	-40℃~+85℃	
	Shock Resistance	Can withstand a 1.5m drop at normal temperatures	
	Protection Rating	IP68	
PHYSICAL	Materials	Magnesium alloy casing with ABS/PC plastic top cover	
	Dimensions	Φ174.9 * 104.9mm	
	Weight	1500g	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

T40 GNSS Receiver

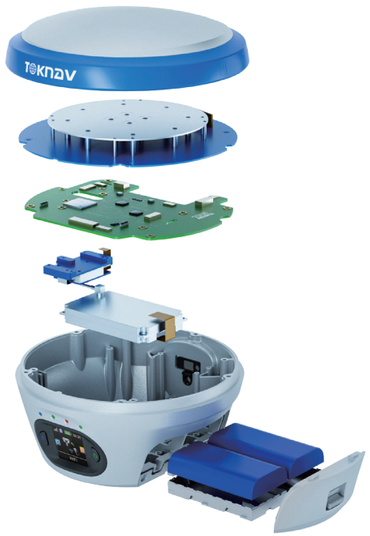
T40 is a versatile GNSS receiver equipped with dual-laser cameras. It integrates a high-precision positioning module, IMU, AR, laser technology, and laser visualization to enable high-precision positioning, tilt measurement, AR real-world staking, and visualized laser point measurement. It boasts a maximum testing radius of up to 30 meters. The receiver features a robust magnesium-aluminum alloy design, offering durability and reliability. It supports hot-swappable batteries, allowing quick recharging without power interruption, thereby extending operational time.



CHARACTERISTIC

Full-System, Multi-Frequency GNSS Receiver

The receiver integrates a high-precision positioning module with 1,408 high-speed channels. It supports full-system and multi-frequency signal reception and processing, including: BDS: B1I, B2I, B3I, B1C, B2a, B2b, GPS: L1 C/A, L1C, L2C, L5, GLONASS: L1, L2, L3, Galileo: E1, E5a, E5b, E6, QZSS: L1, L2, L5, SBAS and NavIC systems.



Tilt Measurement

Equipped with an intelligent high-precision inertial navigation (IMU) module, the device offers real-time tilt compensation, eliminating the issue of "floating points" in RTK surveys.

AR Stake Out

A professional ultra-wide-angle camera provides HD real-world stake out capabilities. Its user-friendly AR stake out application ensures precise, one-shot staking performance.

Visualized Laser Measurement

Featuring a high-precision, millimeter-grade laser ranging module and a high-definition camera, the receiver enables precise point-and-measure functionality. The combination of high-accuracy inertial navigation and the camera's HD visuals ensures seamless operation even in complex environments.

Extended Battery Life

The receiver supports two detachable batteries that allow hot-swapping without power interruption. This enables quick battery replacement, significantly extending operational endurance.

TECHNICAL PARAMETERS

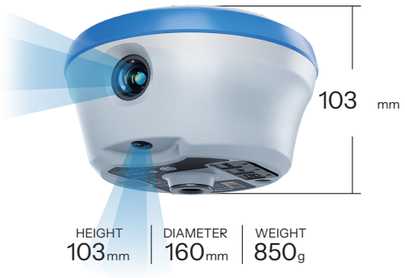
ITEM		SPECIFICATION	REMARKS
Hardware Platform		**ARM Cortex-A7**	
Software Platform		**Linux**	
GNSS	GPS	L1 C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC(IRNSS)	L5	Requires firmware support
	Channels	1408	
	Data Format	NMEA-0183	
	I/O Protocol	RTCM3.X	
	Data Update Frequency	20Hz max	
	Reacquisition Time	<1s	
	Cold Start Time	<40s	
POSITIONING ACCURACY	SINGLE(RMS)	Horizontal: 1.5m ; Vertical: 2.5m	
	DGPS(RMS)	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK(RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Time Accuracy(RMS)	20ns	
	Static(RMS)	Horizontal: ±(2.5mm+1ppm) Vertical: ±(5mm+1ppm)	
	Speed Accuracy(RMS)	0.03m/s	
	Tilt Compensation (≤60°)	<2cm	
	AR Stake Out Accuracy	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Laser Measurement	≤2.5cm 3D error within 5m range	
SYSTEM	Blue Tooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n/ac	
	Network	LTE FDD:B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Radio	Integrated receiver/transmitter Frequency Range: 410~470MHz Power: 1W/2W/5W Air Baud Rate: 9600, 19200 Protocols: TRIMTALK,TRIMMK3,SOUTH,TRANSEOT	
	Storage	32GB	
	Laser Module	Type: Class 3R Range: 30m Precision: ±5mm±100*10-6*D，(D: Measurement Distance) Wavelength: 520±20nm Power: 3.8mW	
	Laser Assist Camera	Sensor：1/3.06 inch Resolution: 4224x3200 FOV: D44°H35°V26.5° Distortion: ＜1%	
	AR Camera	AR Stakeout Supported Sensor: 1/2.8 inch Aperture: f/2.5 Resolution: 1920*1080 FOV: 70.3°H62.7°V38.6° Distortion: ＜0.38%	
BATTERY	Work time	Over 20 hours (when applying controller network mode)	
	External power	9~24VDC	
	Battery	7.2V，3400mAh *2	Removable battery, dedicated charger
ENVIRONMENT	Work Temperature	-20°C~+60°C	
	Storage Temperature	-20°C~+70°C	
	Shock Resistance	Can withstand a 1.5m drop at normal temperatures	
	Protection Rating	IP68	
PHYSICAL	Materials	Magnesium alloy main body, ABS/PC top cover	
	Dimensions	Φ160mm*103mm	
	Weight	850g(without battery)	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

T40Pro GNSS Receiver

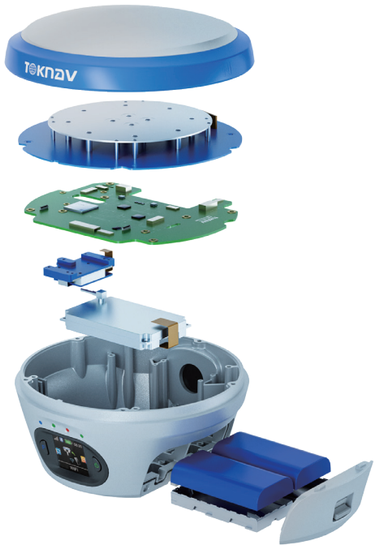
The T40Pro is a versatilel GNSS receiver equipped with photogrammetry technology. It integrates a high-precision positioning module, IMU, AR, and a high-definition imaging camera, combining precise inertial navigation and positioning data. It enables tilt measurement, AR real-time staking, and image-based survey, allowing for efficient extraction of high-precision coordinates from real-world images. The receiver features a robust magnesium-aluminum alloy design, offering durability and reliability. It supports hot-swappable batteries, allowing quick recharging without power interruption, thereby extending operational time.



CHARACTERISTIC

Full-System, Multi-Frequency GNSS Receiver

The receiver integrates a high-precision positioning module with 1,408 high-speed channels. It supports full-system and multi-frequency signal reception and processing, including: BDS: B1I, B2I, B3I, B1C, B2a, B2b, GPS: L1 C/A, L1C, L2C, L5, GLONASS: L1, L2, L3, Galileo: E1, E5a, E5b, E6, QZSS: L1, L2, L5, SBAS and NavIC systems.



Tilt Measurement

Equipped with an intelligent high-precision inertial navigation (IMU) module, the device offers real-time tilt compensation, eliminating the issue of “floating points” in RTK surveys.

AR Stake Out

A professional ultra-wide-angle camera provides HD real-world stake out capabilities. Its user-friendly AR stake out application ensures precise, one-shot staking performance.

Photogrammetry

The receiver is equipped with a high-definition wide-angle camera with a large 1/2.6-inch sensor, integrating high-precision inertial navigation algorithms. Coupled with a high-performance Android controller, it achieves high-precision Photogrammetry.

Extended Battery Life

The receiver supports two detachable batteries that allow hot-swapping without power interruption. This enables quick battery replacement, significantly extending operational endurance.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
Hardware Platform		**ARM Cortex-A7**	
Software Platform		**Linux**	
GNSS	GPS	L1 C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC(IRNSS)	L5	Requires firmware support
	Channels	1408	
	Data Format	NMEA-0183	
	I/O Protocol	RTCM3.X	
	Data Updat Frequency	20Hz max	
	Reacquistion Time	<1s	
	Cold Start Time	<40s	
POSITIONING ACCURACY	SINGLE(RMS)	Horizontal: 1.5m ; Vertical: 2.5m	
	DGPS(RMS)	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK(RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Time Accuracy(RMS)	20ns	
	Static(RMS)	Horizontal: ±(2.5mm+1ppm) Vertical: ±(5mm+1ppm)	
	Speed Accuracy(RMS)	0.03m/s	
	Tilt Compensation(60°)	<2cm	
	AR Stakeout Accuracy	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Photogrammetry Accuracy	Error of 2-4 cm within 2-15 meters.	
SYSTEM	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n/ac	
	Network	LTE FDD:B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Radio	Integrated receiver/transmitter Frequency Range: 410~470MHz Power: 1W/2W/5W Air Baud Rate: 9600, 19200 Protocols: TRIMTALK, TRIMMK3, SOUTH, TRANSEOT	
	Storage	32GB	
	Photogrammetry Camera	Supports Photogrammetry Sensor size: 1/2.6 inch Focal length: 6mm Aperture: f/2.8 Resolution: 1920*1080 Distortion: < 0.5% Field of view: D51.8° H42.4° V32.4°	
	AR Camera	AR Stakeout Supported Sensor: 1/2.8 inch Aperture: f/2.5 Resolution: 1920*1080 FOV: 70.3°H62.7°V38.6° Distortion: ＜0.38%	
DISPLAY	LCD Panel	Sensor: 1.3 inch Resolution: 240*RGB*240	
BATTERY	Battery	7.2V，3400mAh *2	Removable battery, dedicated charger
	Work time	Over 20 hours (when applying controller network mode)	
	External power	9~24VDC	
ENVIRONMENT	Work Temperature	-20°C~+60°C	
	Storage Temperature	-20°C~+70°C	
	Shock Resistance	Can withstand a 1.5m drop at normal temperatures	
	Protection Rating	IP68	
PHYSICAL	Materials	Magnesium alloy main body, ABS/PC top cover	
	Dimensions	Φ160mm*103mm	
	Weight	850g(without battery)	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

NET660 GNSS Receiver

NET660 GNSS receiver is a high-performance device engineered specifically for the construction of ground-based enhancement systems, such as those used with the Beidou navigation satellite system. It boasts an built-in Linux operating system and fully independent intellectual property rights. Its diverse interfaces and communication methods, along with support for event inputs, PPS outputs, and substantial data storage, make it an ideal choice for foundational system construction.

WIDTH	HEIGHT	LENGTH	WEIGHT
148 mm	58mm	172 mm	1920g

CHARACTERISTIC

Linux Intelligent System

Utilizing a Linux + ARM Cortex-A7 system platform, the NET660 offers efficient computation and endless possibilities for product function expansion.

Comprehensive GNSS Receiver

The device integrates a high-precision positioning module capable of receiving and processing signals from a full array of systems and frequencies, including BDS (B1I/B2I/B3I, B1C/B2a/B2b), GPS (L1CA/L2P/L2C/L5), GLONASS (G1/G2), Galileo (E1/E5a/E5b), QZSS, SBAS, and IRNSS, providing complete system and full-frequency signal reception and solution.

Advanced Positioning Capabilities

Features narrowband interference resistance and continuous wave interference suppression, enabling rapid initial positioning and fast satellite signal lock for quick and precise data acquisition necessary for subsequent processing.

Versatile Connectivity Options

Offers Ethernet, WiFi, serial ports, Bluetooth, and mobile network interfaces, allowing for flexible connectivity solutions.

Protocol Compatibility

Supports a variety of protocols including Ntrip Client/Server/Caster, TCP Client/Server, FTP for file transfers, and HTTP/HTTPS for secure communications over protected networks.

IP68 Design

Features a robust aluminum alloy casing, designed to meet IP68 standards for durability and reliability, ensuring safe and dependable operation in challenging environment.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		**ARM Cortex-A7 1.8GHz**	
OS		**Linux**	
GNSS	GPS	L1 C/A, L2P(Y), L2C, L5	
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b	
	QZSS	L1 C/A, L2C, L5	
	SBAS	L1 C/A	
	NavIC (IRNSS)*	L5*	Requires firmware support
	L-band		
	Standard Output	NMEA-0183	
	Correction I/O Protocol	RTCM 3.X	
	Frequency	1Hz, 2Hz, 5Hz, 10Hz, 20Hz max	
	Reacquisition Time	<1s	
	Cold Start Time	<40s	
ACCURACY	SINGLE（RMS）	Horizontal: 1.5m ; Vertical: 3m	
	DGPS（RMS）	Horizontal: 0.4m ; Vertical: 0.8m	
	RTK（RMS）	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Timing Precision（RMS）	20ns	
	Static Mode Precision (RMS)	Horizontal: ±(2.5mm+1ppm) Vertical: ±(5mm+1ppm)	
	Data Availability	≥98% (Available data/Collected data)	
	Data Completeness	≥98% (Collected data/Expected data to be collected)	
INTERFACE	Bluetooth	BR+EDR+BLE	
	WIFI	802.11 b/g/n	
	Network	Full frequency LTE FDD:B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	Mini SIM Card
	Ethernet Port	Standard RJ45 interface, 10/100M adaptive	
	Serial Ports	Two 5-pin connectors; standard RS232 interface with baud rates supporting 9600, 19200, 38400, 115200, and 230400 bps	
	Storage	32GB storage	
INDICATOR	LCD Display	Size: 1.3inch Resolution: 240*RGB*240	Full View
	Power Indicator	Indicates power and charging status	
	Differential Signal Indicator	Indicates the status of network connection	
	Satellite Indicator	Indicates satellite reception status	
	Bluetooth Indicator	Indicates Bluetooth connection status	
BATTERY/CHARGE	Capacity	7.2V, 13800mAh	
	Endurance	Over 24 hours Supports continuous data collection for 26 hours on a full charge	TBD
	Charging	TYPEC - USB PD 15V/2A 5V/3A LEMO - 12V/2A DC Input supported	With adaptive dynamic current adjustment.
ENVIRONMENT	Operating Temperature	-20℃~+60℃	
	Storage Temperature	-20℃~+70℃	
	Shock Resistance	GB/T2423	
	Protection Rating	IP68	
PHYSICAL	Materials	Aluminum alloy shell	
	Dimensions	172 * 148 * 58mm	
	Weight	1920g	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

NET660i GNSS Receiver

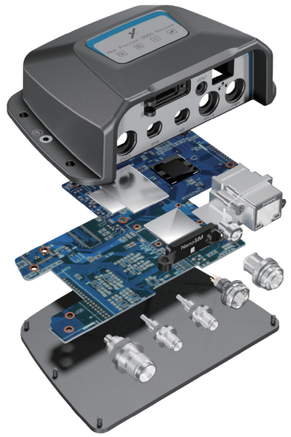
NET660i is a cost-effective and miniaturized GNSS receiver designed for the construction of Beidou ground-based augmentation system. It has built-in Linux operating system, completely independent intellectual property development, rich interface types, diverse communication methods, and supports large-capacity data storage. It is the best choice for the construction of the Beidou ground-based augmentation system.

WIDTH	HEIGHT	LENGTH	WEIGHT
105 mm	50.3mm	148.8mm	490g

CHARACTERISTIC

Linux Intelligent System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.



Multi Constellation

With its 1408 channels, NET660i provides an excellent on board real time navigation solution with high accuracy. All GNSS signals (GPS, GLONASS, BDS, GALILEO, QZSS, SBAS) are included.

Rich Interfaces and Various Communication Methods

NET660i provides Ethernet, serial and mobile network interfaces for customers to choose.

Compatible with Multiple Protocols

NET660i supports Ntrip Client/Server/Caster, TCP Client/Server connection, FTP protocol file transfer, HTTP/HTTPS protocol, private network transfer function with protection policy.

Cloud Service Function

NET660i can regularly report the device status such as device location, network status, signal strength, satellite reception status, etc., and supports cloud platform to restart, reset, and upgrade the remote device.

Support Front-end Solution

NET660i supports the front-end calculation function which can complete the static data calculation on the device inside and upload the results to the cloud, which greatly reduces the requirements for the computing power of the cloud server.

IP68 Design

Industrial design, solid magnesium alloy shell, in line with IP68 design requirements, safe and reliable.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		**ARM Cortex-A7 1.8GHz**	
OS		**Linux**	
GNSS	GPS	L1C/A, L1C, L2P(Y), L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2, L3	
	BDS	B1I, B2I, B3I, B1C, B2a, B2b	
	GALILEO	E1, E5a, E5b, E6	
	QZSS	L1, L2, L5	
	SBAS	L1	
	NavIC (IRNSS)*	L5*	Requires firmware support
	Channel	1408	
	Differential Observation Accuracy (RMS)	10.0cm	
	Kinematic Phase Observation Accuracy (RMS)	1.0cm	
	Data format	RINEX, Custom	
	Position Data	NMEA-0183	
	Differential Data	RTCM 3.X	
	Data update frequency	1Hz, 2Hz, 5Hz, 10Hz, 20Hz	
	Receive Data Availability	⩾98%(Data available/Data collected)	
	Data Integrity	⩾98%(Data collected/Data should be collected)	
	Single (RMS)	Horizontal: 1.5m Vertical: 2.5m	
	RTK(RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Static Accuracy (RMS)	Horizontal: ±(2.5mm+0.5ppm) Vertical: ±(5mm+0.5ppm)	
	Time Accuracy (RMS)	20ns	
SYSTEM	Serial Port	Standard RS232 interface, Baud rate supports 1200, 2400, 4800, 9600, 19200, 38400, 115200, 230400bps	
	Network port	Standard RJ45 interface, 10/100Mbps network adaptive	
	USB	Integrated on the 7-pin interface, support access to the computer to copy data directly	
	Network Communication (Full Netcom)	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Interface	PWE*1: Power supply port DATA*1 PPS* 1 SIM*1: Nano SIM card Ethernet*1 GNSS*1: Main antenna 4G*1: 4G antenna port	
	Storage	32GB storage, circular storage support multi-channel storage	
ELECTRICAL CHARACTERISTIC	Voltage Input	9-24V DC (12V typical)	
	Power Dissipation	1.8W(typ)	
ENVIRONMENT	Operating Temperature	-40~+85℃	
	Storage Temperature	-40~+85℃	
	Protection Class	IP68	
PHYSICAL	Material	Magnesium alloy main body	
	Dimension	148.8mm * 105mm* 50.3mm	
	Weight	490g	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

NET660i-H GNSS Receiver

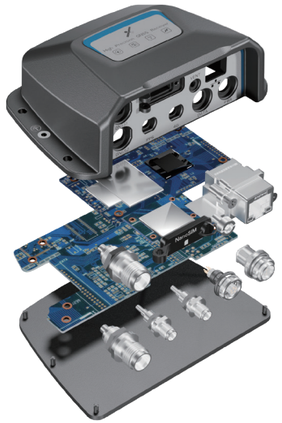
NET660i-H is a cost-effective and miniaturized GNSS receiver designed for the construction of Beidou ground-based augmentation system. It has built-in Linux operating system, completely independent intellectual property development, rich interface types, diverse communication methods, and supports large-capacity data storage. NET660i-H supports full system and frequency, and dual-antenna directed positioning solution with dual-antenna independent differential output capability. It is the best choice for the construction of the mechanical intelligent control system.

WIDTH	HEIGHT	LENGTH	WEIGHT
105 mm	50.3mm	148.8mm	490g

CHARACTERISTIC

Linux Intelligent System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.



Multi Constellation

With its 1408 channels, NET660i-H provides an excellent on board real time navigation solution with high accuracy. All GNSS signals (GPS, GLONASS, BDS, GALILEO and QZSS) are included.

Rich Interfaces and Various Communication Methods

NET660i-H provides Ethernet, serial and mobile network interfaces for customers to choose.

Compatible with Multiple Protocols

NET660i-H supports Ntrip Client/Server/Caster, TCP Client/Server connection, FTP protocol file transfer, HTTP/HTTPS protocol, private network transfer function with protection policy.

Cloud Dervice Function

NET660i-H can regularly report the device status such as device location, network status, signal strength, satellite reception status, etc., and support cloud platform to restart, reset, and upgrade the remote device.

Support Front-End Solution

NET660i-H supports the front-end calculation function, which can complete the static data calculation on the device inside and upload the results to the cloud, which greatly reduces the requirements for the computing power of the cloud server.

IP68 Design

Industrial design, solid magnesium alloy shell, in line with IP68 design requirements, safe and reliable.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		**ARM Cortex-A7 1.8GHz**	
	OS	**Linux**	
GNSS	GPS	L1C/A, L2P/L2C, L5	PPP-B2b, PPP-E6, SBAS supported
	GLONASS	L1, L2	
	BDS	B1I, B2I, B3I, B1C*, B2b*	
	GALILEO	E1, E5a, E5b, E6*	
	QZSS	L1, L2, L5	
	SBAS	L1C/A	
	Channel	1408	
	Differential Observation Accuracy (RMS)	10.0cm	
	Kinematic Phase Observation Accuracy (RMS)	1.0cm	
	Data format	RINEX, Custom	
	Position Data	NMEA-0183	
	Differential Data	RTCM 3.X	
	Data update frequency	1Hz, 2Hz, 5Hz, 10Hz, 20Hz	
	Receive Data Availability	⩾98%(Data available/Data collected)	
	Data Integrity	⩾98%(Data collected/Data should be collected)	
	Single (RMS)	Horizontal: 1.5m ; Vertical: 2.5m	
	RTK(RMS)	Horizontal: ±(8mm+1ppm) Vertical: ±(15mm+1ppm)	
	Static Accuracy (RMS)	Horizontal: ±(2.5mm+0.5ppm) Vertical: ±(5mm+0.5ppm)	
	Time Accuracy (RMS)	20ns	
	Heading Accuracy (RMS)	0.2°/m	
SYSTEM	Serial Port	Standard RS232 interface, Baud rate supports 1200, 2400, 4800, 9600, 19200, 38400, 115200, 230400bps	
	Network port	Standard RJ45 interface, 10/100Mbps network adaptive	
	USB	Integrated on the 7-pin interface, support access to the computer to copy data directly	
	Network Communication (Full Netcom)	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Interface	PWE*1: Power supply port DATA*1 PPS*1 SIM*1: Nano SIM card Ethernet*1 GNSS*2: TCN port 4G*1: 4G antenna port	
	Storage	32GB, circular storage support multi-channel storage	
ELECTRICAL CHARACTERISTIC	Voltage Input	9-24V DC (12V typical)	
	Power Dissipation	2W (typical)	
ENVIRONMENT	Operating Temperature	-40~+85℃	
	Storage Temperature	-40~+85℃	
	Protection Class	IP68	
PHYSICAL	Material	Magnesium alloy main body	
	Dimension	148.8mm * 105mm * 50.3mm	
	Weight	490g	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

NET660i-1U GNSS Receiver

NET660i-1U is a high-performance, compact GNSS receiver designed for unmanned vehicles. It features the latest high-performance automotive-grade positioning chip, an integrated MEMS inertial measurement unit, and a functional safety processor. The receiver supports high-performance RTK positioning and deeply coupled navigation algorithms, effectively addressing challenges such as satellite signal interference, blockage, and multipath effects. It provides continuous, real-time, and reliable high-precision position and posture information, suitable for applications in intelligent driving, precision agriculture, and intelligent robotics.

WIDTH	HEIGHT	LENGTH	WEIGHT
105 mm	50.3mm	148.8mm	490g

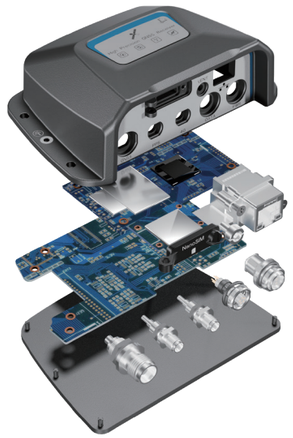
CHARACTERISTIC

Linux Intelligent System

ARM Cortex-A7 + Linux, the intelligent system platform, brings efficient computing and unlimited expansion of product functions to users.

All-System Multi-Frequency GNSS Receiver

Integrated high-precision positioning module with fully independent intellectual property rights, supporting: BDS B1I, B2I, B3I, B1C*, B2a, B2b*(PPP), GPS L1C/A, L1C*, L2, L5, GLONASS L1, L2, Galileo E1, E5a, E5b, E6*, SBAS L1C/A, QZSS L1C/A, L2, L5, L6(CLAS*)



Compatible with Multiple Protocols

NET660i-1U supports Ntrip Client/Server/Caster, TCP Client/Server connections, FTP file transfer, HTTP/HTTPS, and MQTT transmission.

Built-in Deeply Coupled Navigation Algorithm

Integrated MEMS inertial measurement unit enables dead reckoning, providing continuous high-precision position and speed information even during short-term obstructions. The deeply coupled navigation algorithm improves GNSS signal quality, enhancing positioning accuracy in urban canyons by 2-5 times compared to loosely coupled algorithms.

Cloud Service Functionality

The device can regularly report the device status such as device location, network status, signal strength, satellite reception status, etc., and support cloud platform to restart, reset, and upgrade the remote device.

IP68 Design

Industrial design, solid magnesium alloy shell, in line with IP68 design requirements, safe and reliable.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION	REMARKS
HARDWARE SYSTEM		ARM Cortex-A7 1.8GHz	
OS		Linux	
GNSS	GPS	L1C/A, L1C*, L2, L5	PPP-B2b,PPP-E6 SBAS supported Marked * indicates firmware support is required
	GLONASS	L1, L2	
	BDS	B1I, B2I, B3I, B1C*, B2a, B2b*	
	GALILEO	E1, E5a, E5b, E6*	
	QZSS	L1C/A, L2, L5, L6 (CLAS*)	
	SBAS*	L1C/A	
	NavIC (IRNSS)*	L5*	
	Channel	1507	
	Pseudorange Observation Accuracy	≤10.0cm	
	Carrier Phase Observation Accuracy	≤1.0mm	
	Single Accuracy (RMS)	Horizontal: 1.5m ; Vertical: 2.5m	
	RTK Accuracy (RMS)	Horizontal: ±(10mm+1ppm) ; Vertical: ±(15mm+1ppm)	
	Static Accuracy (RMS)	Horizontal: ±(2.5mm+1ppm) Vertical: ±(5mm+1ppm)	
	Time Accuracy (RMS)	≤20ns (It does not include delays caused by RF cables or antennas)	
	Position Data	NMEA-0183	
	Differential Data	RTCM 3.X	
	Data format	RINEX, Custom	
	Data update frequency	RTK: 2Hz, 5Hz (Turn off Integrated Navigation) IMU: 50/100Hz	
IMU	IMU parameters	Gyroscope Range: ±300°/s Full temperature zero deviation: 0.3°/s Scale error: 4‰ Three-axis orthogonal coupling error: 1.7% (0.1°)	
	Accelerometer	Measuring range: ±16g Full temperature zero deviation: 5mg Scale error: 2% Three-axis orthogonal coupling error: 0.9% (0.05°)	
SYSTEM	Serial Port	Standard RS232 interface, Baud rate supports9600, 19200, 38400, 115200, 230400bps	
	Network port	Standard RJ45 interface, 10/100Mbps network adaptive	
	USB	Integrated on the 7-pin interface, support access to the computer to copy data directly	
	Network Communication	LTE FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28 LTE TDD: B38/39/40/41 WCDMA: B1/2/4/5/6/8/19 GSM: B2/3/5/8	
	Interface	PWR*1: Power supply port DATA*1 PPS*1 SIM*1: NanoSIM card Ethernet*1 GNSS*1: Main antenna 4G*1: 4G antenna port	
	Storage	32GB,circular storage support multi-channel storage	
ELECTRICAL CHARACTERISTIC	Voltage Input	9-24V DC (12V typical)	
	Power Dissipation	1.8W	
ENVIRONMENT	Operating Temperature	-40~+85℃	
	Storage Temperature	-40~+85℃	
	Protection Class	IP68	
PHYSICAL	Material	Magnesium alloy main body	
	Dimension	148.8mm*105mm*50.3mm	
	Weight	490g	

Equipped with electronic fence system, Toknav's product have area code restrictions.
Any issue please contact Toknav or local dealers to verify the specific details.

Manufacturers may update parameters at any time, please refer to the latest product information.

External Digital Radio DL8635

TOKNAV external digital radio provides reliable data communications for mission-critical applications where a combination of stability and long range are required. The DL8635 radio is the latest fully compatible protocol radio station of TOKNAV. With professional IP67 rating, it is robust and reliable, suitable for various outdoor harsh environment. Its adjustable multiple transmit power can easily achieve stable transmission over long distance of 30km.

WIDTH	HEIGHT	LENGTH	WEIGHT
130 mm	175mm	86.5 mm	2000 g

CHARACTERISTIC

Intelligent Serial Baud Rate Identification

The DL8635 radio can intelligently identify the serial port baud rate. Interconnection between different RTK devices can be achieved without additional configuration.

Multi-Operating Mode Identify

It offers surveyors an easy-to-use radio modem that provides dependable performance as either a base, or repeater working with other radio modems in challenging environments. In the store and forward operating mode, Digital Radio receives messages, buffers the received data, and transmits further to another substation.

Convenient Mobile App Operations

The user-programmable Digital Radio also supports the Bluetooth of APP to configure data and updates radio status. Its diagnostic reporting software can realize the built-in reliability monitoring, such as internal temperature, environment status, battery level and channel inspection etc. These features allow users to both anticipate and deal with potential issues efficiently.

Compatible with Multiple Protocols

Compatible communication protocols of ETALK, TRIMTALK™, TRIMMARK™3, Transparent-EOT, SATEL®

IP67 Design

Industrial design, solid magnesium alloy shell, in line with IP67 design requirements, safe and reliable.

Adjustable Multiple Transmit Power

The Radio supports H/M/L three level transmission power(customized), three power levels adjustable from 5W to 28W.

TECHNICAL PARAMETERS

ITEM		SPECIFICATION
GENERAL	Frequency	410MHz~470MHz
	Operating Mode	Transceiver Transmitter Radio Repeater Network Repeater
	Channel Width	12.5KHz/25KHz
	Channels	Up to 32 programmable channels (user selectable)
	Frequency Stability	<±1ppm
POWER	Operating Voltage	9V~16V
	Power Consumption (Typical)	Transmit Output Power H: (28W) 78W@12V DC Transmit Output Power M: (22W) 60W@12V DC Transmit Output Power L: (5W) 35W@12V DC Sleep State 2W@12V DC
MODEM	Data Rate	4800bps/9600bps/19200bps
	Data Speed of Serial Interface	9600, 19200, 38400, 57600, 115200bps
	Modulation	GMSK/4FSK
TRANSMITTER	RF Output Power	H: 28W 44.5±0.5dBm @DC 12V M: 22W 43.4±0.5dBm @DC 12V L: 5W 37±1dBm @DC12V ±1dB
	RF Power Stability	±1dB
RECEIVER	Sensitivity	<-114dBm@BER 10^{-3}, 9600bps
DATA COMMUNICATION	Bluetooth	Built-in Bluetooth Antenna Bluetooth Version: 2.0/4.0
ENVIRONMENTAL	Protection	IP67
	Operating Temperature	-40℃ ~ +65℃
	Storage Temperature	-50℃ ~ +85℃
PHYSICAL	Dimension (H*W*D)	175mm*130mm*86.5mm
	Weight	2000g
	Data Connector	LEMO 5pin
	Connector	TNC female

Manufacturers may update parameters at any time, please refer to the latest product information.