E300 Pro GNSS Receiver

User Manual



V1.0_201912

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1. Introduction

This is the user manual for survey E300 Pro GNSS receiver. It gives basic description and operation guide which may help user to operate device properly.

1.1 Appearance

The E300 Pro main body is designed with magnesium alloy material to provide durable usage and better heat dispersion as well as light weight 940g. The internal battery ensures up to 12-hours continuous working.



1.2 Indicator

Working status is viewable through the indicators. The meaning of each indicator:



Indicator	Color	Meaning
Battery	Green and Red	 Solid green: battery level between 30%~100%
		Flash green: battery level between
		10%~30%, speaker will beep
		Flash red: battery level below 10%
Bluetooth	Blue	Off: no Bluetooth connection
*		Solid blue: has Bluetooth connection
Data link	Green and Blue	 Solid green: datalink is ready to start
<u>I</u> t		Flash green: datalink is transmitting data normally
D		• Flash Blue: when raw data recording is
		enabled, the LED will flash according to the
		interval
Satellite	Green and Red	Off: no receiving satellites
2		• Flash red: receiving satellites but no
D		solution status
		Flash green: have solution but not fixed
		Solid green: fixed solution
		Flash red and green alternately: mainboard abnormal

1.3 Interface

E300 Pro GNSS receive bottom interface is shown as below. The 5-pin port is used to connect external radio and external power, or output NMEA messages. Type-C port can be used for data download (internal storage access) or charging.



1.4 Pin definition

The 5-pin port is defined as below:



		1	+12V	Power
		2	GND	Power ground
5 Pin	(3)	3	TXD	Device out
		4	SGD	Signal ground
	Front View	5	RXD	Device in

1.5 Power button

There is a power button on E300 Pro control panel, the main function as below:

Power On	Long press button for three seconds to power on receiver, all the indicators will on.
Power Off	Long press button for two seconds then release, will hear the voice "Power off?" Then press the button again to confirm.

Broadcast Current Working	Receiver will broadcast current working mode
Mode	when press the power button.
	Long press button for two seconds then release,
Solf chook	will hear the voice "Power off?" Then long press
Sen-check	button for three seconds, will hear the voice "self-
	check".
Check the bettery Level	Press power button, battery indicator will show
Check the battery Level	the battery level.

2. Web User Interface

User can connect to receiver WIFI hotspot with PC, smart phone or tablet. The hotspot name is the device serial number, can be found under the bottom of the device label. Open web browser and input the IP address "192.168.10.1". The default password is "password". From the website, user can manage working status, change working mode, configurate basic settings, download raw data, update firmware and register device.



2.1 Position

View basic position information, satellite number, PDOP and time. In static mode, can start and stop recording here.

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● 1007 he west × + 2 ● 00 0 Not server 192.165.10.1/main.php?action-purge E3000 Pro E30093A1900010 • ## Status • Postion • • Status 1000 • Basilink • • Hopt: 60.02 m • • Status 1000 • • Status 1000 • • Hopt: 60.02 m • • Status 1000 • • Hopt: 60.02 m • • Status 1000 • • Hopt: 60.02 m • • Status 1000 • • HopP: 0.002 m • • HopP: 0.001 • <t< th=""><th>English</th></t<>		English		
Status Position	~	• Syntem Mode: Rover • Longitude: 121 530082452 * • Laittude: 31 034418217 *		中文 English 한국어 Português Pyccanit
Datalink Satellites Information		- Height 60.042 m - Status: Single - Satellites: 31 (GPS: 9, BeDOx: 17, GLONASS; 5] - POQP: 0.902 - HOQP: 0.902		Türkçe 日本語
© Settings	~	• TDOP: 0.511		
Working Mode Satellite Settings Device Configurativ NMEA Message View Logs Configuration Set	on	- HR835 1013 - VR835 142 - Local Time: 2019-12-23 13.19.47 - UTC Time: 2019-12-23 05.19.47		
Download	► Napurge#			

2.2 Satellites

View satellite list and satellite map, set cut-off angle.

S E300 Pro Web UI	+		-	•	٥	×
⊢ → C ① Not secu	e 192.168.10.1/main.php?action=purge	合	Л		0	:
E300 Pro E30P3A1900	010			Engl	ish	
🖬 Status 👻						
Position	Cutoff Angle 5 * (0-45) Submit					
Datalink	Satellites Table * Satellites Skypiot					
Satellites	23					
Information						
♦ Settings	5 ¹⁰ 01					
Working Mode						
Satellite Settings	â 🙂 🖓 👘 👘					
Device Configuration						
NMEA Message						
View Logs	W ² ₂					
Configuration Set						
🛓 Download 🔹 🗸						
Raw Data						

2.3 Information

View receiver information: firmware version, GNSS board, and network module.

E300 Pro E30P3A19	00010		English -
Status	Receiver:		
Position	Device Model: E300 Pro	Serial No.: E30P3A1900010	
Position	Hardware Version: V1.1	BOOT Version: 1.01	
Datalink	Firmware Version: 0.22.191217A	OS Version: 1.04	
	MCU Version: 2.54	Sensor Version: 1.1.2	
Satellites	Battery Power: 36%	Power Source: battery	
Information	Data Memory: Internal Storage Total 6.74 GB; Free 6.74 GB	Manufacture Date: 2019-12-01	
🗘 Settings	Antenna:		
	Antenna Type: EE300SX113A	R: 785	
Working Mode	H: 398	HL1: 317	
Satellite Settings	HL2: 225		
Device Configuration	GNSS Board:		
NMEA Message	GNSS Model: P20	GNSS Serial: 21800027	
	GNSS Hardware Version: 1	GNSS BOOT Version: N/A	
View Logs	GNSS Firmware Version: 6.0Aa00x6		
Configuration Set	Maturatio		
J. Download	NETWORK Model: EG25-G	IMEI: 867698040302898	
	Firmware Version: EG25GGBR07A07M2G	Local IP:	
Raw Data	Network Provider: Undefined	Network Type:	
Backup Data	Signal Level:	Protocol: NTRIP	
	Caster Address:	Mountpoint: RTCM32	
Management			
	UHF:		
	Radio Model: TRM101	Serial: TRU119111819	
	Firmware Version: G001.02.16Q	Channel: 1 [441.000 MHz]	
	Radio Protocol: TrimMark III		

2.4 Working Mode

Configurate working mode: base, rover or static.

E300 Pro Web UI	×	+		- 0
\rightarrow C \bigcirc \bigcirc	Not secure	192.168.10.1/main.php?action=purge	÷	1 🖷 Օ
300 Pro E30P	3A19000	10		English
Status	~	System Mode	Static Rover Base	
Position		Current Datalink	UHF O Network External O Bluetooth	
Datalink			🗎 Artk	
Satellites		Record Raw Data	NO S VES	
Information				
Settings	~	Radio Channel	1.	
Working Mode			441.000 MHz Default Frequency	
Satellite Settings		Radio Protocol	TrimMark III •	
Device Configuration	1		FEC:OFF	
NMEA Message		Save	Cancel	
View Logs				
Configuration Set				

2.5 Satellite Setting

Configurate the satellites to be used. "RTK Timeout" setting is for aRTK service (With Hemisphere L-Band service, user cans still keep high accuracy for a period when correction data loses). "Surefix" is hemisphere technology to increase the reliability of the fixed solution. Which means it will be much more difficult to get fixed solution in tough environment.

E300 Pro Web UI	× +					- Ø
· > C 0 0	D Not secure 192.168.	10.1/main.php?action=purge			台	🖪 📭 🌔
E300 Pro E30	P3A1900010					English
Status	*	Cutoff Angle	5	* [0-45]		
Position		GPS	Enable O Disable			
Datalink		GLONASS	Enable Disable			
Information		Beidou	Enable Disable			
Settings	*	GALILEO	Enable B Disable			
Working Mode		SBAS	Enable Disable			
Satellite Settings		RTR Timeout	30	[6-8100]		
Device Configurati	ion	SUREFIX	NORMAL SUREFIX			
NMEA Message		Save	Cancer			
View Logs						
Configuration Set	~					
Paul Data						

2.6 Device Configuration

Configurate receiver settings: User can set time zone. Sensor means MEMS sensor data output. Also, the 5-pin port baud rate is changeable. Speaker "Smart voice broadcast" can be disabled. When SIM card is insert and "WIFI share network" is enabled, PC can surf the internet when connected to device hotspot by using SIM data.

E300 Pro Web UI	×	+			-	٥	×
e → C ☆ @	Not secure	192.168.10.1/main.php?action=purge		\$ 7	-	0	
E300 Pro E30	P3A190001	0			Eng	lish	
II Status	*	Time Zone	GMT+6.00 *				
Position		Direct Link Mode	Disable •				
Datalink		Sensor	Disable *				
Satellites		5-pin Serial Port Baud Rate	115200 •				
Information		Speaker	Enable Disable				
Settings	~	Base Alert	Enable Disable				
Working Mode		Device Debug	Enable Disable				
Satellite Settings Device Configuration	on	Power on automatically when connected 5-pin cable	Enable Disable				
NMEA Message		Network Enable	Enable Disable				
View Logs		WIFI Hotspot Share Network	Enable Disable				
Configuration Set		Static File Naming Way	RINEX 3.02 RINEX 2.11				
Ł Download	~	Sav	Cancel				

2.7 NMEA Message

Configurate NMEA data output through Bluetooth or 5-pin port.

E300 Pro Web UI	×	+	1	6	
	Not secure	192.168.10.1/main.php?action=purge		-	0
E300 Pro E30	P3A19000	10		Englist	
Status	~	Output Genaral			
		GGA: 1HZ · ZDA: 1HZ · GEDOP: Off ·			
Position		GSA: THZ + GSV 5S + GEREF 5S +			
Datalink		GST: 1HZ • VTG: 1HZ • GESNR: 55 •			
		RMC: Off • GLL: Off • GEVCV: 1HZ •			
Satellites					
Information		External Port Output NMEA 🛞 Enable 😳 Disable			
O Settings	*	Save Cancel			
Working Mode					
Satellite Settings					
Device Configurati	on				
NMEA Message					
View Logs					
Configuration Set					
Ł Download	*				
Raw Data					

2.8 View Logs

The log files can be used to diagnose issues. Click "download" to download the files.

E300 Pro Web UI	×	+								1	
· · C O G	Not secure	192.168.10.1/main.php?action=pu	irge						☆	X	
E300 Pro E30	P3A19000	10									
Status	*										
Position		View Logs									
Datalink		1. APP Log	Download	View							
Satellites		2. OS Log	Download	View							
Information											
O Settings	*										
Working Mode											
Satellite Settings											
Device Configurati	on										
NMEA Message											
View Logs											
Computation Set											
2 Download	*										

2.9 Raw Data

Download raw data or convert data to RINEX format. User can use check box, then click "Package" to download multiple files.

€ -> C U (0 Not secure 192.10	58.10.1/main.j	php?action=purge					x 🖪 📭 🕧 :
E300 Pro E30P3A1900010							English -
🖬 Status 👻							
Position	Select	Name	Size (MB)	Antenna Height (m)	Start Time	End Time	Operation
Datalink		selftest.log	0.001				Download Delete
Satellites	Select All	Package	Delete Selected				
© Settings 👻							
Satellite Settings							
Device Configuration							
View Logs							
Configuration Set							
Raw Data							

2.10 Backup Data

The points collected in SurPad4.0 will be backup in receiver storage automatically to avoid data loss. Can restore the data to SurPad software.

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E300 Pro E30P3A1900010 English									
Position	Select	Name	Size (MB)	Operation					
Datalink		20631005.PD.RTK	0.003	Download Delete					
Satellites	Select All Packa	Delete Selected							
Information									
Settings									
Working Mode									
Satellite Settings									
Device Configuration									
NMEA Message									
View Logs									
Configuration Set									
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Raw Data									
Backup Data									
fremonenel 4					*				

2.11 Management

User can update receiver and GNSS firmware as well as register device, format internal disk, restore factory setting, restart device. To update the firmware, click "Chose File" to import the firmware, then click "Upload File" to start updating.

→ C △ ① Not secure 15	2.168.10.1/main.php?action=purge#			x 🖪 💑 🄇
E300 Pro E30P3A1900010				English
E Status Position Datatink Satellities Information D Settings Working Mode	Install New Firmware (Choose File) No file chosen Registration Expire Date: 200 Punction: L1	00013 2,2,099-Gloves-BelCos+Cattoro		
Satellite Settings	AuthCode:		Submit	
Device Configuration				
View Logs Configuration Set	GNSS Registration GNSS Functionality: 564 AuthCode:	0.00002000.00PT=10Hz;RTKL2_L5;MULTI_GNS5;H	EADING,ATLAS_LBAND	
Raw Data				
Backup Data	Security			
❶ Management	Enable Login Authentication Old Password: Online Password: Change Enable WIFI Connect Authentic Change	1860 The imply of the will passeord must be preser than 7		
	Format Internal Disk	к		
	Self Test	к		
	Restore Factory Settings	к		
	Reset	к		

3. Basic Operation

This part shows user some basic operations to start working with E300 Pro.

3.1 Insert SIM card

E300 Pro supports network working mode. Open the cover and insert SIM card.



3.2 Charge the battery

E300 Pro is equipped with Type-C charger which support maximum 45w PD quick charge. Fully charge the battery will take 4 hours typically. The battery indicator is red when charging, will turn green when fully charged.



3.3 Insert radio antenna

The antenna is required in radio working mode.



3.4 Measure antenna height

In order to get correct elevation value, we need to know the correct phase center height of the receiver. However, it is almost not possible to measure the phase center directly. Normally, the software will read the receiver antenna offset parameters. Once user input the measurement height, software will calculate the phase center height automatically. Typically, there are two ways to measure the height:

A: Slant height (to measurement line)

• Centering and leveling the tripod on known point, then measure slant height from the ground point to the arrow at the side of the receiver.

B: Pole height (straight height to device bottom)

• Read the straight pole height



A: Slant height

Measurement Line



3.5 Tilt Survey

E300 Pro is equipped with MEMS sensor which supports tilt survey in SurPad4.0 software. The calibration is very simple.

To calibrate the MEMS sensor, receiver must be in Fixed solution. In SurPad4.0 software, connect device and click "Device" -> "Device Settings", open "Pole Tilt Correction" function. Then, go to "Survey" -> "Point Survey" page. The software will guide user to calibrate the sensor.

- Input the correct pole height
- Draw circle on the ground using the pole
- Shake the pole back and forth for around 5-10 seconds
- Rotate the pole for 90° and repeat the lase step until it shows "Ready"



4. Internal Radio

E300 Pro is equipped with 1-watt internal radio. User can select the transmission power 0.5 watt or 1 watt. There are 8 default channel frequency and the frequency of channel "8" is changeable. With new firmware update, lots of mainly used protocols in survey industrial are supported.

Channel	Frequency/MHz
1	431
2	432
3	433
4	434
5	435
6	436
7	437
8	438, Changeable

4.1 Default channel frequency

4.2 Supported radio protocol

Some of the protocols may require firmware update.

Protocol	
SATEL	0
PCC-GMSK	0
TrimTalk 450S	0
South 9600	0
TrimMask III(19200)	0
South 19200	0
TrimTalk(4800)	0
HZSZ	0

5. Standard Accessories

E300 Pro base and rover are using the same hard carrying case.

Base:

	E300 Pro Base									
NO.	Items	Quantity	Model	Description	Picture					
1	Base Carrying Case	1		Carry case for base station External radio and cable can be put inside						
2	E300 Pro GNSS Receiver	1								
3	Charger	1	KSA-45P-45W D5	Type-C port						
4	Power Cable	1		Type-C to Type-C	Q					
5	Charger Plug	4								
6	Measure Tape	1		3m/10ft-16mm	2					
7	UHF Antenna	1	QT440A	Internal UHF Antenna, 430-450MHz, 4dBi, TNCJ	•					
8	Extension Pole	1		25cm						
9	Screw Connector	1								
10	Тгау	1			•					
11	Warranty Card	1			Anno					

Rover:

	E300 Pro Rover								
NO.	Items	Quantity	Model	Description	Picture				
1	Rover Carrying Case	1		Carry case for rover station Controller and bracket can be put inside					
2	E300 Pro GNSS Receiver	1							
3	Charger	1	KSA-45P-45W D5	Type-C port					
4	Power Cable	1		Type-C to Type-C	D,				
5	Charger Plug	4		_					
6	Measure Tape	1		3m/10ft-16mm					
7	UHF Antenna	1	QT440A	Internal UHF Antenna, 430-450MHz, 4dBi, TNCJ	•				
8	Screw Connector	1		-					
9	Warranty Card	1		-	Anna Anna Anna Anna Anna Anna Anna Anna				

6.	Technica	Specifications
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GNSS Receiver		Internal Radio	
Channel *	700	Frequency Range	410 - 470 MHz
Satellite Tracking	GPS: L1CA/L1P/L1C/L2P/L2C/L5	Channel Spacing	12.5 KHz / 25 KHz
	GLONASS: G1, G2, G3	Emitting Power	0.5 W / 1 W
	BeiDou:B1I, B2I, B3I, B1C, B2a, B2b, ACEBOC	Operating Range	3 - 5 km typically
	Galileo: E1, E5a, E5b, ALTBOC, E6	Communication	
	SBAS: L1/L5	5-pin	Connect to external power and radio
	IRNSS	Туре-С	For charging and data transmission
	QZSS: L1C/A, L1C, L2C, L5, LEX	SIM Card	NANO SIM
	L-Band: ATLAS H10/H30/H50	Cellular *	Global 4G
Update rate	5 Hz, up to 50 Hz	Bluetooth	V2.1+EDR / V4.1 Dual Mode, Class 2
Signal Reacquisition	< 1 sec	WIFI	802.11 ac/n/b/g/n
Hot Start	< 10 sec	WebUI	Update firmware, manage settings and
Initialization Reliability	> 99.9%		status, download data
Memory	16 GB	Voice	Support TTS voice broadcast
Performance (RN	IS) ¹	Electronic Bubble	Support
Static Accuracy	Horizontal: 2.5 mm + 0.5 ppm	MEMS *	Support
	Vertical: 5 mm + 0.5 ppm	NMEA Output	GGA, ZDA, GSA, GSV, GST, VTG, RMC, GLL
RTK Accuracy	Horizontal: 8 mm + 1 ppm	Physical Specific	ations
	Vertical: 15 mm + 1 ppm	Dimensions	φ158 mm x 53 mm
Code Differential	Horizontal: 0.25 m	Weight	940 g
SBAS Accuracy	Horizontal: 0.3 m	Operating Temperature	-30°C ~ +65°C
Power Supply		Storage Temperature	-40°C ~ +80°C
Battery	Rechargeable, built-in Lithium-ion battery	Water/Dust Proof	IP67
	7.2 V - 6800 mAh	Shock	Survive a 2 m pole drop on concrete floor
Voltage	9~28 V DC external power input		1.2 m free drop
Working Time	Up to 12 hours	Vibration	Vibration resistant
Charge Time	Typically 4 hours	Humidity	Up to 100%
		Indicator	Satellites, Datalink, Battery level, Bluetooth
			Smart battery indicator

Illustrations and technical specifications are subject to change without notice. 1. The accuracy claimed is based on the optimal environment.

7. Warranty Policy

The Guarantees Rights

■e-survey supports free exchange or refund within 7 days from the day when you have received the products, where the device appears "performance failure", which confirmed by e-survey repaircenter.

■e-survey supports free maintenance or exchange within 15 days from the day when you have received the products, where the device appears "performance failure", which confirmed by e-survey repair center.

■e-survey supports free maintenance or exchange the same type of device within one year from the day when you have received the products, where the device appears "performance failure", which is still not in working conditions after two repairs.

∎e-survey supports a 24-month warranty service for the device host and a 3-month free warranty service for the accessory from the day when you have received the products.

Warranty service

If the device host meets the warranty conditions, the warranty service can be obtained according to the warranty card and the purchasing invoice. If the proof of purchase and the warranty card cannot be provided, and e-survey will use the delivery time as the standard for the warranty period.

If it is a non-warranty product, and the repair center will handle the maintenance of the extrafee.

After the device is repaired, the same fault is con-firmed by the repair center and e-survey will provide a 3-month free warranty service.

The transportation, delivery and disposal costs incurred during the delivery or inspection of the product to e-survey shall be borne by the user. The freight generated by the repair or inspection equipment returned to the user shall be borne by e-sur-vey.

Equipment that needs to be repaired or sent for inspection, please back up the data in the machine in time.

During the warranty period, the parts normally used for maintenance are free.

The parts that have been replaced during the repair are owned by e-survey.

∎e-survey is not responsible for non-product standard and software or applications that are not certified by the company.

Following conditions are not within the scope of the warranty and service

The device host and accessories have been subjected to: abnormal or improper use, improper storage of abnormal conditions, unauthorized disassembly or alteration, accidents, damage caused by improper installation.

Damage caused by improper use of user, such as liquid injection, damage due to external force, etc.

Failure to use, repair or transport caused by the equipment's instruction manual.

Damage to the product is caused by external, including but not limited to, abnormal and unpredictable factors such as satellite systems, geomagnetism, static electricity, physical pressure, etc.

Damage caused by force majeure such as earth- quakes, floods, wars, etc.

 $\hfill \ensuremath{\,{\rm O}}$ Other conditions that cannot comply with the relevant provisions of the Guarantees Rights.