

# Menu

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# **Chapter I: Overview**

In this chapter, you will learn about GINTEC Team and G40 GNSS Receiver.

### **§1.1 Introduction**

Welcome to use GNSS products of GINTEC team (Guangzhou <u>G</u>eosurv <u>In</u>formation <u>Tec</u>hnology Co.,Ltd). Our team has been committed to popularize the advanced GPS surveying and mapping technology and products to the hands of measurement users. If you want to know more about us, please visit the official website: http://www.gintec.cn/.

This manual is G40 measurement system as an example, for how to install, set up, upgrade, daily maintenance, the use of accessories and how to use RTK system operation to explain. Even if you have used other models of RTK products of our company, it is recommended that you read this instruction carefully before using the instrument for better use.

## §1.2 Highlights of G40

#### New-Generation Soc

Powerful GNSS SoC chip with 1408 channels.

Supports the new B1C, B2a, B2b, and BeiDou-3.

L-band support.

#### New Antenna Combination

Highly integrated GNSS,4G, WIFI, and Bluetooth antennas

Powerful Performance, Smaller Size

#### Calibration-Free Tilt Compensation

Calibration and initialization FREE IMU

Ready for tilt survey straight out of the box

#### Anti-Interference Technology

Advanced multi-frequency interference suppression and multi-step adaptive filtering technology

Strong and stable signal in challenging conditions

G-FIXED Correction Outage Technology

Extend RTK positioning up to 10mins

Reducing downtime waiting to re-establish RTK corrections

#### Augmented Reality (AR)

Overlay digital information onto the real world

Assist to view the stakeout location and seeing planned features in real time

#### Built-in Battery, PD Quick Charge

Support USB PD3.0/45W quick charge

Charging time  $\leq 3.5$  Hours

Battery life  $\geq 1,000$  cycles

#### Professional Camera

High-resolution Night vision camera

Brood perspective, sophisticated algorithms guarantee the precision of up to 1cm

Seamlessly combines 360-degree AR layout and image layout

# **Chapter II: Product Introduction**

By reading this chapter, you can master the composition, installation, and functions of the G40 measurement system in detail.

### §2.1 Introduction

G40 measurement system is mainly composed of host, manual and accessories, as shown in the figure:



## §2.2 Introduction of G40

## §2.2.1 Structure and Interface



Structure and Interface	APPLICATION
UHF antenna interface	Connecting build-in radio antenna
Type-C interface	Charging and data transmission
Connecting screw hole	Used to fix the G40 on the base or pole
Serial number	To identify each device and register code
Sticker	To show some information about G40
Camera	Support AR stakeout
SIM card interface	Insert SIM card to enable device access the internet

# §2.2.2 Buttons and Indicators

G40 has two indicators and one button .:



Buttons and indicators	Function	Condition
	Switch on/off, confirm	Power on, power off, confirm the modification item

	Satellite indicator	Red light flashing indicates that no satellite signal Green light flashing indicates receipt of satellite signal but not fixed A constant green light indicates that device is fixed
IT	Data indicator	A constant blue light indicates that Bluetooth has been connected Blue light flashing indicates the data is transmitting

#### §2.2.3 Function of Button

#### **I** Mode checking

When G40 is working normally, click the power button, then a voice will broadcast the current working mode.

#### **I** Power on

In shutdown state, long press the power button, when G40 tick and all the lights on, release the button and G30 will power on.

#### **II** Power off

In boot on state, long press the power button, when the voice broadcast "power off", click the power button again.

# §2.3 P9IV Controller

## §2.3.1 Appearance



# §2.3.2 Keyboard



No.	Key	Definition				
	Keys with numbers	To enter numbers				
	Keys with functions (Related function	Orange voice icon on key "1"	Voice input to make Surpad perform some voice commands (under development)			
1	refers to orange icons when	Orange camera icon on key "2"	Can call up the Camera button			
	activating)	Orange screenshot icon on key "3"	Take a quick screenshot			
		F1-F5	User can define			
2	Key for measuremet	When Surpad interface isn't displaye Surpad interface.	ed, press to open or switch to			

	2	When Surpad interface is on disp	play, press to collect data.				
3	Keys for direction	Move up, down, left, and right on the screen or menu in function state, the up and down keys are for volume control; in the function state, the left and right keys are for screen brightness control.					
4	Recent Key	Call the list of recent apps					
5	Home Key	Back to Home Page					
6	Return Key	Back to last interface					
7	Enter key	Confirm/line feed In Surpad interface, this key is us state	ed to collect data in the non-inpu				
8	Delete Key	Delete one character before enter other characters.					
9	Tab Key	Make table					
10	Shift Key	When using the physical keyboa switch between numbers, lowerc					
11	Fn Key	Fn mark will prompt in the upper in the upper in the key, meaning the functions marked used.	· · · · · · · · · · · · · · · · · · ·				
			Solid red: power is <15%.				
12	Power LED	In standby mode	Off: power is >15%.				
12	Power LED	In charging Flashing green: in chargi Solid green: full of charge					
13	Power button	Turn on/off device					
14	WiFi/Bluetooth LED	Blue: handheld is connected with Green: handheld is connected wi Off: handheld isn't connected three	th receiver WIFI.				

## §2.3.3 Bluetooth Connection

10:48		™ <sup>20</sup> al № <sup>4</sup> al 84%∎	10:48 🛤	но 👷 "щ но 🕍 84% 💼	10:49 🛤	⊨o \$ệal ⊨o *\$al 83% â
≡ 2023052	No data		← Commu	nication	← Commu	
			Device manufacturer	GINTEC >	Device manufacturer	
Communication	Rover	Base	Device Type	RTK(G40) >	Device Type	
			Communication Mode	Bluetooth >	Communication Mode	
	-	Y	Bluetooth Device List	*	Bluetooth Device List	❀ ⊟
Static	Configurations	Calibrate Sensor	Paired Devices	Search Devices	Paired Devices	Search Devices
	678		G4001515100002		G4001515100002	_
Device Settings	Default Radio Settings	Restart Positioning	G4001515110004		G4C Connection progr	ress
E			Victor 的 Buds2		Vict Get Device Info	
			G4001515100001		G4C	CANCEL
Device Activation	More					
	<b>1 9</b>	2 × 2	Search Fast co	nnection Connect	Debug	Stop
Project	Device Surv			Bolinect	Debug	0.00

Start the G40 first, and then use P9IV controller to perform the following operations:

1. Open SurPad software and click "Communication" to enter the connection interface.

2. Select the manufacturer as "GINTEC", the device as "G40", and the communication mode as "Bluetooth".

3. Select the corresponding SN and click "Connect". The connection succeeds after the progress bar ends.

## **§2.4 Introduction of Accessories**

#### §2.4.1 Instrument Container



#### §2.4.2 Charger

Standard configuration includes charger and charging cable:

While charging, when the power indicator is red, it means charging; when the indicator is green, it means full.

Power adapter and charging cable:



§2.4.3 UHF Radio Antenna



UHF radio antennas are required for the built-in radio Base mode and the built-in radio Rover mode.

# §2.4.4 TYPE - C Cable

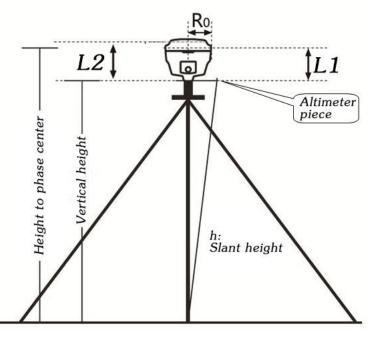
TYPE - C cable is to connect the G40 with computer, used for transmission of static data or receiver firmware upgrading.



# **Chapter III: Mode Setting**

# §3.1 Static Mode

1) Set up a tripod at the control point, connect the tribrach, strictly center and level the measuring point.



- 2) Measure instrument height for three times, and the difference between the three times shall not exceed 3 mm and take the average value.
- 3) Record SN, point name, instrument height and start time.

20211221	SINGLE Age0	<b>℃</b> 45 Ⅲ	← Static	mode setti	ngs
			Options Settings		
			Point name		312
ommunication	Rover	Base	PDOP limit		3.0
	76	9	Cut-off angle		10
Static	Device Information	Inspection Accuracy	Collection Interval		1HZ
			Auto Record Static	: Data	
Tø			Antenna Parameters		
ice Settings D	evice Activation		Antenna Measured	d Height	1.
			Antenna Measurement Type	Height fro	m Phase Center
			Antenna Height		1.
		X	Stop Record	Advanced	Apply

4) Switch on the G40 and connect with controller software, set the receiver to static mode, and set the parameters as the picture shows. (The memory capacity of G40 must be sufficient.

Generally, 8 MB storage capacity is required in an hour.)

- 5) G40 starts to search for satellite and the satellite lights start flashing. When the recording condition is reached, the status light will flash at the set sampling interval, and the flash indicates that an epoch is collected.
- 6) After the surveying finished, shut down G40, and then transport the data and process data.

#### § 3.2 RTK Mode (External Radio)

#### §3.2.1 Base Setup

Base station must be set up in the open field, the surrounding environment should be open, the terrain should be higher. Do not set it up near high-voltage power transmission, transformation equipment, near radio communication equipment antenna, or under trees and near water.

Setting steps:

- 1) Set up the tripod as shown in the figure above, hang up the radio, fix the G40, and connect the extension rod and the large radio transmitting antenna.
- 2) Connect the battery with Radio by Y-type power cable.



(External Radio)

(Battery)

#### §3.2.2 Starting Base

Used TRU35 external radio as an example to show the process, and if has another radio, please consult the technicist.

 Click "External Radio Configuration" under "Tools" in SurPad.

- Commu	Communication 🥝		Communication		No data 0 Age0 0	, ∎ 🗧 🖶
Device manufacturer	geo >	Az.				
Device Type	RTK >	Localization	Coordinates	Angle Converte		
Communication Mode	Bluetooth >		Converter			
Bluetooth Device List	8		X			
G1003619000064	C8:DF:84:66:A0:F8	Perimeter and	COGO	Calculator		
F90029910043	AA:AA:AA:AA:AA	Area	Calculation			
F90023910009	88:3F:4A:CA:28:BF					
F90023910047	F0:B5:D1:70:9C:63					
F90013811011	2C:6B:7D:18:87:2D	External Radio	Volume	Add offsets		
F90023910010	88:3F:4A:CA:18:5D	configuration	Calculation	to points at specified perio		
F90023910035	F0:B5:D1:6F:EF:7B		-			
F90013811001	2C:6B:7D:19:F8:51					
F90023910057	F0:B5:D1:7A:35:33	FTP Shared	Share			
F90029910043	D4:53:83:5F:87:F9	Data				
F90029910025	D4:53:83:60:A5:28			1		
F90029910046	D4:53:83:5B:F7:73					
F90023910001	F0:B5:D1:70:3E:39		_			
Debug	Stop	Π	🖌 🖓 evice Surv	ey Tools		

2) In "External Radio configuration", choose "Radio type" to be "Geoelectron" and

"Connection mode" to be "Bluetooth", then search TRU35 radio and connect it.(Pairing code is "1234").

Radio type	Geoelectron	Parameter setting	>	Param	rter setting		
Connection mode	Bluetooth >	Channel detection	>	Rece frequ	iving channel ency		Custom
earch bluetooth device list				1:	441.000000	2:	442.000000
		Equipment information	>	3:	443.000000	4:	444.000000
		Temperature control	>	5:	445.000000	6:	446.000000
		Radio control	5	7:	447.000000	8:	448.000000
				Transfrequ	smitting channel		Custom
		Firmware update	>	1:	441.000000	2:	442.000000
				3:	443.000000	4:	444.000000
				5:	445.000000	6:	446.000000
				7:	447.000000	8:	448.000000
				Curre	ent channel		7
				Radie	Protocol		TrimTalk 450S
				Tran: rate	smistting baud		9600
					Read co	mpletion	LOW

 After connected, you will come to "Functional selection" interface, click "Parameter settings", click "Get" to receive TRU35 parameters and there to change the "Receiving channel frequency", "Transmitting channel frequency" and other settings, then press "Settings" to finish settings.

4) Turn on the device. Connect the device WIFI by your computer or controller, WIFI name is device SN number. Then login device webui, website is 192.168.10.1

GINTEC	G4001515110	🗛 💷 79% ()	
Info ^	Working mode Data link	Static Rover © Base © Bluetooth Network Radio Dual	Î
Satellites Modules	Auto start base Site ID	<b>1</b>	
Settings ^.	Difference type PDOP threshold	RTCM32 V 3.5	[1 - 99]
Working Mode Satellites	Coordinate	Single      Specified coordinate	
System Para Output	Record raw data		
🗅 File 🗸	Bluetooth name	TRU3032040031	
🛱 Management 🗸	MAC addr	BF:18:18:92:75:BA	

5) Under "Settings", Choose "Working Mode" to be "Base" and Data link choose "Bluetooth"

GINTEC	G4001515110	<b>0004</b>
	Auto start base	
(i) Info	Site ID	111
	Difference type	RTCM32 V
Position	PDOP threshold	3.5 [1 - 99]
Satellites	Coordinate	Single      Specified coordinate
Modules		
Settings ^	Record raw data	
Working Mode		
Satellites	Bluetooth name	TRU3032040031
System Para	MAC addr	BF:18:18:92:75:BA
Output	List	TRU3032040031 V Get bluetooth
🗇 File 🗸	Auto reconnect	
🗅 file 🗸 🗸		
☐ Management ~	Submit	Save and start

6) Choose "Get bluetooth", connect external radio type from the List, and then click Save and start

### §3.2.3 Rover Setup

After successful set up of the base station, now we can start the rover setting.

Install the G40 on the centering lever, install the radio antenna, bracket, clamp the controller.

The steps are as follows:

- 1) Turn on the G40 and controller, open SurPad software and connect Bluetooth.
- 2) Click "Device" "Rover", choose "Data link" as "Internal Radio", and choose the same channel and protocol as Base. Clip "Apply" to start rover.

20211221	No data Age0	** ° ***		← Rover mode	settings
			-	Cut-off angle	5 >
Communication	Rover	Base		Record raw data	0
0				Data link	Internal Radio 🗦
	10	4		Channel	1 >
Static	Device Information	Inspection Accuracy		Frequency	441
7				Protocol	FarLink 🗦
Device Settings	Device Activation			Base Coordinates Change	Alert 🕕
	<u> </u>	×			
	levice Survey			Advanced	Apply

3) When it shows "Fixed", it is correctly setting, now you can start the surveying work.

## § 3.3 RTK Mode (Internal Radio)

#### §3.3.1 Base setup

Base station must be set up in the open field, the surrounding environment should be open, the terrain should be higher. Do not set it up near high-voltage power transmission, transformation equipment, near radio communication equipment antenna, or under trees and near water.

#### §3.3.2 Starting Base

1) Open SurPad in the controller, Click "Device"  $\rightarrow$  "Base" to set Base station.

20200103	SINGLE 35 Age0 42 😇 🔆 🏭	←	Base mod	e settings
		Bas	se ID	11 🛇
unication	Rover Base	Sta	art up mode	Use Current Coordinates
luon	Base	Dif	ff mode	RTCM3 >
	Co / 🕘		se startup	
	Work Mode <sup>2.</sup> Configuration: Status	8 Ref	cord raw data	
		Da	ta link	Internal Radio
	Calibrate Device Setting	Cha	annel	2 >
	Sensor		equency	442
	<b>B</b>	Pro	otocol	TRIMTALK >
	Restart Device Positioning Activation			
	ntce		Advanced	Apply

2) Under "Base Mode Settings", Choose "Data link" to be "Internal Radio", set the channel, frequency and protocol, then apply to finish setting.

#### §3.3.3 Rover Setup

This step is the same as §3.2.3 Rover Set up, please check this section.

## §3.4 RTK Mode (Network mode)

#### §3.4.1 Base Setup

Base station must be set up in the open field, the surrounding environment should be open, the terrain should be higher. Do not set it up near high-voltage power transmission, transformation equipment, near radio communication equipment antenna, or under trees and near water.

Set up the tripod, fix the G40, and connect the radio antenna.

#### §3.4.2 Starting Base

 After setting, please make sure there is a workable Sim card inside G40 base. Then open SurPad in the controller, Click "Device"→ "Base" to set Base station.

0 20200103	SINGLE 35 Age0 42		← Base mo	ode settings	÷	cor	RS server ma	inager
	Age0 42		Base ID	11	No.	Name	IP	Port
		末	Start up mode	Use Current Coordinates		-	-	
Communication	Rover	Base	Diff mode	RTCM3 >			-	-
	Co	/-	Base startup			200	10.00	- C
Static	Work Mode Status	<sup>2.</sup> Configurations	Record raw data			-	-	
		7	Data link	Device Internet >			-	-
Device	Calibrate	Device Settings	APN Settings					-
Information	Sensor	Device settings	Operator	>				
63	7	<b>(#</b> )	Name	CMNET				
Default radio	Restart	Device	User	CARD				
settings	Positioning	Activation	Password	•••• 🐵				
1.			CORS Settings					
			Name	G >				
			Base access point	galaxy				
Π			Advanced	Apply	÷	Add	Edit De	elete OK

- Under "Base Mode Settings", Choose "Data link" to be "Device Internet", then go to set Cors parameter. (When use "Device Internet", please input the correct the APN setting as your mobile network service provider ask for)
- 3) Clip "Add" in the Cors setting page, then import your Cors "IP" and "Port", then choose the Cors information you set, clip "OK".
- 4) Input the name you want in "Bae access point", and you can also input "password", then apply. (Remember what you have input, it will be useful when you set up rover).

node settings	← Base m	nager	RS server ma	со	~		Server Address	÷
Use Current Coordinates	Start up mode	Port	IP	Name	No.	Test		Name
RTCM3	Diff mode		1000	21		192.168.10.1		IP
•	Base startup		-			1234 🕄		Port
0	Record raw data	1.0						
Device Internet	Data link	-	-	10.1				
	APN Settings	100	-		- 9			
	Operator			10				
CMNET	Name	1234	192.168.10.1	Test	8			
CARD	User							
@	Password							
	CORS Settings							
Test	Name							
galaxy	Base access point							
password @	Password							
Apply	Advanced	lete OK	Edit De	dd	, ,		ок	

## §3.4.3 Rover Setup

After successful set up of the base station, now we can start the rover setting. Install the G40 on the centering lever, install the radio antenna, bracket, clamp the controller.

The steps are as follows:

- 1) Turn on the G40 and controller, open SurPad software and connect Bluetooth.
- 2) Clip "Device" "Rover", choose "Data link" as "Phone/Device Internet" (When use "Device

Internet", please input the correct the APN setting as your mobile network service provider ask for).

- 3) Clip "Cors Setting" and choose the same item as what your base used.
- 4) "Get Access Point" and choose the access point as your base setting. Clip "Apply" to start rover.

20211221	No data Age0	<b>**</b> ° ***	<b>~</b>	Rover moc	le settings
			Cu	it-off angle	5 >
Communication	Rover	Base	Re	cord raw data	
	Cover	Dase	Da	ata link	Phone Internet
R	Te	4	Co	nnect mode	NTRIP >
Static	Device Information	Inspection Accuracy	COF	RS Settings	
			Na	ame	Geo >
Device Settings [			Us	er	Wyatt
			Pa	ssword	
			Mos	intPoint Settings	
			Mo	ountPoint	0001_H_RTCM32 >
				Get Acce	ess Point
			Rec	eive data	
			Au	ito connect to networl	k 🔳
	Revice Survey	Tools		Start Adva	inced Apply

4) When it shows "Fixed", it is correctly setting, now you can start the surveying work.

# § 3.5 AR Stakeout

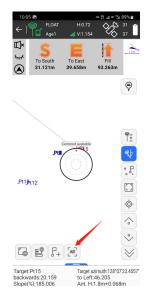
1) Turn on SurPad software, Click "Device"- "Communication", Communication Mode choose "WIFI"

09:29	ଙ୍କ teo "al teo "al 94% ∎
← Commur	nication
Device manufacturer	GINTEC >
Device Type	RTK(G40) >
Communication Mode	WIFI >
WIFI Device	
G4001515100001	E8:4F25:26:AE:27
13500012599	34:FC:A1:ED:86:C3
DIRECT-FD-HP Smart Tank 510	C6:65:16:6D:EA:FD
Z32326861003458	14:00:20:04:02:DA
Search Fast con	nection Connect

2) Click "Device Settings"- "Frequency", choose "5G"



3) Click "Survey" - "Point Stakeout", choose the point what you want to stakeout and click "AR"



# **Chapter IV: WEB UI**

# §4.1 WebUI Login

Start the G40 properly, use a mobile terminal such as a laptop or mobile phone, open wifi,

and find the G40 hotspot. The hotspot name format is the device SN number. After connecting successfully, enter 192.168.10.1 in the browser and go to the WebUI background page.

- WLAN			
₢40015151	10004		
GINTEC	G4001515110	004	<b>ඩු ම</b> 79% ()
(i) Info ^ Position	Working mode Data link	Static Rover O Base Bioefcooth Network Radio Dual	
Satellites	Auto start base Site ID	m	
Settings ^     Working Mode	Difference type PDOP threshold	RTCM32 v 3.5	[1 - 99]
Satellites System Para	Coordinate	Single Specified coordinate	
Output	Record raw data	TRUS022940051	
🛱 Management 🗸 🗸	MAC addr	BF-18:16:92:75:BA TRU50022040031 V Get bluetooth	

# §4.2 Common Function from WEB UI

## §4.2.1 Code Registering

GINTEC	G4001515100002		ty =
	System upgrade		
0 ×	Device registration		
ttings ~	Expiration time	20230901	
	Function	2512	
anagement ^	Registration code		Register
ge	GNSS registration		
	System security		
	System operations		

Click "Management-Manage", you can paster the register code here to active the G40.

### §4.2.2 Time Zone Setting

	568.10.1/index.html#/setting-device		~ O & & &
GINTEC	G4001515110004		🔮 <b>000</b> 735
	Time zone	GMT+8:00 ~	
nta ~	Sensor	SHz ····	
ettings ~	Voice		
king Mode	Base station alarm		
lites	Debug mode		
ern Paca	Static file naming way	R0NEX2.11 V	
put	Transfer base station site info		
le ~	Transport service	Cloud service     Trace back	
lanagement ~	Tracker		
	Superint		
a pe	and an		

Click "Settings-System Para", where you can modify time zone. You can also modify other parameters here.

#### §4.2.3 Data Download

#### Methods I: WebUI

Click "File-Raw Data", choose the right data format and date to get the data list. Download the data you want in the coming list.

GINTEC	G	4001515100	002				
	R	ew.					
info ~	н	ome					
Settings ~		File	Size(Mb) 0	Antenna height (m)	Start 0	End 0	Operations
Te ~		seiftest.log	0		2023-06-09		Download Delete
w Data		00021571.dat	2.578	0.200	2023-06-06 17:32: 08	2023-06-06 17:41: 42	Download Delete Opeoplicats
		00021572.dat	0.065	0.200	2023-06-06 17:42: 10	2023-06-06 17:42: 30	Download Delide Openations
Management ~		00021573.dat	SERO	0.200		2023-06-06 17:46: 30	Downikipas Delete
		00021581.dat	1.334	0.200	2023-06-07 14:44: 26	2023-06-07 14:47: 59	Downsoad Dente Openations
		00031581.dat	0.655	1.800	2023-06-07 14:57: 42	2023-06-07 1458 31	Download Delete
		00031582.dat	0.143	1.625	2023-06-07 14:58: 42	2023-06-07 14:59: 05	Download Delete
		00031583.dat	0.08	1.625	2023-06-07 14:59: 30	2023-06-07 14:59: 43	Download Delete Operations
		00131581.dat	4.32	1.648	2023-06-07 15:00: 18	2023-06-07 15:09: 34	Download Delete Operations
		00131582.dat	0.436	1.625	2023-06-07 15:09: 49	2023-06-07 15:10: 36	Download Delete Operations
		scheck.log	0		2018-01-05		Download Delete

#### Methods II: USB cable

Connect G40 with your PC by USB to Type-C cable, your computer will automatically read a G40 storage folder. Open it and choose the "record" to the folder you want and download the

file you need.

늘 record				
④ 新建 ~ 🔥		↑↓排序 ~ = 章者 ~		
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> 📁 图片	00021571	2023/6/6 17:41	DAT 文件	2,641 KB
> 📁 文档	00021572	2023/6/6 17:42	DAT 文件	67 KB
✓ ■ 此电脑	00021573	2023/6/6 17:46	DAT 文件	853 KB
> 2 视频	00021581	2023/6/7 14:47	DAT 文件	1,367 KB
CONTRACTOR OF A	00031581	2023/6/7 14:58	DAT 文件	683 KB
> 🔀 圏片	00031582	2023/6/7 14:59	DAT 文件	147 KB
> 🔤 文档	00031583	2023/6/7 14:59	DAT 文件	83 KB
> 🛓 下载	00131581	2023/6/7 15:09	DAT 文件	4,424 KB
> 🕑 音乐	00131582	2023/6/7 15:10	DAT 文件	447 KB
> 🛄 桌面	📄 scheck	2018/1/5 20:50	文本文档	1 KB
> 🏪 Windows (C:)	i selftest	2023/6/9 18:01	文本文档	1 KB

## §4.2.4 Device Firmware Update

Ask the newest firmware from the technicist where you buy G40 from, follow the next steps to update the firmware.

#### WebUI

Click "Management-Manage", better to use "Choose file" function. Choose the firmware file you got and upload. G40 will automatically restart after the firmware is installed successfully.

#### **Appendix A: G40 Technical Specifications**

Configuration		Detailed Indicators
Measurement Performance	Signal Tracking	1408 Channels GPS: L1C/A, L2P(Y), L2C,L5 GLONASS: L1,L2 BDS: B1L,B2L,B3L,B1C,B2a,B2b* GALILEO: E1,E5a,E5b,E6* QZSS: L1,L2C,L5,L6*
	GNSS Features	Positioning output rate: 1Hz ~ 20Hz Initialization time: < 5s Initialization reliability: > 99.99%

# GINTEC

Positioning precision	Static GNSS Surveying Real-Time Kinematic	Horizontal: ± (2.5mm+0.5ppm) Vertical: ± (5mm+0.5ppm) Horizontal: ± (8mm+1ppm) Vertical: ± (15mm+1ppm)
	Surveying	-
Inertial sensing system	IMU	Support
	Tilt Angle Tilt compensation accuracy	0° ~ 60° 10 mm + 0.7 mm/°tilt(1.8m pole)
	Operating system	Linux
	Buttons	One button operation
	Indicators	Two indicate lights
User interaction	Web UI	Support to access Web UI via Wi-Fi and USB
	Voice guide	Support for multiple languages: Chinese, English
	Dimension	152mm*152mm*92mm
	Weight	900g
	Material	Magnesium aluminum alloy shell
Hardware Performance	Temperature	Operating: -25 °C~+65 °C Storage: -35 °C~+80 °C
	Humidity	100% Non-condensing
	Protection	IP68
	Shock	Withstand 2 meters pole drop
Power and	Power Supply	6-28V DC, overvoltage protection
Battery	Battery	Internal Li-on, 6900mAh, 7.2V
Communicati	I/O port	Type-C port (Charging and data transmission) 1 radio antenna interface Micro SIM card slot
	Wireless modem	Built-in radio, 1W, typically work range: 6KM Frequency Range: 410-470MHz Communication Protocol: SOUTH, TrimTalk, Hi-target, TrimMark III, Satel, Geotalk
	4G	LTE FDD: B1/B3/B5/B7/B8/B20 LTE TDD: B38/B40/B41 WCDMA: B1/B5/B8 GSM: 850/900/1800/1900MHz
	Bluetooth	V5.0, BLE

	WiFi	802.11 b/g standard
	WIFI data link	To work as the datalink that receiver can broadcast
		and receive differential data via WIFI
Data storage/ Transmission	Data Storage	4GB internal storage,
		Changeable record interval, up to 20Hz raw data
		collection
	Data Transmission	USB data transmission, supporting FTP/HTTP data
		download
	Data Format	Differential data format: CMR, sCMRx, RTCM
		2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2
		GPS output data format: NMEA 0183, PJK plane
		coordinates, Binary code
		Network model support: VRS, FKP, MAC, fully
		support NTRIP protocol