Workflow guide

Trimble R12 GNSS Receiver: Configuring the Receiver as an Internet Base for DJI Phantom 4 RTK

July 2020



www.trimble.com

© 2020. Trimble Inc. All rights reserved. Trimble and the Globe & Triangle logo are trademarks of Trimble Inc., registered in the United States and in other countries. All other trademarks are the property of their respective owners.



Contents

Configuring the R12 Receiver	3
Accessing the R12 Web User Interface (WebUI)	3
Setting the position of the base station	4
Setting the Antenna Configuration	4
Setting NTRIP correction stream	5
Connecting the receiver to the Internet	6
Determining the IP address of the receiver	7
Optional: Setting up a DDNS Client to use a static IP address	8
Optional: Creating a new NTRIP-only user login	9
Optional: Testing your NTRIP correction stream	
Configuring the DJI Phantom 4 RTK	12
Notes	14

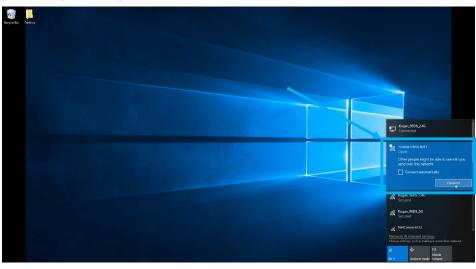


2

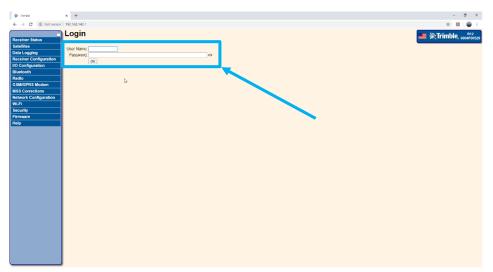
Configuring the R12 Receiver

Accessing the R12 Web User Interface (WebUI)

 Turn on the receiver and connect to its Wi-Fi access point. The receiver Wi-Fi access point is named **Trimble GNSS xxxx**, xxxx being the last 4 digits of the receiver serial number. You won't require a password to connect.



- Once you are connected to the Wi-Fi network, open a web browser and go to 192.168.142.1
- The Trimble GNSS WebUI splash screen displays; enter your User Name and Password. If you don't know the login for your receiver contact your local Trimble Distribution Partner.
- 4. Click **OK.**





Setting the position of the base station

- Open Receiver Configuration > Reference Station from the left side menu.
- 2. Click **Here** to update the reference position to the current location.
- If you are setting the receiver over a known position, input the **Reference Latitude**, **Reference Longitude**, and **Reference Height**. Because you've already clicked Here you should only need to edit the decimal places.

Trimble - 2020-05-22T00:10:41Z	z x +	- o ×
← → C	e 192.168.142.1	x 🖪 😜 i
Receiver Status		EXAMPLE (12)
Satellites	CMR ID: 0	
Data Logging Receiver Configuration	RTCM 2x ID: 0	
Summary	RTCM 3 x 10 to	
Reference Station	Station Code	
Correction Controls Position	© Cartesian ® Geographical	
General	Reference Latitude: 37 1° 50 145.42457 1° ○ N. * S	
Application Files Reset	Reference Longitude: 145 * 5 30 95227 * 8 E 0 W	
Default Language	Reference Height: 76.761 [m]	
I/O Configuration	Here Load Current Position	
Bluetooth Radio		
GSM/GPRS Modern	Position Averaging	
MSS Corrections	Current Position:	
Network Configuration	Lat 37' 50' 45 38999' S Lon 145' 5' 30 94315' E	
Wi-Fi	Higt 77.162 (m)	
Security	Average Position:	
Firmware	Time 1h 1m 19s Lat 37° 50′ 4535706° S	
Help	Lon 145' 5'30 39361' E	
	Hgt 77.041 [m]	
	Reset Average	
	Auto Average:	
	OK Cancel	
	J	

4. Click OK.

Setting the Antenna Configuration

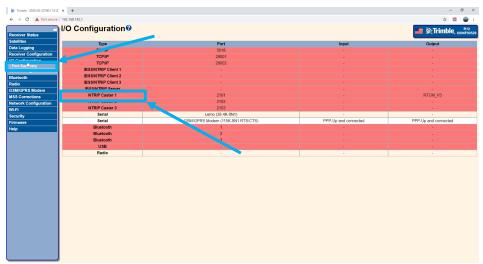
- 1. Open Receiver Configuration > Antenna.
- Define the Antenna Measurement Method you have used.
- 3. Define the **Antenna Height** you have measured.
- 4. Enable Apply Antenna Corrections to: RTCM V3.
- 5. Click OK.

🌾 Trimble - 2020-06-17723-50162	x +	- o ×
← → C A Not secure	192.168.142.1	야 ☆ 🔯 🥽 :
Receiver Status Satellites Data Logging Receiver Configuration	Antenna Configuration	**************************************
	Parties in a deministration (void obus)	
Anterna Tracking Correction Controls Correction Cenneal Application Files Reset Default Language Default Language Default Language Bluetooth Radio GSM/GPRS Modem MSS Corrections	Andorras Mesoverentino Method () forem of enteres recyce * Andorras Height [n] [1978]	
network oomigaration	OK Cancel	
Wi-Fi		
Security Firmware		
Help		



Setting NTRIP correction stream

- Open I/O Configuration > Port Summary from the left side menu.
- Select NTRIP Caster 1 from the list; the Port Configuration screen displays.



- 3. Select Enable.
- 4. Leave the **Port** as the default 2101.
- 5. Optionally, enter an **Identifier.**
- 6. Optionally, enter the **Country.**
- Enter the Mount Point. This is required and should be something that easily identifies the receiver and correction, for example, RTCM_31.
- 8. In the **RTCM** section select **Enable** from the dropdown.
- 9. In the **RTCM** section select **Version: 3.x** from the dropdown.
- 10. Click OK.

Inimble - 2020-06-17123-57-102	× +		- 0 ×
← → C 🔺 Not secure	192.162.142.1		🖈 🔝 🗑 E
Receiver Status Satellites			Trimble, 6004F00529
Data Loging Receiver Configuration IVD Configuration Part Configuration Part Configuration Readio Biotecoch Readio CallwCirrRE Modern MESS Corrections Metawork Configuration Wi-Fi Reswork Configuration Wi-Fi Reswork Configuration Nu-Fi Reswork Configuration Readio Security Firmware Reip	NTipCoster Sector 2012 Sector 201 Sector		
	RTCM (Bendwich line: (Bendwich line: OmniSTAR: Dala for finite, Guider • GK [Guide]		



Connecting the receiver to the Internet

- 1. Insert a SIM card into the receiver. The SIM card must support a public IP address. See <u>Notes.</u>
- 2. Open GSM/GPRS Modem > Configuration.

Summary Summary Section 2 Modern Rover State: On Modern Net: 0100000000000000000000000000000000000	Trimble - 2020-05-22100.12.00 ← → C ▲ Not security		- 0 * 🖪 🖷
Nate Loging Modem RVer Static On Modem RVer 1010000000000000000000000000000000000	Receiver Status		E (2);Trimble, 6004F
	Neemen suuus Dati Looging Receivar Configuration US Configuration Bioletooth Bioletooth Castiguration Castiguration Castiguration Castiguration Status Castiguration Status Castiguration Castiguration Status Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Castiguration Casti	Modern MRE: 0150000000430 Kando Band: 005500000430 Kando Band: 055000000430 Kando Band: 0550000000000000000000000000000000000	

3. Select Change GPRS Service.

Inmble - 2020-05-22100-12:042	(x +	-	σ×
← → C ▲ Not secure	192.163.142.1	\$	🖽 i 🧓 🗄
Receiver Status	Configuration®	💴 🛞 Trimbl	R12 6004F00529
Satellites Data Logging	PPP: Up and connected		
Receiver Configuration	Change GFRS Service: N		
Bluetooth	CD: T		
Radio	GPRS Usor Name:		
GSM/GPRS Modem	or Ro Fabilition		
Summary Configuration	Verify GPRS Password Auto Restart		
MSS Corrections	Autor reesant Se Selatur Toute:		
Network Configuration WI-FI	Connect Disconnect Sava Cancel		
WI-FI Security	Reset Modern		
Firmware	Hosel Nutsen		
Help			
	-		

- 4. Select Country: Australia
- 5. Select **Provider:** Telstra
- 6. Select Plan: Next G
- 7. Define Access Point Name: telstra.extranet
- 8. Define **CID:** 1
- 9. Leave GPRS User Name:
- 10. Leave GPRS Password:
- 11. Enable Auto Restart
- 12. Enable Use as default route
- 13. Click Save.

Note: The configuration here differs for each country. This example is prepared for the Telstra network in Australia.

Trimble - 2020-05-22100.12.282 × +		- 0
← → C ▲ Not secure 192.168.142.1		야 숲 🔟 🧓
Configurati	on@	Jan Strimble, 6004F00
Satellites PPP: Up and connecte	a	
Data Logging		
Receiver Configuration Country:	Australia Provider: Telstra Plan: Next G	
I/O Configuration Access Point Name:	teistra.extranet	
Bluetooth CID:	1	
adio GPRS User Name:		
SM/GPRS Modem GPRS Password	Ø	
Summary Configuration	() ()	
Auto Restart	×	
Use as delauit foute.		
etwork Configuration /i-Fi	we Cancel	
ecurity Reset Modem		
elp		
rielp		

Determining the IP address of the receiver

- 1. Open Network Configuration > Summary.
- 2. The **PPP Remote Address** is the IP address you need to use to connect to for NTRIP corrections.

Note: On the Telstra network, if you have an IP address that is in the 10.xx.xx.x range it indicates that you're still on the Telstra private network. You must restart the receiver to trigger connection with a WAN IP address.

The PPP Remote Address is dynamic and will change with each connection to the network.

Trimble - 2020-05-22700 12:53	37 x +		-	σ×
← → C ▲ Not secur	re 192.168.142.1		아 ☆ 🗄	1 😜 E
Receiver Status Data Logging Receiver Configuration UO Configuration Bluetooth Radio GSM/CPRS Modem MSS Corrections	Network Configuration DNS Address Secondary DNS Address 104 148 70 Secondary DNS Address 104 130 164 (117) Severe how the second address NAT Second 30(5344 mills Middlem) Up and connected 120 157 33.9 120 157 33.9	— %	Trimble	R12 6004F00529
Provide a second	D			



- Open Network Configuration > PPP to check the settings are correct.
- 4. **Port:** Serial 3 (GSM/GPRS Modem)
- 5. Enable Auto Restart
- 6. Enable Use as default route
- 7. Access Point Name: telstra.extranet
- 8. **CID**: 1
- 9. User Name:
- 10. Password:
- 11. Click Save

eceiver Status	PPP Configura	ation		💻 🔅 Trimble, 👦
atellites	Port:	Serial 3 (GSM/GPRS Modam) •		
lata Logging		Up and connected		
eceiver Configuration	Auto Restart:	Ø		
D Configuration	Use as default route:	*		
uetooth				
idio	Use Trimble APN Database:			
SM/GPRS Modem		TELSTRA.EXTRANET	I	
SS Corrections stwork Configuration				
stwork Configuration Summary	User Name:			
PP	Password:	0		
-Mail Clier	Verify Password:	0		
-Mail Aleri	Show advanced settings:	8		
Proxy	Save Connect Disconnect G	a Back To Defaulte Concel		
FTP NTP				
DDNS Client				
Zeroconf/UPnP				
/i-Fi				
ecurity				
irmware elp				
cip				
	1 ·			

Optional: Setting up a DDNS Client to use a static IP address

A DDNS Client is a service that allows you to forward a dynamic IP address through a DDNS server so that you have a static IP address for you to access. This is beneficial if you're using NTRIP over WAN often; it means you won't need to keep checking the PPP Remote Address in the WebUI, or update the configuration on the drone. Many Trimble receivers have DDNS providers embedded as part of the firmware. You'll see the list of options under the Server ID.

- 1. Open Network Configuration > DDNS Client.
- 2. Select Enable.
- 3. Select the Server ID.
- 4. Fill out the required fields for your selected **Server ID.**
- 5. Click **OK**

← → C ▲ Not secure	192.168.142.1					er 🔆 🚮
9	DDNS Config	uration 0				
eceiver Status		Juration				📰 🛞 Trimble, 🚥
itellites						
ta Logging	Last Update Time: N					
ceiver Configuration		bod				
Configuration						
Jetooth		o-ip.com 👻				
dio		mbledemo.ddns.net				
M/GPRS Modem	User Name:	@trimble.com				
SS Corrections	Password:		0			
twork Configuration	Verify Password:		0			
iummary	Forced Update Period: 2					
	r orces opdate Period. [2	, pays				
Routing Table	OK Cancel					
P Filtering -Mail Client						
E-Mail Alerts						
TP						
Proxy FTP DDNS Client						
FTP DDNS Client						
FTP DDNS Client						
FTP DDNS Client fi-Fi ecurity						
TP DDNS Client I-Fi ecurity rmware						
I-FI i-Fi ecurity rmware ogrammatic Interface						
TP DDS Client L-Fi scurity mware ogrammatic Interface VFD/FLUI						
TP IDNS Client						
TP IDNS Client						
DDNS Client JODNS Client I-Fi scurity rmware ogrammatic Interface //FD/FLUI elp						
DDNS Client DDNS Client I-Fi I-Curity rmware ogrammatic Interface N/FD/FLUI Ip						
DDNS Client JODNS Client I-Fi scurity rmware ogrammatic Interface //FD/FLUI elp						
DDNS Client JODNS Client I-Fi scurity rmware ogrammatic Interface //FD/FLUI elp						
PTP DON'S Glient						
FTP						
FTP DDNS Client A-Fi ecurity immware rogrammatic Interface I/VFD/FLUI elp						
PTP DON'S Glient						

Optional: Creating a new NTRIP-only user login

To make it easier to access the NTRIP correction stream in the field you may want to create a login to the receiver that only allows NTRIP corrections, and is a lot easier to type in and configure on the drone.

- 1. Open Security > configuration.
- 2. Define a User Name.
- 3. Define a **Password.**
- 4. Enable NtripCaster.
- 5. Select Add User.

Trimble - 2020-05-22700.14:12	7 × +	- 0 ×
← → C ▲ Not secur		아 ☆ 🔝 🌍 🗄
Receiver Status Satellites	Security Configuration®	Entrimble, 6004F00529
Data Logging Receiver Configuration VO Configuration	Logn P Adtress Range (non-edmin) (aug P) (K)	
Bluetooth Radio	Delete? User Name Receiver Config File Download File Delete Edit User NTripCaster admin 2 2 2	
GMUORE Modem Mis Concections Network Configuration WirFi Becarity Becarity Becarity Compared Participation Compared Participation Compare	Add User Add	



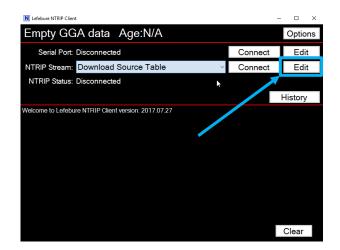
 You can now see your new login listed in the Security> Summary page.

🖗 Trimble - 2020-05-22700.14.3	x x +	- 0 >
← → C 🔺 Not secur	I 192.168.142.1	er 😒 🔝 🥃
Receiver Status	Security Summary@	E : Trimble, 6004F0053
Satellites Data Logging Receiver Configuration VO Configuration Bluetooth	Security Enabled Current User admin Login IP Address Range (ron-damk ny IP Lag Out	
Radio GSM/GPRS Modem	User Name Receiver Config File Download File Delete Edit User NTripCaster	
MSS Corrections Network Configuration Wi-Fi	Intro III	
Summary		
Change Password Firmware Help		
	J	

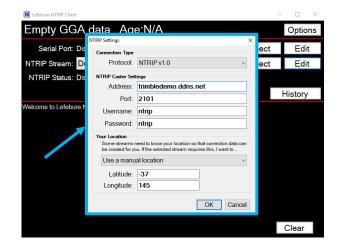
Optional: Testing your NTRIP correction stream

Before heading out in the field you might want to test your new NTRIP correction stream. There are some pieces of software that allow you to do this quite quickly. Lefebure NTRIP Client in one option, it can be downloaded <u>here</u>

- 1. Open NTRIPClient.
- 2. In the NTRIP Stream row click Edit.

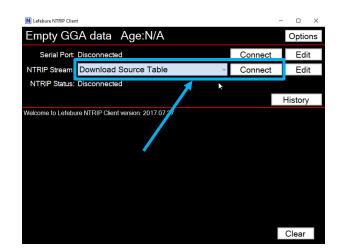


- 3. Address: This will either be your PPP Remote Address, or your DDNS domain.
- 4. **Port:** 2101
- 5. Username: your defined username
- 6. Password: your defined password
- 7. Change the Your location setting to Use a Manual Location
- 8. Latitude / Longitude:
- 9. Click **OK.**





- 10. Select **Download Source Table** from the **NTRIP Stream** dropdown if it isn't already selected.
- 11. Click Connect.



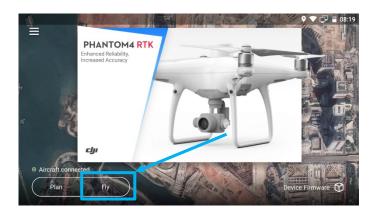
N Lefebure NTRIP Client	-	- 🗆 X
Empty GGA data Age:N/A		Options
Serial Port: Disconnected	Connect	Edit
NTRIP Stream RTCM_31	Disconnect	
NTRIP Status: Connected, 966 bytes ceived.		
		History
Welcome to Lefebure NTRIP Client version: 2017.07.27 10.15.24 AM - NTRIP Sottings Saved 10.15.24 AM - NTRIP Client is attempting to connect. 10.15.28 AM - NTRIP Client is attempting to connect. 10.15.37 AM - NTRIP Client is attempting to connect. 10.15.38 AM - NTRIP Client is connected, Wating for Data. 10.15.39 AM - NTRIP Client is receiving data.		
		Clear

- 12. You should now have the Mount Point **RTCM_31** in the **NTRIP Stream** dropdown.
- Select RTCM_31 from the dropdown and click Connect. You should connect to the NTRIP stream and start receiving a correction stream.

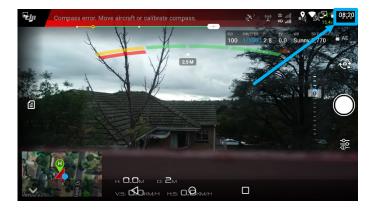


Configuring the DJI Phantom 4 RTK

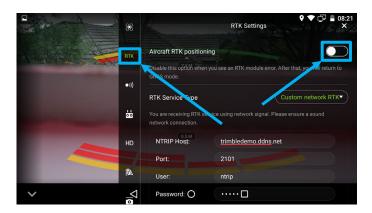
- 1. Make sure your DJI controller can access the Internet. This can either be through a SIM card in the controller, or through a Wi-Fi hotspot.
- 2. Open the DJI GS RTK app.
- 3. Click Fly.



4. Click the Settings menu ••• from the top ribbon.



- 5. Select RTK menu.
- 6. Switch on the Aircraft RTK positioning.





- 1. **NTRIP Host:** This is either the PPP Remote Address, or your DDNS domain.
- 2. Port: 2101
- 3. User: ntrip
- 4. Password: ntrip
- 5. Mountpoint: RTCM_31
- 6. Click Connect.



7. The **Custom Network RTK Status** should show **Connection Success**.



You're now ready to fly with the RTK corrections from your Trimble R12 GNSS receiver—Happy Flying!



Notes

Although this document refers to the Trimble R12 GNSS receiver throughout, the workflow described is also suitable for the Trimble R10-2 and R10 GNSS receivers.

In researching cellular network provider requirements for this document, the links below were used. These are specific to the Telstra network in Australia, but they may be of some benefit as a starting point for discussing the same requirements in other regions.

https://support.netcommwireless.com/sites/default/files/Telstra-SIM-Card-Data-Codes-v1.0.pdf

https://support.netcommwireless.com/sites/default/files/Accessing-a-device-behind-a-router-on-Telstra-Mobile-Broadband-v1.0.pdf

If you require more information about configuring your Trimble R12 GNSS receiver for this workflow in your region, contact your local Trimble Distribution Partner.

