

LandStar8 FAQ Series

APIS: Connecting Base -> Rover with a cellular connection

More FAQ's like this one are available here: [LandStar8_FAQ]

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Thesis

All CHC equipment with internal LTE Modems has a built-in feature called APIS.

APIS allows a single Base and one or more Rovers to connect through the internet cloud without the need for a Static Public IP address. It is very easy to configure and is free.

In addition to supporting CHC rovers and LandStar8, APIS supports foreign device and field software connections by allowing standard NTRIP connections to the Base through the cloud relay.

This FAQ lists the step-by-step process for configuring a Base and Rover using LandStar 8 field software.

Prerequisites

iGage strongly recommends simbase.com for connectivity. See [<u>SIM Cards</u>] for detailed information and links.

The **Base** must have an internal SIM card installed. The Base does not need a fixed static IP address, thus a standard SIM card with CGNAT (Carrier Grade NAT) is fine.

Either the Rover or the Data Collector needs to have internet access. This could be provided by:

activated SIM card in the Rover

activated SIM card in the Data Collector

Data Collector is a phone with cellular activation

Wi-Fi Hotspot connected to the Data Collector (not feasible with Visual Receivers)

Configure the Base receiver

On the Config (tab) config , click the Instruments profile button, click the New button to make a new profile:

SNSS base	Total station	
NSS hase		
	SNSS hase	

Click on GNSS base.



Define the connection method to the instrument:

÷	apis-Instruments profile	nents profile		
Name	iBASE APIS ReadGPS	0		
Brand	CHC	~		
Туре	RTK			
Model	IBASE	~		
Connection type	Bluetooth	~		
Antenna type	CHCIBASE	>		
l Target		Search		
8 GNSS-3738992		0		
③ GNSS-3704057		0		
③ GNSS-3735010		0		
③ GNSS-3786281		0		
⑧ GNSS-3786220		0		
Back	Ne	xt		

Enter a descriptive Name , select the Brand, set Type to RTK, choose the correct receiver for the Model, double check the Antenna type. Connection type = Bluetooth may simplify the process. Click Next.

The connection selection dialog is shown:

•	- apis-Instruments profile	
î.	Internal radio Receiver internal radio selected.	0
<u>in</u>	External radio External radio selected.	0
	Receiver cell network Receiver internal GSM network selected.	0
۲	Receiver cell network + external radio Receiver internal GSM network and radio fallback selected.	0
a*	UAV base Transfer differential data to UAV controller via Wi-Fi.	0

select Receiver cell network. Click Next.



Configure the Base settings:

÷	apis-Receiver cell network	
Data link params		
Differential format		
CHC516		~
		APN Select a server
Domain/IP		
APIS1.huace.cn		
Port		
9901		
Elevation mask		
5		
Start at known position		
GNSS static recording		
Start logging		
Automatically log when the r	receiver is turned on	
HCN		
Open		
RINEX		
Close		
Interval		
5 S		~
Session duration (mins)		
1440		
Station name		
3738992		
Antenna height		
5.906 USft		
Antenna height measureme	ent method	
Vertical H		V
Back	Save	Save & Accent

3

Differential format: If all Rover receivers support CHC516 format, choose CHC516 as it is compressed and will reduce data transfer. CHC516 capable receivers include i93, i89, i73, i73+, iBASE, and i83. If a non-compatible Rover will be used, select RTCM3.2:

UTO	
FCM2.3	
HC516	
FCM3.x	
FCM3.2	
MR	
MR+	
CMRx	
ΓD	

If the **Domain/IP** is not **APIS1.huace.cn**, you can click Select a server and pick it from the list. The Port can be any integer from 9901 through 9909, however there is no reason to change it from 9901.



Click the	AFIN	APN	button:

÷	apis-APN	
Access point		
simbase		
Dial number		
*99#		
Username		
Password		
Cycle power on cell mode	em(Will take about 40 seconds, USA requires it .)	

the Access point must exactly match the APN required for your SIM card. For simbase cards, the APN is simbase as shown above.

The **Dial number** is typically ***99#**. For most SIM cards issued in the USA, the **Username** and **Password** will be blank.

Very Important: If you change the **APN**, the cell modem must be power cycled to reset your local cell tower. Enabling the **Cycle power on cell modem** option will automatically perform the modem reboot, it also will fix most other cell connectivity issues: it is worth the 40-second wait.

Click Set to push the APN to the modem and return to the previous dialog.

For the rest of the settings on the **Base settings** form, configure as you would a UHF base.

Clicking Save & Accept will save and immediately begin the Base setup:

Setti	ng up instrument
	Cancel
Accept successful.	

If the APIS connection is successful you may hear LandStar voice "NTRIP login successful".

After a few moments, the correction LED's (usually Up and Down LED's) should start flashing once per second.

Debugging the Base connection

It is easy to verify that the Base connection is active.

After the Base Instrument Profile is complete, LandStar 8 disconnects from the Base receiver to reduce the chance that you measure points while inadvertently connected to the Base.

Gage

To get C	on the Config (tab)	🗘 Config	. click the	Connect to instruments	button:
	← OPUS_Adju	ıst1-Connect to i	nstruments		
	GNSS	Total station	Pe	eripheral	
	Brand	CHC		~	
	Туре	RTK		~	
	Model	IBASE		~	
	Connection type	Bluetooth		~	
	Antenna type	CHCIBASE		>	
	Target			C Search	
	🛞 GNSS-3738992			Ø	
	(8) GNSS-3704057			0	
	(8) GNSS-3735010			0	
	GNSS-3786281			0	
	GNSS-3786220			0	

Select the Base, then click Connect.

B 100%	DA network	୍ଷର 30/37		H: 0.000 V: 0.000
GN	SS base mode, de	o not use for s	urve	
2	5	2		Þ
GNSS rover	GNSS	base	One-C	lick fixed
			3	0
GNSS static recording	Upg	rade	Adv	anced
P	Í	*	8	0
Instruments profile	Connect to	instruments	Instrur	nent info
+				



Click the black top bar (shown by arrow above), then select the Instrument info tab:

← OPUS_Adjust1-Instrument info :					
Instrument info	Quality	Sky plot	Satellites	GNSS base	
Instrument type: I	BASE		A	0% B 💷 100%	
Expiration date: P	ermanent			P+	
PN: A1051098090	03070005				
SN: 3738992					
Receiver firmware:	2.3.7.1SLABch	enjunT		ĵ	
Board firmware: 1	1492			•	
GNSS rover\base:	GNSS Auto bas	9			
Data link: APIS				Ľ	
Differential format:	CHC516				
IP: APIS1.huace.c	'n				
Port: 9901					
APN: simbase					
Dial number: *99#	ŧ				
APN username:					
APN password:					
Data link: PDA net	work APIS			Ľ	
IP: apis1.huace.cr	ı				
Port: 2201					
GNSS base SN:					
Auto logging: Yes					
Session duration (r	nins): 1Day 0H	our			
	A	PIS login successf	ul.		
		Refresh			

The APIS login status will be shown at the bottom of the screen.

Configure the Rover receiver

On the C	Config (tab)	Ç Config	, click the	e Instruments p	orofile	Instruments profile	button, click	the
	New •	button	to make	a new profile:				
		Instruments						
	GNSS rover							
	GNSS base							
	Total station							
		Cancel						
Click on	GNSS rover							



Define the connection parameters:

÷	apis-Instrun	nents profile	
Name	i93 API	S Rover	٥
Brand	CHC		\sim
Туре	RTK		~
Model	i93		
Connection type	Wi-Fi		V
Antenna type	CHCI93	NONE	>
l Target			
GNSS-3704057			>
Back		Next	

If the Rover is a visual receiver, you will need to select **Connection type = Wi-Fi**. After configuring, click on **Next**.

The connection type dialog will be shown:

ŕ	← apis-Instruments profile	
-81	NTRIP NTRIP service is selected.	0
0	APIS APIS selected.	0
Ĉ.	Radio Internal radio selected.	0
0	TCP TCP service is selected.	0
×	PPP Satellite-delivered service selected.	0

Select **APIS**, then click on **Next**.

The **Data link parameter** dialog will be shown:

÷	apis-APIS
Data link params	
Network	
Receiver network	× .
	APN Select a server
Domain/IP	
APIS1.huace.cn	
Port	
9901	
GNSS base SN	
3738992	0
Retransmit correction data.	

If the SIM card is in the receiver, choose **Receiver network**. If the data connection is in the data collector, choose **PDA network**.



If you choose Receiver network, click on the 🖞	APN button:
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Access point	
simbase	
Dial number	
*99#	
Username	
Password	
	y _{yy} r.

the Access point must exactly match the APN required for your SIM card. The Dial number is typically *99#.For most SIM cards issued in the USA, the Username and Password will be blank. If you change the APN, the power on the cell modem must be cycled. Enabling the Cycle power on cell modem option will automatically perform the modem reboot.

Click Set to push the APN to the modem and return to the Data link parameter menu:

Domain/IP	
APIS1.huace.cn	
Port	
9901	
GNSS base SN	
3738992	8
Retransmit correction data.	\bigcirc

The **Domain/IP** and **Port** must match the value specified on the Base. The **GNSS** base SN must match the serial number of the Base.

Leave Retransmit correction data disabled.

Click **Next** to move to the Rover parameters dialog:

	apio monumento preme
Elevation mask	
10	0
Position output frequency	
5 HZ	×

Set a reasonable Elevation mask. Choose **5Hz** for the **Position output frequency**. Click **Save & Accept** to apply the settings and connect the Rover to the APIS server.

Setting up instrument
Cancel
Accept successful.

If the Base successfully connected to the APIS server, after a few moments the Rover will begin to receive corrections and should FIX:

Receiver network 30/38 Fix V: 0.070	0 📱	,82% 🗧	දියි rk 30/38		H: 0.051 V: 0.070
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Connecting foreign (non-CHC/iGage) receivers to APIS

The APIS cloud component also has a standard NTRIP output server. So, it is possible to use the normal NTRIP client found in every other modern field software to receive corrections from an APIS base.

First make sure the APIS base is configured to broadcast RTCM3.2, not CHC516 format.

The connection information for an NTRIP client is:

IP:	apis1.huace.cn	
Port:	2201	(subtract 7700 from the APIS port the Base uses)
UserID:	1	
Password:	1	

For example, in X-PAD this would be the server:

X	Modify APIS1.HUACE	
Name	APIS1.HUACE	
Mode	NTRIP	🗸
IP	apis1.huace.cn	
Port		2201
UserID	1	
Password	1	

This would be the profile:

	RTK GPRS	
Server	APIS1.HUACE	🗸
Mountpoint	3738992	>
Format	RTCM3	v

Where the Mountpoint is typed in as it is not possible to download a mount table from APIS.