Quick Start

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Quick Start Guide
For Tersus GeoBee30
Cost-effective solution for CORS

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More details, please visit www.tersus-gnss.com

!	Note: David30 GNSS receiver and Ntrip Modem TR600 are configured well before shipping. Please set up the system according to Chapter 1, David30 and Ntrip Modem TR600 are ready to work normally after power on.

1. GeoBee30 System Set up

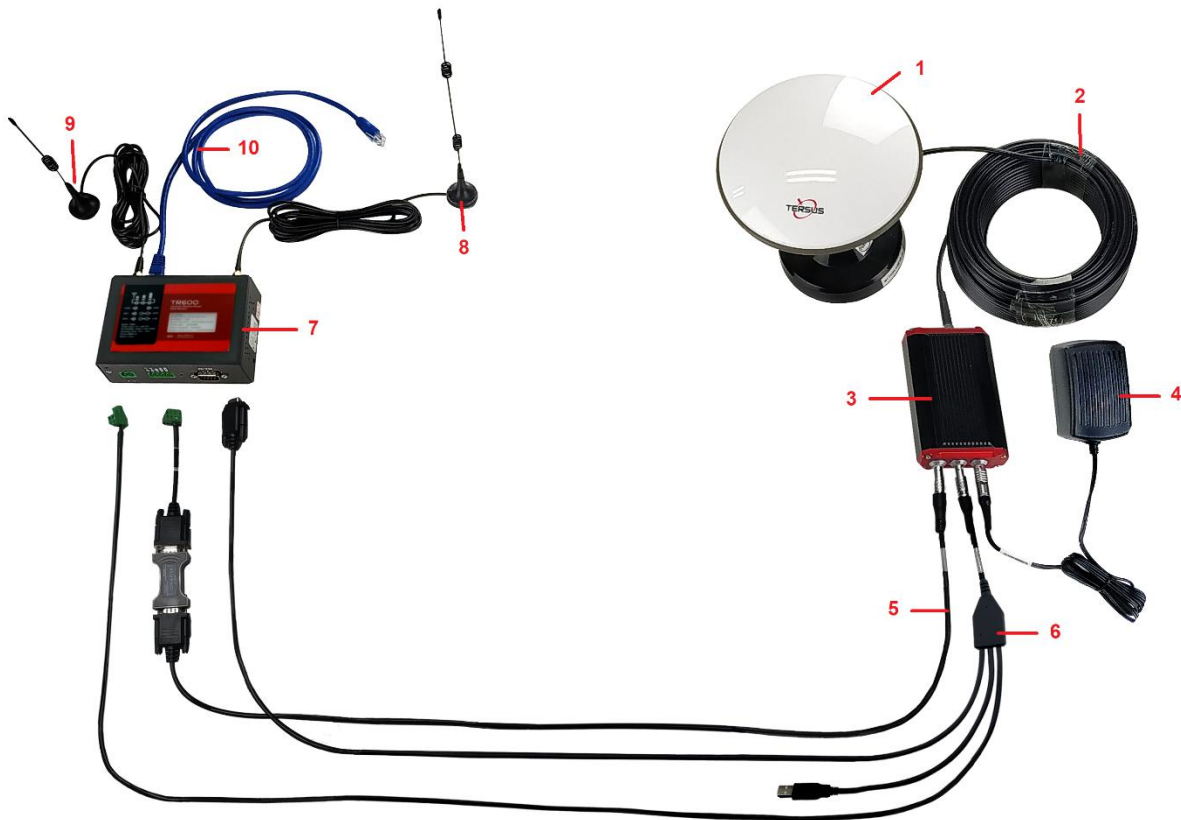Set up the GeoBee30 system following the figure below, and power up the system.

Figure 1 GeoBee30 System Set up

No.	Name
1	Antenna (AX4E02 in the figure above, customizable)
2	TNC-J to TNC-J cable (GNSS antenna cable, 25m by default, customizable)
3	David30 GNSS Receiver
4	Power Adapter (short for 'DC-5pin AC Power Adapter with 1.2m cable')
5	COMM1 cable (short for 'COMM1-7pin to DB9 male cable')
6	COMM2 cable (short for 'COMM2-7pin to TR600-DC-2pin & DB9 female & USB cable')
7	Ntrip Modem TR600
8	4G antenna for TR600
9	Wi-Fi antenna for TR600
10	Ethernet cable 1.5m

Note:

1) There are two configuration modes for GeoBee30. GeoBee30 system is zero configuration if customer adopts GeoCaster provided by Tersus GNSS Inc., as GeoBee30 is pre-configured when shipped out of factory. GeoBee30 system needs to be configured if customers demand to set up caster by themselves. This quick start is to introduce the first mode – using Tersus GeoCaster service.

2) David30 GNSS receiver uploads RTCM stream to the NTRIP caster using Ethernet (default) or Wi-Fi or 2G/3G/4G sorted by priority.

    a. When using Ethernet to configure TR600, use Ethernet cable to connect the LAN2 port of TR600 to your computer, connect LAN1/WAN port to a router to access internet. Make sure the IP address of your computer is set as "Obtain an IP address automatically". Type **192.168.100.1** in your browser, use username "**root**" and "**1234**" to enter web config page, make sure the DHCP is on in LAN setting so that TR600 can automatically obtain an IP address.

    b. When using Wi-Fi to configure TR600, search SSID "TR-600" on your computer and connect it use password **12345678**. Type **192.168.100.1** in the browser of your computer or mobile phone or tablet, use username "**root**" and "**1234**" to enter web config page.

       Please note, both Wi-Fi client and Wi-Fi hotspot of Ntrip Modem TR600 are supported, however they cannot be enabled simultaneously. Wi-Fi hotspot function is to share internet connection to other devices or configure TR600 via Wi-Fi. Wi-Fi client function is to use Wi-Fi connection to communicate with caster when Ethernet connection is not available.

       When using Wi-Fi to communicate with caster, choose Wi-Fi Client to access internet in Network Settings of TR600. Select a SSID to be used and type the Wi-Fi password in the PSK pin area, click [Save] to save this setting.
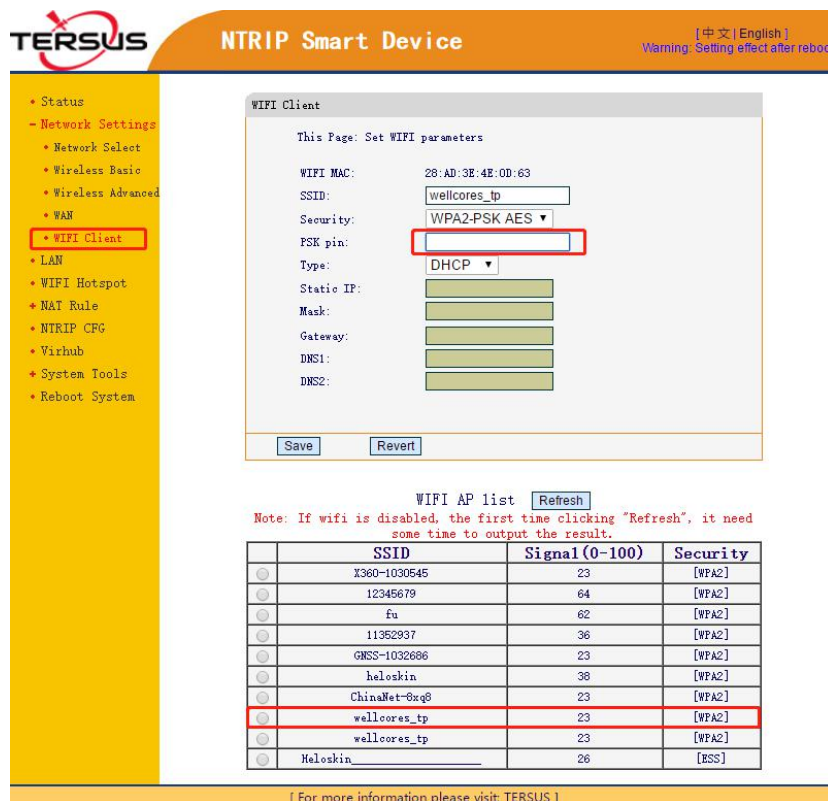

Figure 2 Wi-Fi client setting

c. When using 2G/3G/4G network for data transmission, GeoBee30 will consume no more than **3GB** mobile data per month. Please contact with your local mobile carrier if there is any restrictions on wap or data usage.

3) Place the antenna (AX4E02 in the Figure 1) in the outdoor open environment. Install Wi-Fi antenna when Wi-Fi connection is for data communication, and set TR600 as Wi-Fi client. Install 4G antenna when 2G/3G/4G SIM card is used for data communication.

4) GeoBee30 starts to work in auto start mode by default once it is powered up. According to the autonomous positioning (without RTK or DGPS), it smoothes out the average value to be the base coordinate. GeoBee30 outputs the RTCM32 corrections data and sends to the Ntrip server through LAN, WIFI or 2G/3G/4G mobile network.

5) For the **known** phase center coordinates of the AX4E02 antenna, the two configuration methods are as follows:

a. Use the COMM1-Bluetooth module in the package, unplug the COMM1 cable and insert the Bluetooth module to the COMM1 port of David30 GNSS receiver. Launch Nuwa app on an android device, connect David30 by paring Bluetooth. Create a base configuration with manual start in radio mode[1], fill in the base coordinates, antenna height and Ntrip network information. Detailed operation refers to *User Manual for David30 GNSS Receiver*. After completing the configuration, disconnect the Bluetooth connection, disconnect the Bluetooth module and connect back the COMM1 cable.
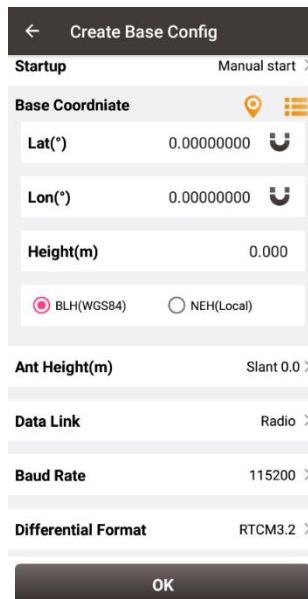

Figure 3 Configure David30 using Nuwa app

Note1: Use Radio Mode in Nuwa when configuring GeoBee30. Because the external radio and TR600 are both external data link, the principal is the same (log the data from David30 to external data link).

b. Use the 'DB9 Female to USB Type A Male converter cable' to connect the COMM1 cable in Figure 1 and a computer, open Tersus GNSS Center application on the computer, and type below commands in the command window:

UNLOGALL   //remove all logs
UNDULATION USER 0.0   //Set user specified undulation value for ellipsoid height[2]

```
        FIX POSITION B L H          // B: latitude (degree), L: longitude (degree), H: height (m)
                                     For example: FIX POSITION 31.24523012 121.58922341 40.35
            or POSAVE ON 0.02        //Turn on position average for 0.02 hour (72s)
        LOG COM2 RTCM1006 ONTIME 10    //output the base coordinate
        LOG COM2 RTCM1074 ONTIME 1     //output GPS observations
        LOG COM2 RTCM1084 ONTIME 1     //output GLONASS observations
        LOG COM2 RTCM1094 ONTIME 1     //output Galileo observations
        LOG COM2 RTCM1114 ONTIME 1     //output QZSS observations
        LOG COM2 RTCM1124 ONTIME 1     //output BeiDou observations
        LOG COM2 RTCM1230 ONTIME 10    //output GLONASS bias information
        LOG COM2 RTCM1033 ONTIME 10    //output antenna, receiver information
            (Below commands output ephemerides, not default configuration)
            LOG COM2 RTCM1019 ONTIME 5    //GPS ephemerides
            LOG COM2 RTCM1020 ONTIME 5    //GLONASS ephemerides
            LOG COM2 RTCM1042 ONTIME 5    //BeiDou ephemerides
            LOG COM2 RTCM1044 ONTIME 5    //QZSS ephemerides
            LOG COM2 RTCM1046 ONTIME 5    //Galileo ephemerides
        SAVECONFIG                  //save configuration
```

Note2: If customer needs to use global geoidal height model EGM96 for mean sea level height, type below command to replace the undulation command above.

UNDULATION EGM96   //Set EGM96 geoidal height model

More details about logs and commands refer to *BX40C log & Command document*.

Power cycle the receiver or input RESET command to make the above configuration effective.

6) The known phase center coordinates of the AX4E02 antenna can be obtained from surveying and mapping department of local government, or calculated from commercial software such as Bernese or Gamit.

7) If customer needs GeoBee30 work with local CORS system, calculate the accurate coordinate of the base station under the local CORS framework and configure the base station with this accurate coordinate. The calculation to obtain this accurate coordinate can be PPP method and coordinate conversion via point correction using Nuwa app. You can contact Tersus technical support for detailed method.

2. Status Check

2.1 Check the status of Ntrip Modem TR600

The number of signal lights on determines the signal strength of 2G/3G/4G mobile network. When using Ethernet to access to the Ntrip server, the signal lights are off. The PWR is steady red to indicate GeoBee30 is powered normally, ERR is off to indicate GeoBee30 is not at abnormal state. The NET is steady green to indicate that it is connected to Internet. The SVR1 is steady green to indicate that it is connected to the Ntrip Caster normally. The SVR2 is steady green to indicate that it is connected to the mserver (a remote control terminal) normally. The LAN1 is steady green to indicate that the Ethernet connection is normal.

2.2 Check link status using browser

Open any browser on your computer (accessible to the Internet) and enter the following URL in the address bar:
http://geobeecaster3.tersus-gnss.com:2101/
In the login window, type the (Ntrip) Client User and (Ntrip) Client Password which are shown on the label of the Ntrip Modem TR600.

```
NtripName:
geobeecaster3.tersus-gnss.com
NtripPort:  2101
Server Password: geobeetest@xyz12345
Client User: geobeetest
Client Password: xyz12345
Default Mount Point: 240305005050000
```

Figure 4 Label on Ntrip Modem TR600

After a successful login, the link status and statistics are shown as the figure below:

Current Time:19-03-19 03:56:19(-0000)

Server/Client Current Status

S/C	From IP	MountPoint	StartTime	Data Bytes(KB)	DataType	lat/long/ellipsoid height
Server	221.178.124.152	2403050050	19-03-19 02:02:35(-0000)	2896.824	RTCM3	594690/1 883409/107.4092

Statistics

MountPoint	First Start Time	PAS Count/ideal	total online rate(%)	Error/Valid Package	lat/long/ellipsoid height
2403050050	18-12-13 02:52:14(-0000)	2569/4610	55.74	0/15265991	594690/1 883409/107.4092

2403050050 Hourly online rate from 03/17 to 03/19(-0000)

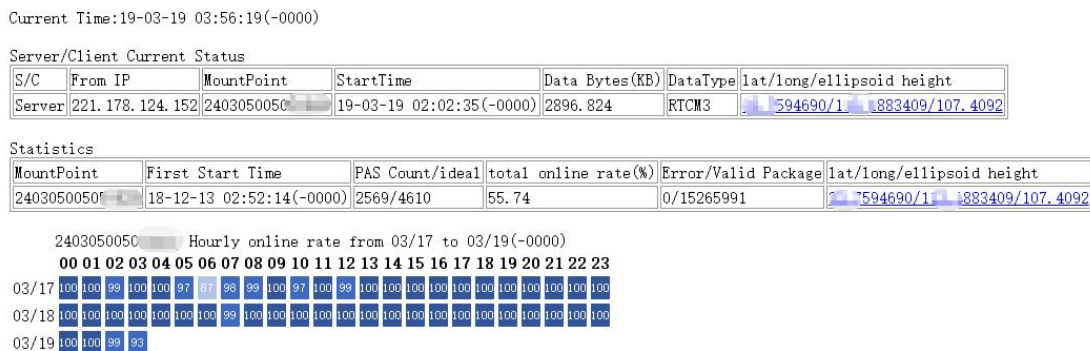|	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
03/17	100 100 99 100 100 97 87 98 99 100 97 100 99 100 100 100 100 100 100 100 100 100 100 100
03/18	100 100 100 100 100 100 100 99 100 100 100 100 100 100 100 100 100 100 100 100 100
03/19	100 100 99 93

Figure 5 Example of http status view

In the first table, the second row shows the current online device. If there is no online device, this table only shows one row of title bar. S/C means Server or Client, Data Bytes indicates the amount of data transmission from a base or data reception from a rover, the last column shows the calculated coordinates.

In the second table, it shows the detailed statistics of the server of client, including mount point, start time, accumulated count, total online rate, error package out of valid package, and coordinates.

The area below the two tables shows the hourly online rate in recent three days.

3. Get More

This Quick Start Guide introduces the easy operating process of the survey for getting started only.

The user manual and firmware for the specific model can be downloaded from Tersus official website:

www.tersus-gnss.com/support.

4. Exemption of Liability

Before using this product, please be sure to read the product manual carefully, which helps you to better use the product. Tersus is not liable for damages caused by failure to follow the instructions in the manual.

Tersus is committed to continually improving product features and performance, and the contents of subsequent product manuals are subject to change without notice. If the pictures and icons in the manual are different with actual product, please refer to the actual product.

5. Technical Support

Thank you for using Tersus products. If you have any technical questions or suggestions for the products, you can send email to support@tersus-gnss.com and we will serve you promptly.