

Trimble GPS Overview

Brady Johnson
October 8, 2010

Trimble NetRS Interface

- Materials Needed
 - Computer
 - Cat-5 Ethernet cable (located with each receiver, in the Pelican case)
- Note: While it might not be absolutely necessary, connection via Ethernet cable has worked better when the connected computer has a static IP address set. If you experience problems connecting, try setting a static IP and disabling any wireless communications
- Plug Ethernet cable from power connection on receiver to computer (Figure 1)

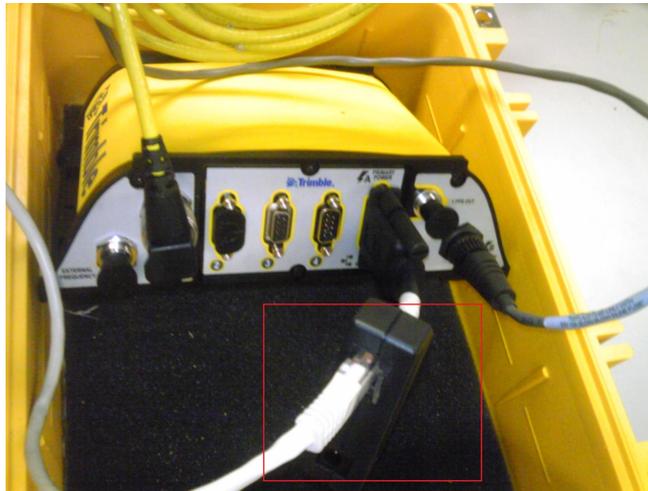


Figure 1. Connection panel for Trimble receiver. Connection can be made through Ethernet cable (preferred) or serial cable.

- Open an Internet browser and navigate to <http://192.168.1.10>
 - If the Trimble home screen does not open, close the browser, wait a minute, and repeat the previous step
 - When connected, the home screen (Figure 2) will provide the receiver details
 - * The serial number on the home screen should match the receiver. The default system name for all receivers is the serial number.
- The left hand menu provides details about the receiver configuration and allows the user to view real-time satellite information when connected to an antenna.

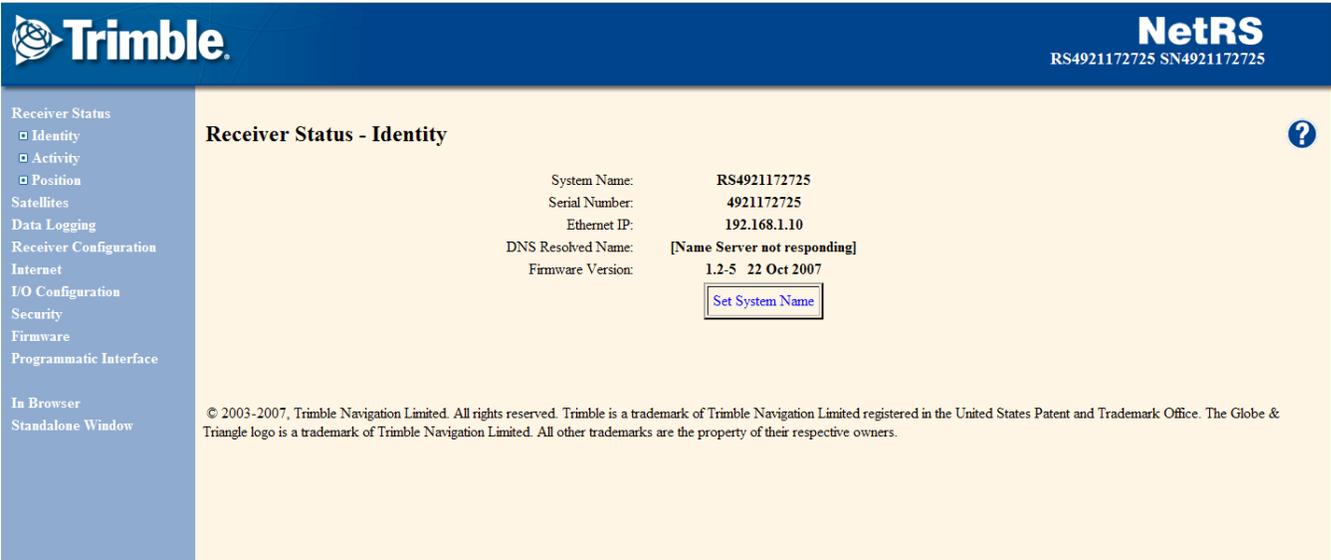


Figure 2. Screen shot of the Trimble home screen displaying receiver details

- Click ‘Satellites’ to display the current configuration of satellites and to view the satellites that are currently sending information to the antenna
 - * Reviewing this information during field setup is important to ensuring your location has a clear sky view
 - Note: 8-10 Satellites seems to be common for relatively open spaces
- Click ‘Data Logging’ to view your current recording session
 - * Powering up the receiver will usually start the last logging program loaded to the receiver but clicking through this at setup will ensure the correct configuration file is running and data files are being saved
 - * The ‘Session Name’ shows the current test (configuration file) that is running.
 - * Click the test name to view the specifics
 - Current default is set for longer deployments with continuous collection of satellite information but data files saved at 10 min intervals. Minimal pre-processing options are applied at the receiver but can be applied using Trimble Business Center processing software.
 - If you wish to make changes to this file, make sure to save the new file using a different name so others configuration files are not overwritten
- Under ‘Data Logging’ on the left hand menu, click ‘Data Files’ to view the receiver memory.
 - * Folders are created for each month with a sub folder for each day. Click through to the current day and time to ensure your data are being recorded and files are being created.
 - * An example file path is shown in figure 3. Default file names include the receiver name (RS4921172725), date (20101006; October 06, 2010) and time (13:50 UTC).

Receiver Status

Satellites

Data Logging

- Status
- AutoDelete
- Power Saving
- Data Files

Receiver Configuration

Internet

I/O Configuration

Security

Firmware

Programmatic Interface

In Browser

Standalone Window

Logged Data Files ?

Logging Space: 75.676 Mbytes Used. 800.199 Mbytes Available

Directory path /201010/06/a/
0 subdirectories and 41 files.

Name	Modified	Size	Delete
Parent Directory	06-Oct-2010 13:56		
RS4921172725201010061350a.T00	06-Oct-2010 13:59	27K	
RS4921172725201010061400a.T00	06-Oct-2010 14:09	58K	
RS4921172725201010061410a.T00	06-Oct-2010 14:19	81K	
RS4921172725201010061420a.T00	06-Oct-2010 14:29	83K	
RS4921172725201010061430a.T00	06-Oct-2010 14:39	87K	
RS4921172725201010061440a.T00	06-Oct-2010 14:49	90K	
RS4921172725201010061450a.T00	06-Oct-2010 14:59	91K	
RS4921172725201010061500a.T00	06-Oct-2010 15:09	92K	
RS4921172725201010061510a.T00	06-Oct-2010 15:19	97K	
RS4921172725201010061520a.T00	06-Oct-2010 15:29	97K	
RS4921172725201010061530a.T00	06-Oct-2010 15:39	96K	
RS4921172725201010061540a.T00	06-Oct-2010 15:49	98K	

Figure 3. Screen shot of the Trimble home screen displaying receiver details. Files can be saved directly from this screen.

- * Data can also be downloaded directly from the ‘Logged Date Files’ screen. If you don’t have many files to download, the easiest way to get the files is to right-click the file name and save the file to your computer.
 - For larger sets of data, FTP can be used to automate the downloading process

Creating files to upload to OPUS

Overview

Introduction text from: <http://www.ngs.noaa.gov/OPUS/about.html>

This Online Positioning User Service (OPUS) provides you with simplified access to high-accuracy National Spatial Reference System (NSRS) coordinates: all you need is a clear view of the sky and a survey-grade Global Positioning System (GPS) receiver.

OPUS processes your GPS data files with the same models and tools which help manage the Nation's Continuously Operating Reference Station (CORS) network, resulting in coordinates which are both highly accurate and highly consistent with other users. Your computed NSRS position is sent privately via email, and, if you choose, can also be shared publicly via the NGS database.

- Materials Needed
 - Computer
 - Trimble Data files (filename.T00)
 - RINEX conversion Software
 - * http://www.trimble.com/trimblerinex_ts.asp
 - Dat2Rin software (including rinmerge.exe)
 - * http://www.trimble.com/support_tr1.asp?Nav=Collection-3621
- Note: There are surely other ways around this process of converting raw files to RINEX files to piece together 10 min data to longer sets to upload to OPUS. If you find (or know of) a routine less laborious please pass it on. That being said, the following routine works and allows the user to join (or segment) periods of time that can be beneficial to processing using OPUS or Trimble Business Center (TBC)

Convert to RINEX

- Open Convert to to RINEX Program
 - Under 'File', select 'Open'. Select all files from the station.
 - The files will be scanned and you will be able to view data associated with each file
 - * The file name can be changed by clicking to the right of the 'RINEX file name w/o extension' field. A shorter (or more descriptive name) can be helpful in merging the files as that process is DOS based.
 - * Under 'File', select 'Convert Files'

- The files are now in RINEX form and could be uploaded to OPUS if they were of appropriate length.
 - * OPUS uses two processors for computing absolute position
 - Rapid Static requires single data files between 15 mins and 2 hours
 - Static requires data greater than 2 hours

Merging Data files

- Place rinmerge.exe in the folder(s) containing your raw data files
- Open a DOS prompt and navigate to your RINEX files (We'll be using the .10o files)
 - To combine 3 files into one file (mergedfile.10o) type the following command (spacing is important)
 - * `rinmerge filename1.10o+filename2.10o+filename3.10o mergedfile.10o`
 - Warnings may appear in the DOS window pertaining to Unexpected Leap Seconds or unrecognized records in headers but should be followed by a 'File merge successful' output.
 - * Tip: The program has a tendency to crash when combining numerous files (7+). With 10 minute data files, I typically merge the files into hourly files, then combine hourly files into a daily file for upload to the Static OPUS processor.
 - The new file (with your given filename) should be in your folder and ready for upload to OPUS

Upload to OPUS

- Navigate to <http://www.ngs.noaa.gov/OPUS/index.jsp> (figure 4)
 - The 'View' and 'About' tabs have a wealth of knowledge and links about how OPUS works and links to other sources of information about processing and creating files for upload
 - Enter the email address you want your solution sent
 - * Note: OPUS doesn't recognize my @u.boisestate.edu account. Maybe an isolated incident (maybe not) but just use another email if you get an 'unrecognized email' error
 - Upload your merged .10o file
 - * You can upload multiple .10o files through a single .zip (must be .zip). Doing this will not join .10o files. Each one will be processed separately and you will receive individual reports for each file in the .zip
 - Select the TRM41249.00 Trimble Zephyr Geodetic with GP. This will include the offsets listed on the antenna in elevation calculations



OPUS: Online Positioning User Service

[upload](#) | [view](#) | [about](#)

compute an accurate position for your GPS data file

1. enter your [email address](#)
johnson.bradya@gmail.com
2. attach your [DATA file](#) of GPS obs, dual-freq.(L1/L2) only
C:\Users\Brady\Desktop\2010 Well Dat |
3. select your [antenna type](#)
TRM41249.00 | Trimble Zephyr Geodetic with GP
4. add your [antenna height](#)
.710 meters

5a. customize your solution, report, and publishing [options](#)

-or-

5b. choose a [processor](#)
 for data > 15 min. < 2 hrs.
 for data > 2 hrs. < 48 hrs.

Figure 4. Upload screen for OPUS

- Add the antenna height based on the measurement you made in the field. The antenna height is the distance between your measuring point and the base of the antenna (or top of the tripod mount)
- Select a processor to use based on the length of your record and an email will be sent within a few minutes
 - * The options button allows you to select specific CORS to use (default option will pick the nearest operating stations) along with some specific projection objects. Most useful of the options is the ability to receive an .xml file of the results. TBC allows for the direct upload of .xml files which can serve as checks (or absolute positions) for baseline calculations.