

Accessing the Real Time Network (RTN)

The GCGC Real Time Network (RTN) is a free service that can be accessed by completing the registration form at the following link: <http://rtn.usm.edu/RegisterAccount.aspx>. Once registered, users will gain access to real-time corrections for your GNSS rover when it is connected to the RTN.

Registered users can also download RINEX data files for post-processing static GNSS observations from the Reference Data Shop on the website. Additionally, users have access to a special service called Virtual Reference Station (VRS) through our Reference Data Shop, which allows users to generate a VRS file for a specific location.

Please note that end users can register for more than one ID; however, each ID must be linked to a unique email address.

NTRIP and Mountpoints

How to Log-in to the NTRIP caster for real-time corrections

Registered users with active subscriptions can log in to the GCGC NTRIP caster to receive real-time corrections for their field rovers by using the following information in their NTRIP client settings:

NTRIP Login ID *** (system generated email when account was created)**

NTRIP Password *** (system generated email when account was created)**

Host Address: RTN.USM.EDU

Port Address: 2101

What are Mountpoints?

A mountpoint specifies the type of processor used, the supported satellite constellations, the format of the correction messages, and the reference frame associated with a real-time data stream. When connecting to the GCGC Real-Time Network, a list of mountpoints is generated, from which the user can select the desired option. However, if a mountpoint is hardcoded in a rover setup, the mountpoint list will not be displayed.

Mountpoint Naming Convention:

Each character grouping is separated by an underscore before the next set of characters.

1. CORRECTION TYPE_2. SATELLITE CONSTELLATIONS_3. MESSAGE FORMAT_4. REFERENCE FRAME
VRS_GNSS_RTCM34_NAD83

1. Correction Type

- VRS – RTX Network Processor for network corrected positions
- NSB – Nearest Single Base

2. Satellite Constellations

- GNSS – GPS+GLO+GAL+BDS
- GPGL – GPS+GLO

3. Message Format

- CMRp - Trimble (CMR Plus) legacy format for compact, precise RTK corrections.
- CMRx – Trimble latest format for all GNSS constellations.
- RTCM23 – Legacy version of RTCM that supports GPS and GLONASS.
- RTCM31 - It supports multiple constellations, including GPS and GLONASS.
- RTCM34 – Backwards compatible with RTCM 3.3 and 3.2 with MSM (Multi-Signal Messages) support for all GNSS constellations.

4. Reference Frame

- NAD83 - North American Datum of 1983 - NAD 83(2011) epoch 2010.00

1. CORRECTION TYPE:

VRS or **NSB** are the current processing methods that you can choose:

VRS or **Virtual Reference Station**: Uses a Network RTX Processor to create a Virtual Reference Station and applies network corrections in RTX accuracy from the parent processor to the receiver data.

NSB or **Nearest Single Base**: Selects the nearest suitably operating reference station using the position reported by the rover and propagates that receiver's observation data to the rover.

2. SATELLITES (SVs):

NSB: Mountpoints with SB in the name use both GPS and GLONASS SVs in the solutions.

VRS: Mountpoints with VRS in the name include 4 satellite constellations, which include GPS, GLONASS, Galileo and BeiDou, Satellite Vehicles in their solutions.

3. MESSAGE FORMAT.

The following explains each available format:

CMRx is the latest proprietary format from Trimble for Network RTK mountpoints. This format allows Real-Time Kinematic (RTK) users to access a greater number of satellite constellations and signals as they become available, leading to faster initializations and enhanced performance, especially in challenging environments like areas with obstructions or under canopies. Additionally, CMRx provides significant compression—approximately 40%—compared to the already compact CMR/CMR+ formats, which helps users receive corrections using less bandwidth. Trimble rovers that support CMRx should use this format exclusively.

RTCM 3.1 provides carrier and code differential corrections for high-precision applications such as RTK, Network RTK, and PPP.

RTCM3.4 (including RTCM 3.2 and 3.3) Has recently been modernized with Multiple Signal Messages (MSM), which allow for the inclusion of new constellations and signals. Currently, MSM supports GPS, GLONASS, Galileo, QZSS, BeiDou, and SBAS.

CMRPlus Network RTK mountpoint: This mountpoint is designed for legacy equipment in industries where CMR Plus has been used as a quasi-standard format, such as precision agriculture. Since CMR Plus is a Trimble format, non-Trimble users are advised to use the RTCM 3.x format unless they are certain that their device fully supports CMR Plus.

4. REFERENCE FRAME e.g.: NAD83

NAD83 represents the reference frame, which is specified in the mountpoint names to help users easily differentiate between the datum used. GCGC can accommodate any reference frame that users may need to work with. If we receive requests for additional reference frames or if the National Geodetic Survey (NGS) publishes a new datum, we can incorporate these options. This will allow users to easily identify the reference frame in use by looking at the end of each mountpoint name.

Recommended Survey Mountpoints:

- Trimble Rovers – VRS_GNSS_CMRx_NAD83
- Other Rovers – VRS_GNSS_RTCM34_NAD83

Available Mountpoints

Mountpoint Name	Correction Type	Constellations	Reference Frame	Epoch
VRS_GNSS_CMRx_NAD83	VRS - Network	GPS, GLO, GAL, BDS	NAD83(2011)	2010.00
VRS_GNSS_RTCM34_NAD83	VRS - Network	GPS, GLO, GAL, BDS	NAD83(2011)	2010.00
VRS_GPGL_CMRp_NAD83	VRS - Network	GPS, GLO	NAD83(2011)	2010.00
VRS_GPGL_RTCM23_NAD83	VRS - Network	GPS, GLO	NAD83(2011)	2010.00
VRS_GPGL_RTCM31_NAD83	VRS - Network	GPS, GLO	NAD83(2011)	2010.00
NSB_GPGL_RTCM23_NAD83	NSB - Single Base	GPS, GLO	NAD83(2011)	2010.00
NSB_GPGL_RTCM31_NAD83	NSB - Single Base	GPS, GLO	NAD83(2011)	2010.00
NSB_GNSS_RTCM34_NAD83	NSB - Single Base	GPS, GLO, GAL, BDS	NAD83(2011)	2010.00

Legacy Mountpoints that will be removed from list 1/31/2025

- SB_RTCM23
- SB_RTCM31
- CMRPLUS_VRS
- CMRX_VRS
- RTCM23_VRS
- RTCM31_VRS