

MnCORS/RTRN GNSS Network

The Minnesota Continuously Operating Reference Station/Real Time Reference Network Global Navigation Satellite System (MnCORS/RTRN GNSS) Network consists of over 130 permanent GNSS base stations, communications links, and server computers that together calculate corrections and send them to other mobile GNSS receivers in order to acquire real-time survey-quality field positions. Each CORS includes a highly accurate receiver that continuously collects radio signals broadcast by GNSS satellites. GNSS is comprised of multiple navigation systems to pinpoint the geographic location of a user's compatible receiver anywhere in the world.

The RTRN component of the MnCORS/RTRN/GNSS Network is the calculation of corrections that are sent to the RTRN users via cell phones or wireless modems. In the users' GNSS receivers, the correction messages are processed along with raw GPS/GLONASS positions to produce coordinates accurate to a few centimeters in real time depending on the features of your equipment. If your work demands accuracy in the range of 2-3 cm, you will need a dual frequency receiver. However, if your accuracy requirements will allow up to 1 meter of error, a single frequency receiver will suffice. Please contact your local dealer to check the compatibility of your particular equipment with the system.

Rinex data is available for post processing positions collected in the field to obtain higher accuracies after the satellite ephemeris have been adjusted. Rinex data can be obtained through our <ftp://ftp.olmweb.dot.state.mn.us/> where the data is available for about 10 months. For select sites that have been accepted into the National Geodetic Survey-National Spatial Reference System the data is available from the date of inception of the site into the federal network.

The MnCORS Network is a cooperative effort between MnDOT, other state agencies and institutions, counties, cities, tribal organizations, universities, and private enterprises with the goal of providing GNSS corrections state-wide with overlapping coverage in our neighboring states. Currently the network consists of 137 base stations of which; 120 stations are MnDOT, 9 stations are part of the Iowa CORS network that share data with MnCORS, and 8 stations are Wisconsin CORS owned. Base stations are located on MnDOT and County buildings as well as MnDOT Road Weather Information System (RWIS) sites. RWIS is an automated information system that collects, processes, and distributes current and forecasted weather and road surface information. Network maintenance will continue, and base stations may be added or moved to increase coverage and accuracy.

Since 2002 the system has seen exponential growth in use, the system has also been accessed over 1.5 million times with over 1.1 million hours of usage. Currently there are over 1,000 individual organizations and nearly 3,000 active users accessing the system on a yearly basis. About a third of the users are MnDOT and other public agencies such as: water resources, Federal Indian Health Services, Federal Aviation Administration, DNR, US National Park Service, IADOT, WIDOT, and the Metropolitan Council. Two thirds of accounts are private some of which include: engineering, surveying, utility location, waste management, transportation, telecommunications, smartphones, railroad, photogrammetry, mining, landscaping, pipeline, construction, and archaeological services. Agriculture accounts for a rapidly increasing percentage of private users. Currently about 47 percent of the private users are involved in agriculture, and they need 24-hour availability. Current staffing levels for the MnCORS/RTRN/GNSS Network cannot guarantee this kind service.

In order to receive a free account to access the MnCORS Network please visit our website <http://www.dot.state.mn.us/surveying/cors/index.html> for instructions on how to sign-up for an account. To register for a free account visit <http://mncors.dot.state.mn.us/RegisterAccount.aspx> or search "MnCORS" from your web browser. If your working group is comprised of multiple individuals who may be accessing the system simultaneously, it is recommended that each user register for their own account, providing minimally an organization name, first name, last name and email address. If one person is responsible for multiple GPS equipment setups that may be periodically reassigned, it is possible to create additional logins (Rover1, Rover2, etc.) under one supervisory user account. In this case, please contact us at CORSVRS.DOT@state.mn.us to discuss mutually agreeable login/password combinations.

Our FAQ site http://www.dot.state.mn.us/surveying/cors/mncors_faq.html can provide additional information about the MnCORS network. Answers pertaining to specific needs such as datums, adjustments, mountpoints, data formats, and calibration standards can be found on the site. The goal of the MnCORS Network is to reliably deliver low cost, accurate positioning and navigation solutions to the people of Minnesota and maximize the benefit to Minnesota's economy by maximizing use of the MnCORS Network. As always please feel free to contact the MnCORS team at CORSVRS.DOT@state.mn.us with any questions or comments.