



Support Bulletin

Penmap for Android - Trimble Correction Hub & RTX

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The following support bulletin explains how Penmap handles RTX data and its time dependent coordinate transformation. The transformation is performed by CoreX.

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Trimble Correction Hub

Trimble Catalyst works out-of-the-box with Trimble-provided correction services using the Trimble Corrections Hub. The Trimble Corrections Hub bundles access to Trimble VRS Now™ and Trimble RTX correction services. Your Trimble Catalyst subscription level determines the best accuracy that will be available to you, and Trimble Corrections hub automatically uses the best correction source available (from Trimble VRS Now, Trimble RTX-IP, Trimble RTX L-band and SBAS) based on your starting position and the environment of use.

What is RTX?

The Trimble Centerpoint RTX™ correction service is a high-accuracy, precise point positioning (PPP) system that provides real-time centimeter positioning without the need for an RTK base station or VRS network.

A Survey using satellite-delivered or Internet-delivered Trimble RTX corrections in open areas where terrestrial-based corrections are not available.

Coordinates measured in surveys using the Trimble CenterPoint RTX service are stored in the ITRF 2014 at measurement epoch (time). If your coordinate system needs another measurement epoch/ reference time frame you need a time dependent transformation.

How Penmap handles the time dependent transformation

Penmap has implemented the Trimble Geodetic Library. Penmap can handle time dependent transformations via CoreX.

Let's have an example:

Sam is using Catalyst and RTX in combination with local NAD83 frame and the local coordinate system US State Plane 1983 in Penmap

1. Incoming RTX data is in ITRF 2014
2. with the information of "From global reference" from the coordinate system the incoming coordinates are transformed from ITRF2014 to the local frame from NAD83 and
3. In a second step the coordinates are projected to the US State Plane 1983 system.

If you connect to an RTK source e.g. VRSNow directly there is no datum transformation like in step 2 needed. Just a coordinate projection .

If the Penmap project is configured correctly you end up in the system as configured in Penmap - independent of the GNSS source frame.

Coordinate system definition

To check the coordinate system you can have a look into the Coordinate System Manager. The current installation can be found [here](#). Trimble coordinate systems include:

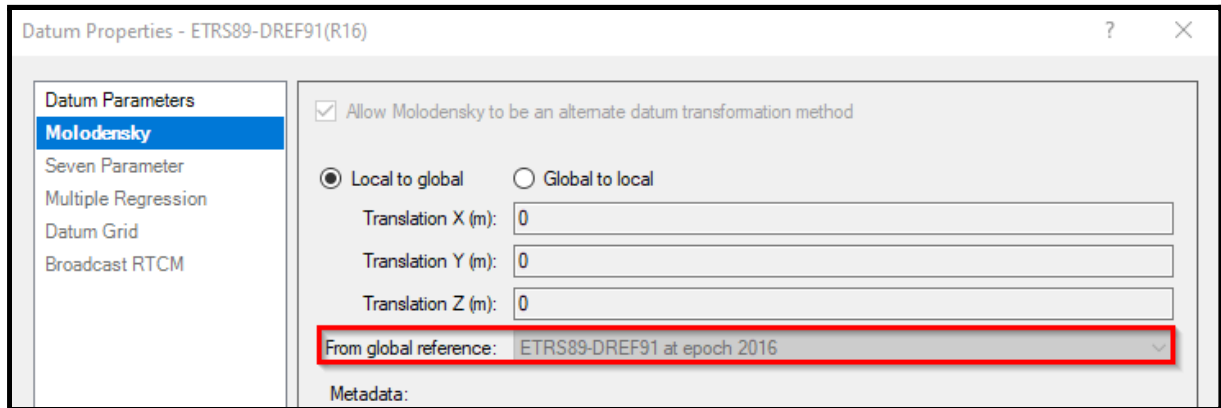
- **Datum Transformation parameters:** required to convert GNSS Coordinates to Local latitude, longitude and height.
- **Projection parameters and geoid model:** required to convert Local coordinates to final Easting, Northing and Elevation.

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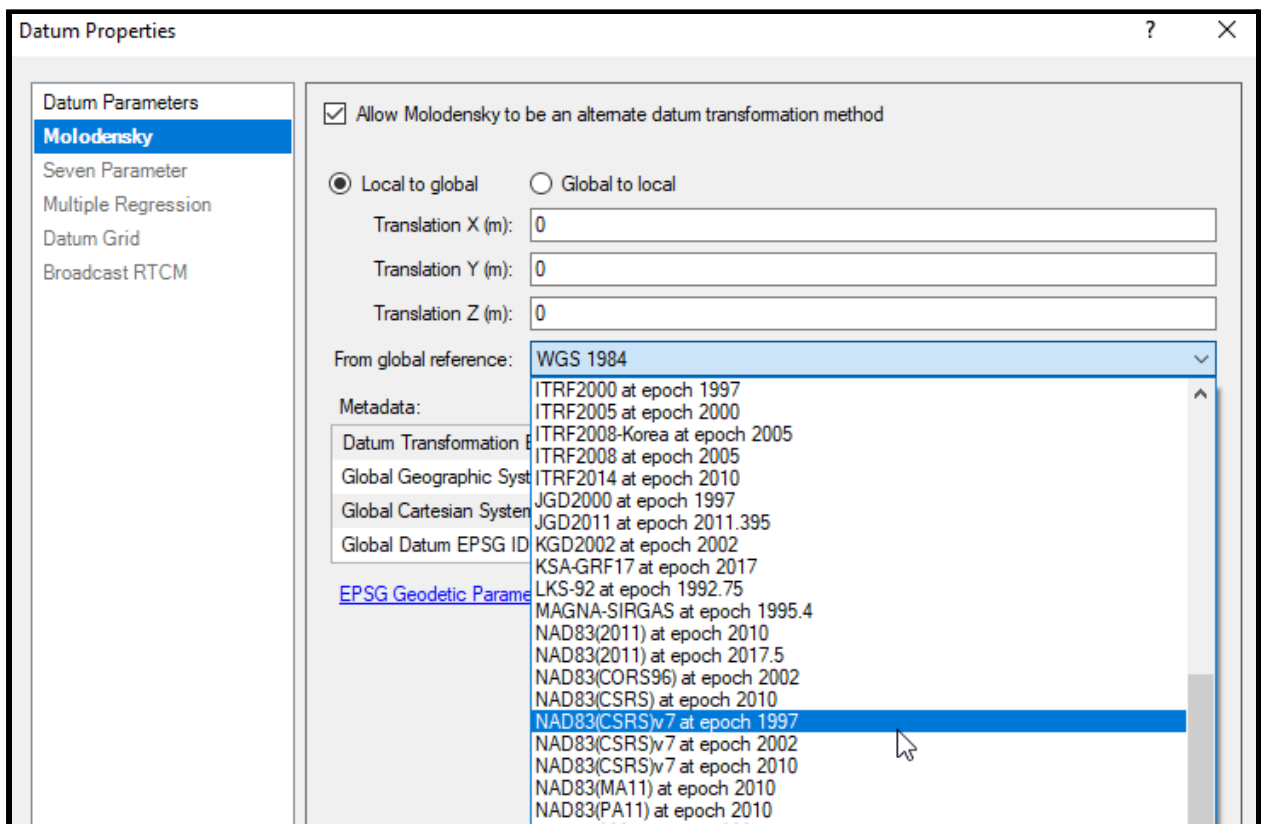
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In the **datum** definition you see “From global reference”.



If you see there is a global reference with an epoch, the time dependent transformation is available for your coordinate system using this datum.

If you need to create a user defined coordinate system, you can define the time dependent transformation creating the datum. You can find all possible time dependent transformations at **Datum Properties | Datum Transformation | “From global reference”**.



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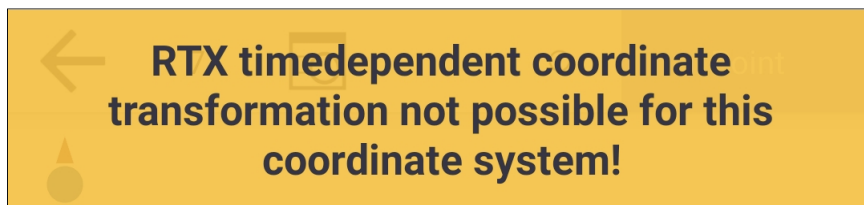
If "From global reference" is not shown or you've only WGS84 in the selection please update Coordinate System Manager and Database.

Note: For some coordinate systems it is not possible to create a time dependent transformer (example: CRS "World Wide UTM" with datum "WGS1984").

The reason for that is, the datum "WGS1984" has no linked reference frame. WGS84 datum is also a global frame like ITRF2014 with differences around 10 centimeters accuracy.

Is it possible to measure with RTX if the time dependent transformation is not available?

Penmap gives the notification that the time dependent transformation is not possible if it's not defined in the coordinate system.



It's possible to measure in ITRF 2014 (RTX datum) but the coordinates may have a shift to your existing local datum.

In case your correction type is RTX only, it is possible to adjust the datum shift by using a site calibration via **Start GNSS | Calibration**.

***Note:** If you mix Ntrip/VRS and RTX without a time dependent transformation, the result is a mix of corrected coordinates in local datum and ITRF 2014. Depending on your local reference frame the offset between both can reach several decimeters.*

Contact

For more information or questions contact the Trimble Penmap community.

<https://community.trimble.com/groups/penmap-for-andriod>

<https://geospatial.trimble.com>

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