RTNet SOFTWARE

The main characteristics of the RTNet GNSS processing software are summarized as follows:

RTNet is primarily designed for real-time applications, but post-processing is possible.

RTNet meets the demands of GNSS network operators, surveyors, utilities, and scientists in operations and R&D.

RTNet can process data in network mode or in PPP mode in real-time or post-processing.

RTNet real-time results from one master - run (i.e. satellite clocks or tropospheric parameters) can be read directly as input by other slave - runs.

RTNet has RTK ambiguity resolution capability.

RTNet estimates DGPS corrections and generates corrections for network RTK.

RTNet processes zero-differenced observations and the satellite and receiver clock corrections are estimated at every epoch independently.

RTNet is designed for processing GNSS networks with the highest possible accuracy with the full variance-covariance and not only their baseline-related parts.

RTNet has precission orbit determination (POD) capability.

RTNet AT A GLANCE

Feature	Comment
Real-time	True real-time "stream" processing
Post-processing	Possible with RINEX files
Continuous	Seamless processing in file mode
Orbits	Precise orbits and/or Broadcast
POD	Precission orbit determination option available
GPS	Yes
GLONASS	Yes (no ambiguity resolution)
Galileo	Yes
Network mode	With "lambda" ambiguity resolution
PPP	Yes
RTK	Yes
PPP – AR	PPP with ambiguity resolution
Network RTK	Option available for real-time or post-processing
Clocks	Satellite and receiver clocks
Troposphere	Zenith delay & gradient parameter
Slant delay	Yes
Ionosphere	Absolute and relative model
DCBs	Yes
Communications	I/O by file and/or socket
O/S	Linux / Windows
User interface	GUI

Additional Information:
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Real-time Analysis

GNSS Software System

SURVEY

RTNet can serve the needs of Service Providers and Users. Applications for Service Providers:

- To operate a GNSS network and feed data into a hybrid queue that is capable to serve the data as both a time critical stream and a complete stream even with network interruptions.
- To generate DGPS or network RTK corrections.
- To generate real-time satellite clock, tropospheric, ionospheric state corrections for transmission to users.
- Optionally for precission orbit determination.

Applications for Users:

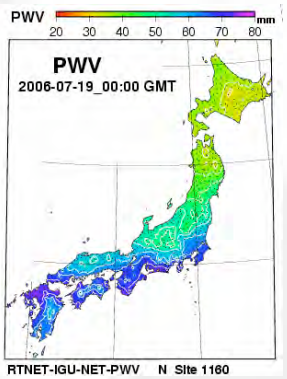
- Kinematic and static positioning in real-time or in post-processing
- RTK positioning
- PPP positioning
- Low-cost L1/CA receiver positioning

WEATHER

RTNet estimates the tropospheric zenith delay, the horizontal gradients, and the station to satellite slant delays in real-time. This can be done in PPP mode or in network mode. PPP mode requires accurate satellite clocks which can also be generated by RTNet.

True real-time generated tropospheric delays are immediately available for now-casting with application for flash flood warnings.

If real-time streaming data is not available, RTNet can be run in a near-real-time mode (NRT) where data arrive in batches of files every 15, 30, or 60 minutes. In the NRT mode RTNet processes one interval and then waits until the next file interval arrives, without resetting carrier phase ambiguities or the filter solution. This near-real-time processing mode is faster and more efficient than the commonly used methods of reprocessing several hours of data or stacking of normal equations.



All of Japan's 1300-station GEONET network can be analyzed by RTNet every 30 seconds in real-time with just one PC-type computer.

DEFORMATION

RTNet can monitor site motion in real-time. The range of motion that can be detected ranges from very slow mm /day level to rapid co-seismic deformation at the meter/second level.

Data from a network of stations is streamed to a processing center where it is processed and real-time station motion is displayed. Two solutions can be generated (1) Filter solution with lower noise and lower dynamic range; (2) Single Epoch solution which is noisier but has very high dynamic range.

Deformation monitoring is possible in PPP mode (for very large networks) requiring good real-time satellite clocks or, in network mode, with ambiguity resolution. Single frequency or dual frequency station data can be processed.

Potential deformation monitoring applications:

- Structure, Bridge, Dam
- Landslide, Subsidence
- Volcano, Earthquake
- Co-seismic Motion
- Tectonic Motion
- Ocean Buoy, Tsunami