



Application Note

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Product: ProMark3

Subject: Achieving Reliable Results with the ProMark3

- Make sure the operating system, GPS firmware, and application software are up to date.
- Study the manuals. Use them as training aids and problem solving tools.
- Use a SD card that has been properly formatted on the PC. Use Windows Explorer to check the SD card for errors. If the SD card has read/write errors when used on the PC it should not be used for field work.
- Turn on the ProMark3 and open the Settings window after it boots up.
- Open Date/Time and observe that the year, month, date, and time are set properly by the GPS receiver. The time required for this to happen may vary from a few seconds to five minutes. It is essential to let the GPS receiver set the clock. Do not set the clock manually.
- If the clock does not set properly within five minutes it is time to perform the Hardware Reset (page 252) and the GPSReset (page 255) as they are described in the ProMark3 reference manual. Check the Date/Time again and observe that the year, month, date, and time set properly before starting any application software.
- After starting the Surveying or Mobile Mapping software use the Sat Status and Position Nav Screens to evaluate the quality of the GPS solution. Strong solid signal strength bars on the Sat Status screen are essential. The Position screen needs to show a stable GPS solution. If the ProMark3 is being used with SBAS corrections the Nav Screen needs to provide indications that the SBAS is being used to compute a stable position.
- If the ProMark3 has been riding in a vehicle or used in some way that prevents a good solution give it time to get a good solution before logging survey data or starting a Mobile Mapping job file. If the solution is lost while data recording is in progress give the ProMark3 some minutes of good data before surveying a point or logging a feature. The solution improves with time and good GPS data coming to the ProMark3.

- When using FAST Survey use the Monitor/Skyplot screen to ensure that a good GPS solution is available. A wait for SBAS corrections will provide more accurate base station coordinates and faster fixed solutions for the RTK rover work.
- When field work is done close the open files and make an orderly exit from the application software. Shut down the ProMark3 with the desktop displayed.

Mobile Mapping

-Make sure the solution is good before starting a job file.

Improve the quality of the solution by using the ProMark2 or NAP100 external antenna.

Real-time

-If the job file is real time it is important to make sure a good solution is available for the real time results to have value. Use the NAV screens to evaluate the solution. PDOP and number of SV's alone do not reveal everything that needs to be known about the solution. Moving between features while maintaining a GPS solution helps to ensure good results. Before starting to log a feature give the ProMark3 a few seconds to stabilize on the point where logging will begin. Log a point feature for at least ten seconds. Enter attribute data or use the default values assigned by the feature library. If the logging interval of line and area features is set to time a stop at a vertex will result in point averaging for the duration of the stop if the GPS solution is good.

Post-processing

-Start a post-processing job file and record raw data for several minutes before logging the first feature. Five minutes in close proximity to the base station may be enough but a distant reference station may need at least 15 minutes of data to get good results. Maintain the best possible solution while moving between features to be logged. This has more to do with the fifteen minutes before logging a feature than the ten seconds of data that is recorded to log a point feature. Good raw data recorded for the fifteen minutes prior to logging a point feature is better than starting a 15 minute average on a point feature without a good solution already running.

-Move to where a feature will be logged and stop for a few seconds before starting to log data. As soon as the solution is stable start logging data. Stay stationary for a point feature while logging data for at least ten seconds. If logging a line or area feature a stop at a point along the line will engage point averaging if the logging interval option is set to time rather than distance. Pause line feature logging if the objective is to use point averaging at each vertex.

-After logging the last feature and before closing the job file record the same amount of good raw data at the end of the job file as was recorded at the beginning. This is typically 5 to 15 minutes of raw data that will enhance the quality of the backwards processing solution.

Surveying

-Assign a unique four character alpha numeric receiver ID to each ProMark3. Example: ABLE, BAKR, CHUK.

-Set the antenna type to match what is being used.

-Set the raw data interval to the same rate in each ProMark3. A faster rate, like 2 seconds, is appropriate for a Stop&Go survey that uses a 15 second stop. A slower rate, like 10 seconds, is appropriate for long static

sessions on long vectors. Short static sessions on short vectors may benefit from a 5 second raw data interval.

-When logging starts note the Julian day number assigned as the file extension. That number should typically match in all of the ProMark3 receivers used in the field. An exception would be one ProMark3 started before and another after midnight GMT.

-Make notes regarding obstructions that might block or reduce the quality of the GPS signals coming to the antenna. Extend the occupation times for sessions at difficult sites. Use the tools described in chapter 5 of the GNSS Solutions reference manual to analyze and clean up problem data.

-The radio or cell phone data link can be used with any of the application software to enhance real time accuracy while also recording data for post processing. Test the results to ensure effective use.

-Use a bipod with the rover pole when doing a Stop&Go or averaged points on a RTK survey to make certain the GPS antenna is stationary at each stop.

FAST Survey

-Use Monitor/Skyplot to see a good solution before setting the base for RTK work. Use it with the rover to evaluate the quality of the solution at the rover. Look for a low latency on the data link and strong signals from the SV's.

-FAST Survey can be used for survey data collection with point numbers and descriptors or for GIS data capture with attributes. Menu driven attribute assignment can be defined in the field. The feature code library file can be saved and used with a variety of projects or shared between FAST Survey users.

-The Geoids program that comes with GNSS Solutions will extract and transfer a geoid separation file to the ProMark3 allowing the use of elevations in the coordinate file and on the real time display of coordinates.

-State plane coordinate definitions can be enhanced with a localization to make sure the measurements match local bench marks and horizontal control.

-SBAS corrections used with Localization – Add Method 2 make it possible to do recon data collection, rough staking, and GIS data capture without being dependent on a data link or a fixed RTK solution. Data link range limitations fade away.

-Raw data recording while in FAST Survey makes it possible to combine post processing and precision RTK work.

-ASCII and shape file exports from FAST Survey make it easy to transfer job files to COGO and GIS software. Test the results using a different method to ensure accuracy of the data.