

Using MobileMapper Beacon with MobileMapper Pro

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What guidelines should I follow to ensure that everything is setup correctly for real-time corrections using the MobileMapper Pro and MobileMapper Beacon?

You should not have any problems using the MobileMapper Pro and MobileMapper Beacon if you follow the following set of instructions:

1. Turn on both the MobileMapper Beacon and the MobileMapper Pro.
2. Connect the two receivers using the appropriate cable (P/N 980816).
3. Set the MobileMapper Pro's Baud rate to 4800. (Press the **MENU** button, select the Setup option using the arrow button and then select the Baud Rate option. Highlight 4800 and press **ENTER**.)
4. Wait for the green light on the Beacon.
5. Press the MobileMapper Pro's **NAV** button until you get to the Position screen and check that "DGPS" appears in the middle of the screen.
6. Press the MobileMapper Pro's **LOG** button and begin recording data.

How accurate is the MobileMapper Pro when using MobileMapper Beacon corrections?

In general, you should expect accuracy in the 2-3 meter range 95% of the time. However, the factors affecting GPS accuracy are very complicated and it is hard to answer this question completely without recognizing what these factors are and what effect they have on GPS accuracy.

Multipath conditions – when GPS signals bounce off a building or hill and so take longer to reach the receiver than they would if they followed a straight path – are the biggest source of inaccuracy. These conditions are rarely the same for both the reference station and the rover receiver and so they cannot be removed by any differential correction technique – either real-time as with the MobileMapper Beacon or post-processed corrections as when using MobileMapper Office. Fortunately, the MobileMapper Pro's antenna was specifically designed to reject multipath signals when the receiver is held vertically. In addition, all National Difference GPS (NDGPS) reference stations are installed in areas with a minimum of multipath.

Solar storms can also affect GPS accuracy but they are comparatively rare. Most other environmental sources of GPS error are common to the reference station and rover and so are largely nullified by differential correction techniques.

The quality of the GPS receiver and the beacon signal are also major determinants of positional accuracy. Real-time correction with the MobileMapper/MobileMapper Beacon combination yields 2-3 meter accuracy under good-to-average environmental conditions such as near two-storey buildings and scattered trees. Increasingly dense tree canopy can degrade GPS accuracy to 10 meters. The heaviest tree canopy as well as "urban canyons" can prevent the calculation of any position at all.

How long does it take for the MobileMapper Beacon to lock on to a beacon correction signal?

If you use the MobileMapper Beacon Configuration Tool to tune the Beacon to a specific frequency or beacon station, it should take only a moment to lock onto the specified signal. If you do not know which station to tune to or if you know that you will move to an area where another station's signal will be stronger, it may be best for you to let the MobileMapper Beacon automatically select the strongest beacon signal. This is the factory default and one of the options of the Configuration Tool. If you simply turn on the Beacon without first tuning it, it will automatically search for the strongest beacon signal.

Depending on proximity and signal strength of the beacon station, it can take up to 20 minutes to lock onto the strongest signal the first time you use the Beacon. The next time you use it, it should not take more than a few seconds to lock onto the signal from the last station you used. If you move to an area where a different signal is stronger, the Beacon will automatically tune itself to the strongest signal.

Where can I find the MobileMapper Beacon configuration software?

The MobileMapper Beacon configuration software is available for free download from the Magellan Tech Support ftp site (<ftp:magellangps.com>) in the /Mobile Mapping/MM Beacon/Software/ folder. There are two versions: one runs on a PC with Windows 2000/XP and the other runs on Windows CE .NET devices such as the MobileMapper CE. To communicate with the MobileMapper Beacon, attach the serial data cable to the data port on the bottom of the receiver and to a serial port on your PC. If your PC does not have a serial port, you may attach a USB-to-serial adapter to the PC end of the Beacon's serial cable and insert this into one of your PC's USB ports. Magellan recommends the IOGEAR adaptor, product number GUC232A.

When I run the MobileMapper Beacon configuration software and select the option to tune by site, I try to input my country, but the software won't let me?

If the "Tune by Site" option is selected, a region must first be selected from the Region dropdown menu. You can then pick your country and after that, you can pick the specific beacon you want to tune the MobileMapper Beacon to.

While I was running the MobileMapper Beacon Configuration Tool, I launched another application and the configuration software disappeared without creating an icon on the Windows task bar. How do I reactivate the software?

The best way is to press ALT key and then simultaneously press the Tab key repeatedly to scroll through a list of all the applications currently running on your PC. When you see "MobileMapper Beacon Configuration" in the dialog box, release the keys and the configuration tool will reappear.

What can I do to speed up communication between the MobileMapper Pro and the MobileMapper Beacon?

The time it takes to get first lock depends mostly on the signal strength of the beacon signal. However, here are some tips to minimizing time to first lock.

- a. Turn on the Beacon as soon as you are outdoors (where beacon signals are strongest). For example, if you are driving to a work site, you can turn the Beacon on and place it on the passenger seat of the car. Unlike a GPS receiver the MobileMapper Beacon does not need line of sight to pick up a beacon signal.
- b. Position the MobileMapper Beacon at least 75 centimeters (30 inches) away from the MobileMapper Pro receiver.
- c. The internal antenna of the MobileMapper Beacon (directly underneath the flat section containing the on/off, beacon lock and Bluetooth lights) should be horizontal for best reception.
- d. If you know the station name or the frequency at which it broadcasts corrections, we recommend you use the MobileMapper Beacon Configuration Tool to tune the receiver manually. After you set the MobileMapper Beacon to a certain frequency or beacon DGPS station, it takes only a moment to lock onto the signal, assuming you are within range.

How do I know if the MobileMapper Pro is using the Beacon's DGPS corrections?

Press the **NAV** button repeatedly until you come to the Position screen. When the GPS receiver is stationary and using the DGPS corrections from the MobileMapper Beacon, the Position screen will say "DGPS Averaging" beneath the coordinates display.

The green signal light has come on but the MobileMapper Pro is not using the corrections. What should I do?

Did you make sure to set the Baud rate of the MobileMapper Pro receiver to that of the MobileMapper Beacon? The factory default for the Beacon is 4800. While this is the same as the default Baud rate of the MobileMapper Pro, when you download data to MobileMapper Office, the receiver's Baud rate is automatically set to 115,200 for faster communications. If you then attach the receiver to the Beacon, you must remember to reset the Baud rate to 4800. You can easily do this by pressing the MobileMapper Pro receiver's **MENU** button, selecting **Setup** and the **Baud Rate** option and then selecting 4800.

What happens to MobileMapper Pro accuracy if the Beacon loses signal lock or loses power?

If the Beacon loses lock on the reference station, it usually takes only a second or two to get it back. If it shuts down due to power loss or a loose cable, you have up to 90 seconds to load in new batteries or reconnect the cable before MobileMapper Pro will stop using the last corrections and return to autonomous mode. If you wish, you may pause the MobileMapper Pro's logging function at any time and so avoid recording any uncorrected positions until you once more receive differential corrections from the Beacon.

How long do batteries in the MobileMapper Beacon last?

Depending on the type of batteries you use and the temperature, the Beacon should operate for several hours on a set of batteries. But it helps to always keep a set of fresh batteries in the spare battery clip that came with the product. There is a pouch in the carrying case (underneath the operation lights) specially designed to carry extra batteries. Please note that batteries without enough charge to power the Beacon receiver might still have enough charge to light the Beacon's LEDs. If you suspect this to be the case, replace the batteries.

My MobileMapper Beacon doesn't stay locked onto signals from the ground stations. Should I upgrade the firmware?

You do not need to upgrade your firmware, but you should check the four-digit Date Code on the back of your Beacon receiver. If it begins with "05," you can get a free replacement by filling out the form at <http://pro.magellangps.com/en/support/rma.asp>.