Frequently Asked Questions (FAQ's) about Topcon's mmGPS Technology

What is mmGPS?
Topcon's mmGPS is laser enhanced GNSS (Global Navigation Satellite System). By combining the reliability and accuracy of laser technology with the omnipresence and convenience of GNSS 3D positioning, a more versatile and accurate positioning solution is achieved.

What kind of vertical accuracy can I expect with mmGPS?
GNSS receiver technology when used in RTK (real time kinematic) mode and used alone has accuracy specifications of ±0.1'. Accuracy is slightly better when conditions are optimal such as satellite geometry. By enhancing the vertical element of GNSS with laser technology; accuracy improves to as high as ±0.02'. The convergence of these technologies creates a solution that reaches more applications that require tighter vertical accuracies.

What are some of the applications for mmGPS?
Applications include fine grading, layout, paving (both asphalt and concrete), as well as curb & gutter and finish elevation staking. Realistically, any application that requires vertical accuracies currently measured with optical and robotic total stations or sonic trackers, can benefit from mmGPS.

Am I limited to using mmGPS for positioning only heavy equipment?

No. mmGPS is for both man and machine. There are two sensors available, the PZS-1 and the PZS-MC. The PZS-1 is a light weight laser sensor that mounts atop a rod and interfaces with a Topcon GNSS receiver.

The PZS-MC has a 360 degree window and is used for 3D machine control mounting atop a mast. The GNSS antenna is part of the PZS-MC and interfaces' with a Topcon GNSS machine control receiver.

Is mmGPS laser technology different from conventional flat plane lasers?

Yes. Conventional lasers emit a flat laser plane signal. The laser sensor at the rover end of the signal, be it man or machine, must be moved up or down to find the signal. The position of the sensor must be maintained in order to continue reading the signal from the laser transmitter.

LAZER ZONE

The mmGPS transmitter called the PZL-1, utilizes Topcon's unique Lazer Zone technology. The PZL-1 emits a patented 'fan beam' signal with a height of 10 meters (approx. 33 feet). As long as line of sight to the transmitter is maintained and either the PZS-1 or PZS-MC is within the 10 meter field of view, measurement is maintained. This is very productive because the sensor is always in the field of view.

What happens when I lose line of sight to the PZL-1 mmGPS transmitter?

If line of sight to the PZL-1 transmitter is blocked, mmGPS slowly transitions back to the GNSS vertical solution. As soon as the PZL-1 transmitter is visible again, mmGPS reverts back to the more accurate laser augmented vertical solution. You are never without a vertical solution, ranging from ±0.02′ to ±0.10′ in accuracy.

Why is mmGPS technology a better investment over robotic total station control for man and machine rovers?

Currently, high vertical positioning is controlled by an optical total station or robotic total station. While this technology does work well, the total station can control only one rover at a time. mmGPS utilizes a patented rotating fan laser and can control an unlimited number of rovers, man or machine. mmGPS is also about half the cost of a robotic total station.

What is the maximum working area, both vertical and horizontal for a mmGPS system?

One PZL-1 transmitter will cover 10 meters (approx. 33 feet) vertically and 600 meters (approx. 1968 feet) horizontally. Up to four PZL-1 transmitters and be linked together increasing the vertical working area to 133′ or 7880′ horizontally. The rovers dynamically move from one transmitter to the next seamlessly.

Once I install a machine with mmGPS, can I move the sensor to other machines as needed?

Yes. Because of the component design, the PZS-MC sensor can be moved to other mmGPS enabled machines to satisfy all high accuracy applications.

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