Hemisphere®



THE EVOLUTION OF GNSS TECHNOLOGY

IN THE MACHINE CONTROL WORLD

HGNSS.COM
GRADEMETRIX.COM

THE EVOLUTION OF GNSS TECHNOLOGY IN THE **MACHINE CONTROL WORLD**

A growing population, soaring urbanization, and booming economic growth are leading to an unprecedented expansion within the construction industry. Demand for efficient and quick development in construction, mining, and other industries is driving the need for companies to improve efficiency. Delays and cost overruns are major challenges in infrastructure and construction projects. Many governing agencies are now making on-time and on-budget completion of projects mandatory and imposing large fines if projects are late.

Have you ever been required to stop your work because a dozer knocked over a survey stake? Are there times when you had to stop excavating to wait for someone to check grade? As the demand for efficiency increases, we are all looking for ways to improve and enhance our operations.

The Machine Control System Market is estimated to grow at a CAGR of 8.6% over the next four years. Machine Control systems often use total stations, lasers, or GNSS systems. The largest segment of this market is forecasted to be GNSS receivers. As technological advances reduce complexity and drive costs down, the adoption rate of GNSS in the construction industry is expected to grow.

While it has been known for over twenty years that GNSS technology can greatly improve the efficiency of a job site, what have been the reasons that have prevented you from adopting machine control? Many people will cite cost as a barrier to entry. Traditional machine control systems add tens of thousands of dollars to a machine.

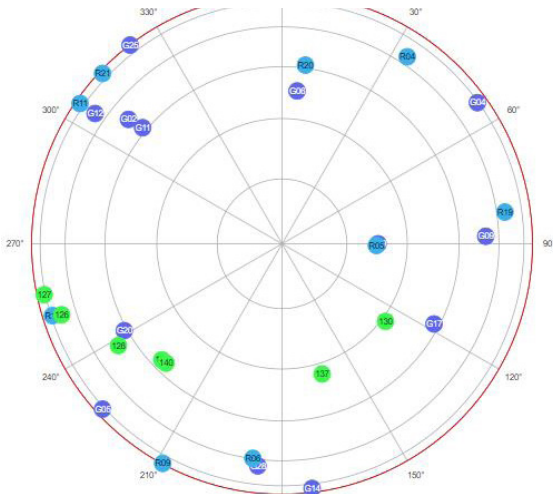


Many will also mention complexity. Seeing the abundance of cables and sensors required for making a machine control system work is intimidating, especially when you may not have the personnel to service the equipment. Traditional machine control systems often include a control box, a GNSS receiver, two external antennas, multiple cables, and a radio for RTK. The two antennas for the GNSS receivers need to be mounted onto the machine, and in the case of an excavator, this is often done by welding masts onto the counterweight – limiting the type of machines to which you could install systems. You might ask, "Will I be able to service all these cables?" and "If the machine goes in for service and we must remove cables, will we be able to put them back?"

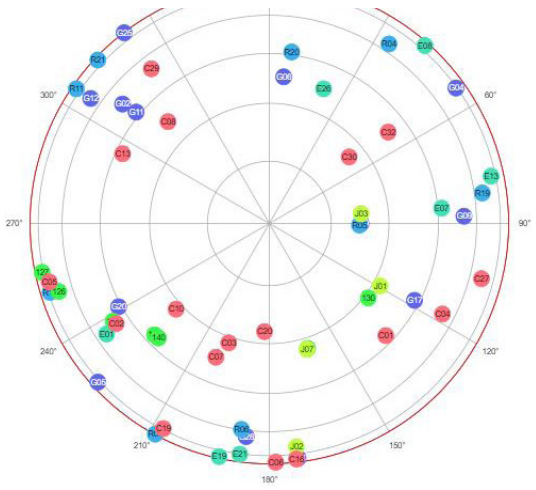
Some people may cite the technological limitations of GNSS, "Doesn't GNSS need a clear view of the sky?" or "I often work in heavy canopy of near buildings. Will I have coverage throughout my jobsite?" Difficult working environments as shown in the image below have always posed a challenge to GNSS since a clear view of the sky is necessary for calculating an accurate position.

The longstanding issue of performance near buildings or under trees is reduced with the addition of new GNSS constellations. While GNSS still requires a view of the sky, the addition of satellite constellations means that there is a greater likelihood of viewing enough satellites in tougher environments. Improvements to multipath detection and mitigation have also increased the probability of maintaining the accuracy required for an RTK Fix. While older receivers could only use GPS, or perhaps GPS + GLONASS, modern GNSS receivers can now track and use GPS, GLONASS, Galileo, BeiDou, and QZSS – increasing the chances of maintaining an accurate GNSS solution in the most severe environments.

Hemisphere GNSS' VR500 is an all-in-one dual antenna Smart Antenna. The VR500 comes standard with all constellations including GPS, GLONASS, Galileo, BeiDou, and QZSS. The VR500 can track and use all available satellites and signals in the sky. The VR500 has two internal GNSS antennas for position and heading, an internal RTK radio, and a single connector that has both power and communication to reduce the complexity of the installation and improve the serviceability of the system. The VR500 system is the quickest and easiest system to install that is currently on the market and has fewer cables and points-of-failure than any other system. Additionally, the system is mast-less – meaning that you do not have to weld masts to the blade or counterweight of your machine. This increases the variety of machines to which you can install and use the system.



GPS + GLONASS



All Constellations



GradeMetrix is a simple to use machine control software application. GradeMetrix is carefully designed based on years of experience so that the core features most operators need and use are included. GradeMetrix contains the features that customers use most often, and the streamlined user interface makes it easy to use.

Hemisphere GNSS' VR500 with GradeMetrix is the ultimate solution to long-standing issues plaguing the machine control industry. The VR500, with an attractive price, has reduced cost and complexity. The small profile allows the VR500 to be installed onto compact excavators and other machines that have previously been excluded from machine control systems. Be sure to visit www.GradeMetrix.com to see webinars, brochures, or to contact Hemisphere GNSS to learn more.



Hemisphere®

HGNSS.COM

8515 E. ANDERSON DRIVE
SCOTTSDALE, AZ 85255
480-348-6380