
A New Approach to Final Trim

Topcon's mmGPS at work around the country

The Topcon 3D Millimetre GPS (mmGPS) system has been winning praise on a number of major jobs around the country.

This system is unique, employing principles not available from others. A strong point is its lower cost compared to alternatives. Another is the high accuracy of results being obtained in the field.

Taking a broad view, today's conventional technology calls for GNSS (the new name for GPS) for bulk work, and a switch to total

station (laser) control for final trim. This involves setting up the total station, a task for a surveyor, and replacing GNSS antennae with laser reflectors, both consuming time and requiring expertise.

Mike Wells, a motor grader owner/operator on the Pakenham Bypass in Victoria (where six Topcon grader systems are operating), explains the benefits:

"Working under GNSS guidance, I can approach my Topcon LazerZone transmitter and as soon as I come within range—about 300 metres—I'm immediately alerted that laser accuracy is available. That is, the vertical accuracy of my blade position has improved from 20-30mm to about 8-12mm. There's no need to stop the machine, exchange a laser reflector for a GPS antenna, or anything like that—the transition is automatic."

Thus, Topcon's mmGPS system is the first to offer a seamless convergence of GNSS efficiency with laser accuracy.

A Lighthouse Beam

The Topcon technology centres around its LazerZone transmitter, which bears no similarity at all to a conventional laser transmitter. It's best visualised as a 360 degree lighthouse beam that bathes the operating area with a ten-metre-high beam of invisible laser light. The signals are encoded, enabling the receiving equipment on the machine or survey



Topcon's unique LazerZone transmitter (below) is quite different to conventional lasers or total stations, bathing a 300-metre radius with encoded beams picked up by a special receiver on the machine, or survey rover (at right). It can service numerous machines/rovers at any one time.

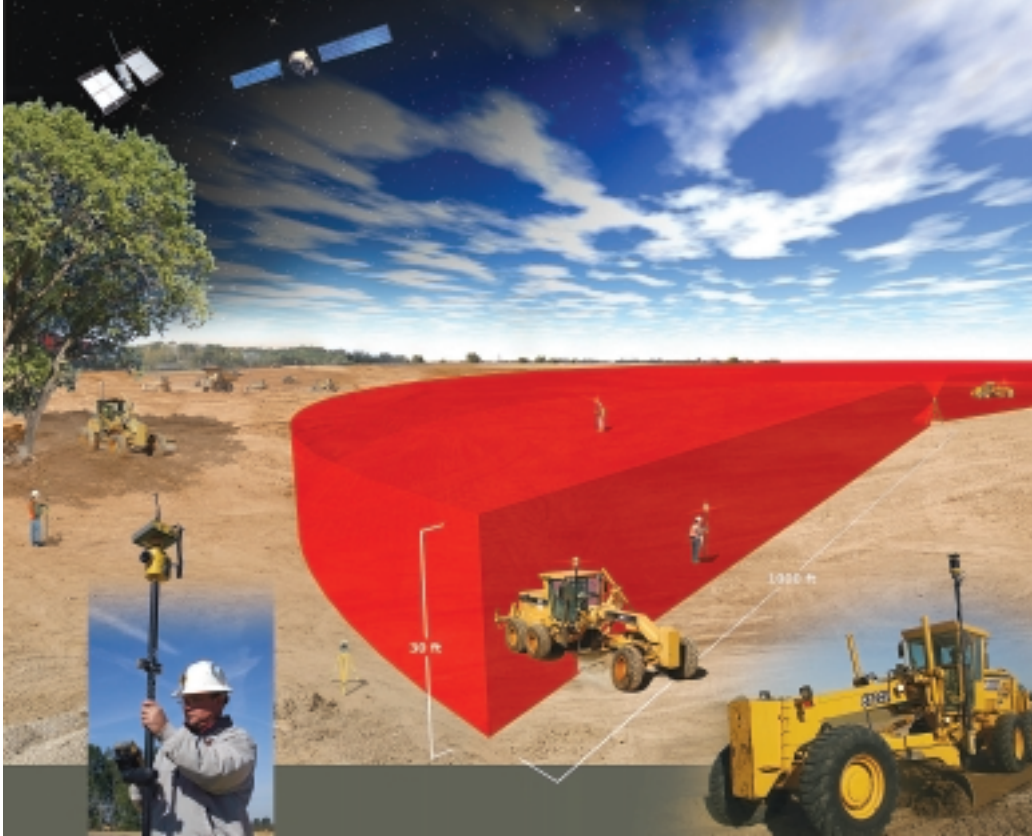


rover to interpret its distance and elevation above or below the source—in other words, to fix its location in both the horizontal and vertical axes with high precision.

This Topcon approach eliminates the need for the laser reflector to be mounted on a moveable mast, with its attendant mechanical complications. In practice, the GNSS antenna is installed directly on top of the laser receiver. The machine-mounted system can identify which LazerZone transmitter it's talking to, if there's more than one on a site.

The operational diameter of the zone can be 600 metres plus, but is commonly something better than four hundred metres. Unlike a total station, one LazerZone transmitter can service a number of machines and rover-equipped surveyors at once.


Mike Wells tells us that moving the LazerZone transmitter on site when he changes his area of operations, is simplicity itself. "I do it myself, often six times a day, and it takes five



minutes. Just erect the tripod over the next control point, line up a vertical red laser beam with the spot on the peg, and the LazerZone unit self-levels. Job done.”

In particular circumstances, project supervisors may judge that there's a productivity gain to be

obtained by extending a grader's trimming range and keeping it on the move. Topcon's mmGPS system offers this, by permitting a number of LazerZone transmitters to be lined up in a row, so that a machine can 'drive through' one to the next, a total distance of over two kilometres.

about \$15,000 on the machine itself and \$15,000 for a LazerZone transmitter. It's backward-compatible with Topcon systems 4 and 4+. So you're up and running for well under the price of a conventional total station, and the LazerZone will do the job of a dozen of them. 

More Affordable

Bob Bent, Topcon's Victorian dealer, tells us that a grader operator already equipped with Topcon GPS can upgrade to mmGPS at a cost of




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