

Machine control at Conexpo



New Tracking Sensor for Cat AccuGrade ATS

Cat's new MT900C active machine target for AccuGrade ATS systems broadens support for AccuGrade ATS on motor graders and dozers. The operator can conduct real-time fine grading operations with increased accuracy without fear of losing instrument lock.

The target uses a 360° ring of infrared LEDs to allow reliable tracking from any horizontal direction. The infrared LED's emit one of 16 programmable IDs that allow the instrument to lock-on and track the correct target. That is, on a site with a number of machines at work, this target ensures that its partner ATS is tracking the correct machine without getting confused—and maintains a solid lock when machines cross each others' paths.

The MT900C operates in a wide range of temperatures (-40°C to +80°C) to keep operators in the cab going even when conditions turn severe.

AccuGrade for backhoes

Cat is the first manufacturer to have introduced machine control as a built-in option, tailored for backhoe loaders. There are two versions—'site reference', a simple system taking its fix from a known position, and a more refined version, 'laser reference', whose name explains the difference.

Topcon: speed increased by TEN times!

We'd seen a levelling off in machine control performance over the past two or three years, but Topcon has raised the bar several notches higher with the release of its new 3D-MC2, strongly featured at Conexpo 2008 by way of dozer simulators.

"Fine grading with a dozer is typically done in first gear. You're trained to go at a slow rate. You go too fast, and the ground looks like a wave pool. But having access to a system that allows you to grade faster, and at the same time achieve maximum smoothness is a major plus for contractors," says Murray Lodge of Topcon USA, explaining that the new system can increase dozer grading speed by up to two hundred percent.

As Topcon points out, it's a 'no brainer' that dramatically increasing the operating speed of a machine—by allowing a dozer to consistently operate in third gear rather than first, for instance—will get the job done quicker, save fuel, and reduce wear and tear.

This is achieved in the new 3D-MC2 by the bringing-together of various improved technologies. Topcon points to better satellite signal filters, the introduction of an inertial sensor to 'anticipate' the execution of grades, and refined algorithms (the arithmetic that drives the system). Fast processing of data, to be effective in practice, calls for highly responsive valves, so presumably in the 3D-MC2 product we're seeing the benefits of Topcon's collaboration with Sauer Danfoss, the hydraulics experts.

Ray O'Connor, president of Topcon, enthuses that "there's never been anything like this in construction machine automation. Topcon's new 3D-MC2 technology speeds up the position calculation by a factor of *ten*, compared with today's systems.

"This allows for faster blade positioning in real time, which means the machine can be controlled to design grade at much faster speeds than any other system."

It'll be interesting to see this product at work in the field, but certainly the concept of an inertial sensor in a dozer system appears to have great merit. Whereas a motor grader has a couple of wheels way out front of the blade to stabilise its forward motion, a dozer is virtually hanging off its own blade. In principle, an inertial sensor should iron out a lot of wrinkles—the 'waves' referred to by Murray Lodge.

Trimble's 'Connected Community'

Trimble's focus at Conexpo 2008 was on what it calls the Connected Community, a many-faceted system of sharing information and transferring data both on a construction site, and with the office.

In both indoor and outdoor settings, demonstrations featured typical workflows on a job site by showing how two-way data transfer and real-time communications increase productivity for site positioning, grade control, asset management—and permit a variety of team members to access what's of importance to their particular roles.

The areas covered by Trimble demonstrations were:

- an intelligent "live" link between each machine on a site, and the office. Up-to-date design information is sent to the cab. Two-way data also allows the equipment manager to monitor the location and activity of each machine and to retrieve 'as graded' and compaction data from individual machines to monitor site production volumes and compaction performance.
- the Trimble 'Construction Manager' solution, a general management tool that combines GNSS and wireless communications so contractors can 'connect' to their assets. Using an Internet interface, the contractor can see the status of each piece of equipment on their construction sites—live in the office. He can monitor and report cycle times, equipment productivity and utilisation, machine run time and idle-time hours.

Machine control at Conexpo (cont'd)

The Trimble software running the 'Connected Community' is extremely flexible, and can be configured to allow not only project managers, but also—for instance—owners of projects, engineers, and consultants to keep track of progress.

Hexagon pulls the threads together

You'll have read in our earlier issues that the Swedish multi-national Hexagon has rapidly put together a large stable of important players in the machine control and survey fields, whose products are well known in this country—Leica Geosystems, Mikrofyn, SBG (the Georog people) and numerous others. What hasn't been very clear so far—no doubt because it's not a quick process to digest such a varied group—is what roles these acquired companies will play in the Hexagon plans; who will lead the way in developing new products; how they'll be marketed; and generally how things will move forward.

A range of second-generation products was revealed by Hexagon at Conexpo in March, labelled *Power Digger* and *Power 2D/3D*. These products will come to the market this May, or soon thereafter.

An excellent feature was a docking station using infra-red communication. These new products are far more portable and self-contained than their predecessors. Everything needed for guidance is on the display itself—no external light bars, or things like that—and the display contains the entire nerve centre of the system. When you unclip it from the docking station and take it home after a day's work, all that's left in your machine is the wiring.

Both 2D and 3D versions are offered (3D is more expensive, of course) but they're interchangeable and both clip onto the same docking infrastructure in the machine's cab. The 'intelligent' dock communicates with the display by infrared, and significantly, stores all the settings and calibrations for that particular

machine. This is a considerable advance on earlier units, where 2D and 3D units could certainly be moved from one machine in a fleet to another, but they required calibration for the machine they were going in to.

There's a lot more to it than that—obviously—but we'll go into the fine print a bit closer to the launch date.

We spoke to Julian Grant, marketing manager of Hexagon Machine Control, based in the UK.

Julian emphasised that these new products are the fruit of very close collaboration between the different companies in the group—he believes that Hexagon has established excellent teamwork. This consolidation by Hexagon foreshadows more effective competition with the other majors—Trimble, Topcon, and Caterpillar.

We'll be interviewing Mark Concannon, president of Hexagon's Machine Control Division, for our upcoming issue in May.

Sandvik brings 3-boom development drilling to Australia

Sandvik has launched its new three-boom DD530 development/construction drill on the Australian market. Designed for use in rapid decline development in hard-rock mining, as well as in civil construction tunnelling operations, and suitable for drilling cross sections of 12—75 sq m, it is Sandvik's first new generation three-boom jumbo in Australia.

According to Peter Bates, Sandvik's product line manager for underground drills, the DD530 represents a substantial advance in hard-rock tunnelling productivity. "Its combination of our TCAD system, which ensures very accurate drilling precisely as per planners' design specifications, with the three booms, which give up to 50% higher production than two-boom jumbos, make it a highly productive, accurate drill rig.

"Our TCAD system, which has been regarded as proven technology in Europe for several years now, but which has only gained acceptance in Australia in the past couple of years, is a major contributor to increased productivity and drilling accuracy on Sandvik drills," he says.

This system means the tunnel planners can provide their computer-designed optimum drill patterns to the operator on a USB memory stick. This is plugged into the TCAD, and indicates to the operator precisely where to drill via an in-cab on-screen display. "This means far more accurate drilling—typically to within 200 mm for mining tunnels and within 100 mm for civil applications—and there's no need to mark up the drilling points on the rock face, substantially speeding up productivity," says Bates. □

