



Complete, modular solution for excavators

The best in site automation

Topcon offers a complete range of solutions for excavators, from entry level indication to complete GPS+ receiver positioning. Topcon is proud to present its complete portfolio of grade reference instruments allowing operators to grade faster while keeping full control of the machine. The benefits for users of Topcon's total solutions are clear; eliminating over-excavation, minimizing material waste and increasing profits.

Top of the excavator system line is Topcon's 3DXi. This innovative solution has a sturdy design and is made for outdoor job conditions. Four new temperature compensated 360-degree CAN-based tilt sensors measure angles from cab, boom, stick, and bucket, creating a precise cut every time. GPS+ technology ensures maximum productivity with access to both GPS and GLONASS satellites.

Immediate return on investment

The 3DXi is easy to install and set-up. But most of all it's easy to operate. In deep, blind cuts, under water, digging ponds or canals, or following the most complex design, this technology will pay dividends from the first day of operation. With 3DXi there is no over-excavation, so contractors can save on materials, time and money on every job. 3DXi even provides the ability to set up to six



site and the bucket's cutting edge simultaneously. Operators can use the display not only to position their machine over a utility center line, but for steering indication as well. The 3DXi eliminates the need for a grade checker to constantly monitor excavation depth. Even multiple views can be used when more detailed information is required including plan, profile

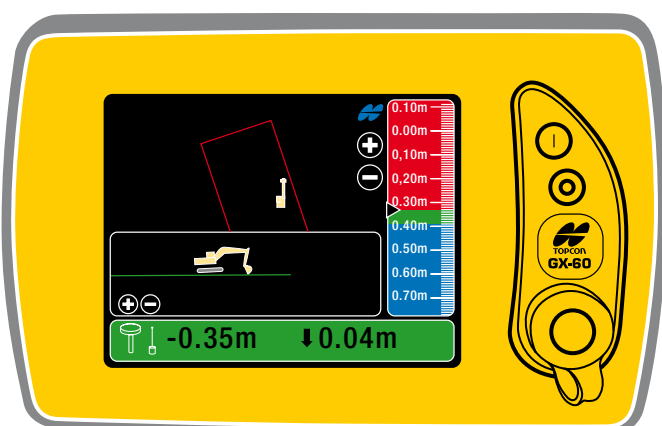
and the LS-B10W laser receiver which can be added in the CAN Bus configuration.

In addition, Topcon offers entry level solution, the 2DXe. With



the 2DXe Topcon offers the usual level of reliability clients expect of Topcon products at a more economical price.

This light weight system consists of tilt sensors, the GX-40 graphical display and detachable light bar for indication. Unlike its bigger brother, the GX-40 does not consist of a touch screen, but offers a similar level of functionality using key pad buttons.

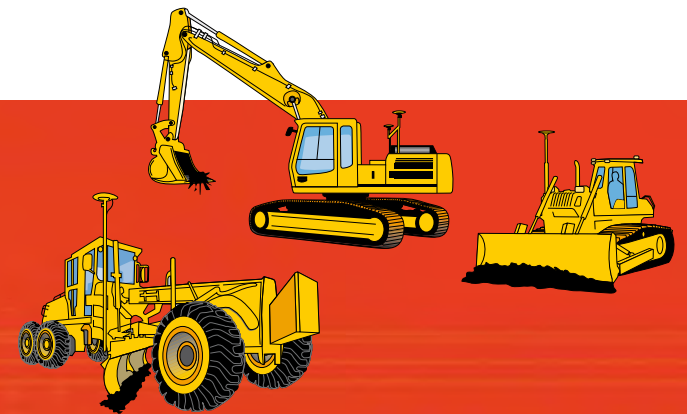


different bucket sizes, to change buckets during the job. The tilting bucket sensor option offers operators complete control over every aspect of the grading.

The GX-60 acts as an in-cab display, allowing the user to „see“ the machine's exact position on the

and sectional and dual grade indications.

Next level in the range is the 2DXi. Topcon offers the 2DXi laser solution as a basic system, ready for GPS+. The easy to use 2DXi system includes standard tilt sensors, the GX-60 graphical display



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It's time.



GPS + GLONASS + GALILEO

World's first!

Ultra-visible GreenBeam®

It's time for the **RL-VH4G** interior laser that's right for all your jobs.

Unmatched horizontal and vertical layout establishing level across an area, large or small, is easy with the RL-VH4G.

The GreenBeam® quadruples beam brightness so you never lose the beam, even in direct sunlight!



Vertical set-ups are a snap. Set up over layout points, turn it on, and the laser's rotation transfers these points to any vertical surface on the job to position studs, drop walls, or bulkheads.

Speed the pace of any 90° layout or alignment job, quickly establishing corners and tee's.

- super-bright GreenBeam®
- LS-70G laser sensor



The new GR-3!

Topcon is proud to be the world leader in advanced satellite positioning technology. From our leadership with dual constellation, GPS+GLONASS receivers, springs the next generation of satellite positioning technology – G3.

G3 is the first technology to combine all three satellite positioning systems – GPS, GLONASS, and the European Galileo system.

In addition to adding the Galileo system to Topcon's industry leading GPS+GLONASS technology, the new G3 chip technology incorporates all the planned signal

modernization of the GPS and GLONASS satellite systems, representing a system that is designed to track all available positioning satellite signals, available now or planned for the future!

Just imagine combining all the power of the new G3 tracking technology in a small, rugged field



Advanced System Design

- Hot-Swappable Batteries
- Li-ION Rechargeable or Alkaline
- Completely Cable-Free Design
- Convenient Quick-Snap pole mounting system



Memory & Communication

- Easy Access SD & SIM Cards
- Spread Spectrum or UHF Radio
- Internal GSM/GPRS
- Bluetooth Wireless Technology



Ultra Rugged Construction

- Durable magnesium housing
- I-Beam construction
- Withstands 2(m) pole drop onto concrete
- Environmentally sealed external ports

receiver. The new Topcon GR-3 receiver represents the next generation of advanced system design and tracking technology from Topcon, and truly sets new standards of performance, accuracy, and innovative receiver design.

In addition to using the new G3 satellite tracking technology, the new GR-3 receiver also incorporates a unique dual communication system, featuring both cellular and radio technology.

Topcon's GR-3 with its Universal Signal Tracking and a wide array of advanced design features is truly a revolutionary receiver, two

steps ahead of any other receiver technology available!



GPT 9000 MC - Modular solutions for every job

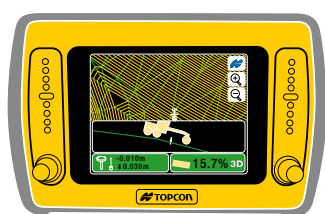
New total station based 3D control system

With the recent introduction of its GPT-9000 series, Topcon offers the most advanced robotic survey tool available. The high speed motors provide extremely fast and accurate tracking with the compact unit. Integrated long life batteries and compact design make the system easy to transport and handle and its unique Windows CE based operating system is easy to use. With 2000 meters prismless measurement range, the GPT-9000MC by far has the longest and best prismless range in the market.

To complement the range, the GPT-9000A survey tool is now available for 3D Machine Control applications. With all the same successful and field proven characteristics and an impressive 20Hz update rate, the GPT-9000MC is an ideal fit for 3 Dimensional Machine Control, or any demanding survey task!



With the introduction of this new product, Topcon offers the widest range of 3D solutions on the market, ranging from its 3D GPS+ control, to Millimeter GPS and now



Total Station control, a Topcon system ideal for applications in challenging environments where a clear view to the sky is not available.

Not only does Topcon offer the widest range of solutions for MC applications, all 3D control systems are completely modular and upgradeable. Use your machine control system for 2D sonic or laser control, switch to 3D GPS or MMGPS control by connecting the GPS antenna, or switch to 3D Total Station control within just minutes! All from the same control box.



From 2D sonic to 3D Control

Revolutionary new paving solutions

With the invention of the Sonic Tracker™, Topcon set the standard for elevation control in road construction more than a decade ago. Today, Topcon is proud to introduce the next step in construction automation, with a truly innovative line up of solutions designed for the ultimate in paver and profiler control!

ready ---pave®

Economic entry level solution for any make of machine. Easy and quick to install, easy and accurate to operate, using the handset with display and innovative dual sensor ultrasonic.

Readypave™ features low mounting elevations upto 35 cm, as well as very accurate vertical temperature compensation in a durable and ergonomic design.



display

sonic sensor



master ---pave®

The ultimate, modular concept for combining all possible sensors, including revolutionary Quatro™ ultrasonics, Laserscanning, Sonic averaging, slope and even 3DMC. Choose whatever sensor fits your application; the CANBUS and RS485 technology allow for easy installation on any make of machine, as well as quick and easy exchange of components.

Quatro™ Sonic Sensor

With the new Quatro™ sensor, Topcon offers the best in sonic elevation control, extreme flexibility in mounting height, and highest possible accuracy because of advanced temperature compensation and overlapping multiple sonic cones.

Laserscanning

Topcon's Laserscanner offers all functionality of mechanical skis, without the physical headaches and issues associated. Easily set the desired length of measurement for ultimate smoothness and averaging capability.



quatro sensor

scanner



control box



auto ---pave®

The ultimate in accurate paving and profiling; the high precision Topcon mmGPS™ system. String-and stake less paving now made possible by GPS+, with the accuracy of a traditional total station.

A modular, upgradeable solution using a single mmGPS™ receiver in combination with Sonic or Slope, or Dual mmGPS™ receivers. Easy to adapt to any application or site requirements. Only from Topcon.



3DXi control box



GPS antenna with mmGP receiver



The first French company to use millimeter GPS

Millimeter measurement with GPS of French A63

In Bayonne in the South of France, Mr. Lionel Sores of Ecartip and his colleagues measure the A63. „The road owner, Autoroutes du Sud de La France (ASF) will change the A63 from two to three lanes. We measure the state of this road and its paving. This tasking job, that mostly takes place at night, is done much faster thanks to Topcon's Millimeter GPS”, Sores explains.

„The A63 is one of the main roads in France and an important route for both tourist traffic and commercial traffic to and from Spain. It is also important for moving cargo from Africa and Morocco to the rest of Europe. Per hour 2000 trucks pass through here.”

Measure the slope

„Every five meters we measure two points of the road. One is on

the inside near the soft shoulder. And one is on the outside very near to the passing traffic. Every 400 to 500 meters there is a base station generating information and sending this to the field computers of the surveyors.

We measure the slope and see if this has changed. We check the paving materials and make a 3D model of this. When the slope of the road has changed a lot, it could

eventually cause the breaking of the asphalt.”

Saving time

„Using Topcon's Millimeter GPS saves money and time. It is cheaper than most other options. In the old days we scanned an entire road using laser. This was almost impossible, because with most stations you can only scan 150 meters per time. With mmGPS

we can measure very quickly, very easy and get good results. The mmGPS gives us a lot more precision. We can now model the

entire road without many problems. We measured 20 km in 12 nights with just five men.”



Connect your

Topcon offers a glimpse at the jobsite of the near future. A jobsite where communication is the keyword. Where information from all machines and people is centrally stored and accessible for all that are working on site, and where updates are provided and shared in real-time. Instant communication at the touch of a button. And where cost-efficiency is not just a buzz word, but reality.

All signals, all machines

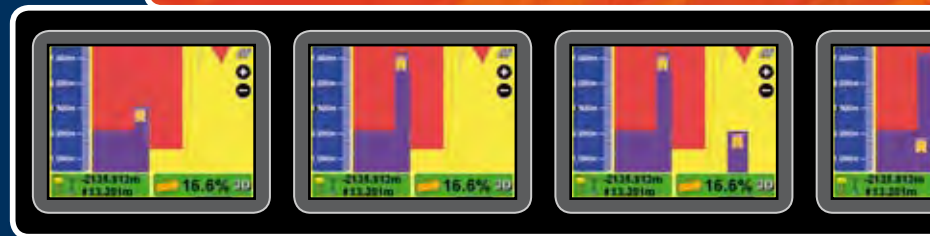
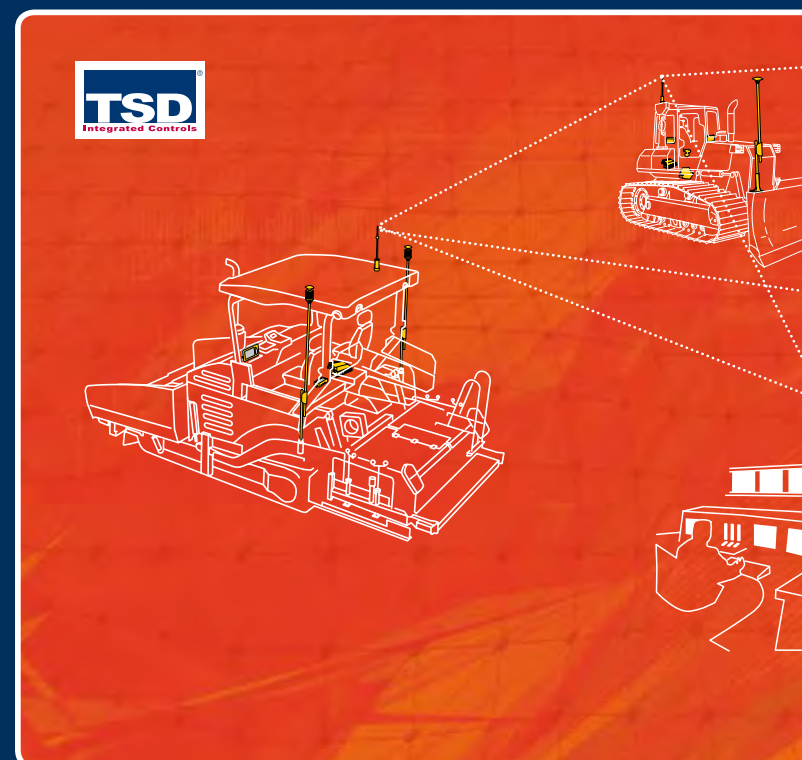
With the introduction of SiteLink™, Topcon expands its highly advanced products and technologies to bring communications and data network availability to jobsites around the globe. But it's not just connecting your site, SiteLink™ connects the world!

Due to its unique wireless mesh networking solution, the range and number of users are virtually unlimited, allowing you real-time access and control over all machines, all progress and all communications on all your sites!

A vast range of possibilities

For each machine or operational unit, different sets of specific information can be programmed and continuously provided to a central database. This can range from operating hours to oil pressure, from position info to real-time cut and fill mapping.

All this info can then be shared with operators or other machines, allowing real-time updates on 'as-builts', proximity information and general machine management



Topcon and Komatsu Alliance – Machine Control standard on all excavators and bulldozers

Komatsu Europe and Topcon Europe join forces



The worldwide corporation between Komatsu Ltd. and Topcon Ltd., both from Japan, is translated into an effective relationship in the European market. This alliance offers the customer the best of both worlds. With this new alliance Topcon's automated Machine Control system will become a factory installed, standard equipment option on Komatsu excavators and bulldozers. The agreement covers the European Komatsu and Topcon distribution network for three-dimensional (GPS- and LPS-based) and two-dimensional (laser- and sonic-based) machine control systems manufactured by Topcon.

Market leaders

Both companies are at the top of their respective fields and decided to share their overlapping expertise in the benefit of their customers. Each of the partners

will focus on its own markets, but will share specialist knowledge to enhance the productivity of its end users. The use of innovative techniques must assure and strengthen the positions of both market leaders.

Productivity opportunities

Komatsu's decision to align with Topcon was based on two primary factors. „One being Topcon's technological advantages and its respected position and experience





tools. In addition the system provides direct text messaging or communication from machine to machine, and even can serve as a differential position corrector (GPS corrections).

Communication capabilities

In addition to processing power, the new SiteLink™ controller basically offers unlimited communication capabilities via radio mesh networking and by providing Wireless communication such as Wi-Fi, USB, Ethernet and cell phone connections.

Where it all comes together

Combine all information across the line for up to date information on the progress of a project. Share it throughout the process, connect all your assets. From the very beginning of a project to its finish, over multiple jobsites, you will be on top of all machines and their results.

- All machine builds
- All machine data, all job data, all production data
- Communication to and from machines to central control, to and from surveyors to central control, from machines to machines
- Fleet management and productivity combined
- Productivity reporting with machine data



in the worldwide machine control market and secondly Topcon's position as the only manufacturer that has the ability to receive all signals from all available satellites, added valuable productivity opportunities that GPS-only system cannot match", Komatsu Ltd states.

In-field support included

Topcon and Komatsu will share information to assure that the Topcon control platform and specified Komatsu machinery will maintain complete compatibility at a

core technology level. Both installation and operation of Topcon's productive control systems will be seamless. All 'machine-mounted' components of the Topcon systems can be ordered directly from Komatsu, arriving at the Komatsu distributor pre-installed and ready to use.

The 'non machine-mounted' components (GPS base stations, robotic control instruments, laser transmitters, etc.) still will be sold through the Topcon distributor network. In-field support can

be provided by Komatsu or any authorized Topcon distributor. Each of the companies will offer repair services manned by employees with the best know-how for their respective field.

More efficiency

Topcon and Komatsu both recognize this agreement as a key opportunity to provide more efficient utilization of earthmoving equipment all over the world, helping to ease the demands on existing infrastructure by providing faster

construction methods, with less disruption of resources, and lower financial and social stress on local populations.



When good gets greater: 2,000 m range!

At Topcon Europe Positioning we constantly strive to better our products. Looking for ways to improve, enhance or even slim down our innovative instruments to more perfectly meet construction job site needs. Through the years this has resulted in some major improvements. Now the GPT-7000 series Total Stations has gone from good to great with the new GPT-7500. It offers 2000 meters Non Prism Long mode measurement, whilst being almost 10 percent smaller in size.



Slim, lighter High Performance

The most important improvement is in the range of the Total Station. The GPT-7500 has a range of 2000 meters LNP; that is 800

meters more than its predecessor the GPT-7000. Although we realize that 2000 meters are not the standard requirement in day-to-day work, 2000 meters reflectorless means that virtually any surface (black or dark, thin lines or poles

LONG RANGE TECHNOLOGY

and even asphalt) can be measured at practical distances up to 350 to 400 meters.

No other manufacturer will give you this range on difficult surfaces!



Lean and mean

Besides this we have streamlined the system and have come up with a lean mean total station. Being almost 10 percent smaller means easier to handle and transport, so

less bulk to carry around. But we didn't make the keyboard smaller; it is very easy to use and offers large size keys with backlight. This ensures that you can keep on working no matter the circumstances or the weather.

With its multiple interface including CF-card, USB port and mini USB port it is easier than ever to take your job on the road. And as it is based on a Windows CE operating system, your field-office communication is instantaneous!



Quick and precise determining of quantities with GPS+ equipment



The Te Kloeze Bruyl earth moving company is an independent medium sized company and it is made up of several independent enterprises. The activities are controlled from Terborg in the east of The Netherlands close to the German border. Since its foundation in 1993, the company has seen steady growth, which came about through a variety of projects in the area of foundations, path construction and hydraulic engineering. With its current staff level of 46, the company mainly carries out projects for large contractors in The Netherlands and Germany on a subcontracted basis.

Director-owner Alberto Bruyl: "Growth has been good from the start and we are able to carry out more and increasingly large projects for our customers.

The company has made a considerable investment in recent years in expert staff and advanced equipment. This means we are able to provide a service at keen prices.

Modern engineering plays an important role, even before real work has begun. I'll give you an example. When tendering for a project we use professional GPS+ equipment, which can very quickly and precisely determine how many cubic metres need to be moved. This means we can estimate precisely how many man hours a job requires and what material is needed."

Alberto continues: "Te Kloeze Bruyl carries out wet and dry projects. At present we are extremely busy with the construction of the A37, the current N73 on the stretch from Emmen in the direction of Germany.

Without our precise GPS+ equipment, the setting out work over such a long stretch would take up too much time. GPS+ equipment is essential for wet projects too. Te Kloeze Bruyl was recently successful in getting the job of digging

out a hole in a dam wall underwater for the purpose of constructing a

settling tank. This was a tough job because several piles had been

driven into the excavation area. With the help of the Topcon 3DXi, a GPS+ Machine Control system on the crane we were able to dig around them very precisely. This would have been almost impossible without the precise position fixing which GPS+ gives us.



Leveling HSV AOL Arena - Topcon 2D MC System

Laying a new playing surface at the AOL Arena



The inside of the AOL Arena has recently been dominated by tractors instead of players. On Friday, 3 November 2006 the football field where local Bundesliga football team HSV (Hamburger SV) plays, was renewed. This order was given to the Hamburg construction company Schlatermund. Within three days the old pitch was taken out, planed and replaced with a new one.



Within four hours the entire surface was planed with a kilver from the Dutch company AP. It has a work width of 2.5 meters and an auto-

matic dual laser steering system with Topcon Europe Positioning laserreceivers LS-B2. The surface for the playing field was produced by a dual slope laser RL-H2Sa of TOPCON. The simplicity and the high efficiency of the devices convinced all those present. The client and the implementing enterprises were very content with the subgrade level results with accuracies of ±3mm. On Saturday the new lawn could be shifted in time. „So that the troops of head coach Thomas Doll once again have perfect playing conditions and will be more successful.“

SKS BAU - Topcon 3D machine control system

10.000 m³ moved



For the production of the 3.1 kilometer, two-lane circle road L6740 Neunburg vorm Wald, in Germany the five men strong work crew of SKS from Tuttlingen only needed 30 workdays. All together around 10.000 cubic meters of earth were moved and almost 8.200 cubic meters crushed stone were added.

For the surveying department this only meant development of a GPS Reference station and that the normal data that was used in the total station, was ready to be read into the 3D Machine Control for the machine.

rainy or foggy. Handicaps as rotation lasers that do not work well through vibrations of the machine, machines that drive through the sightlines or that leave the working area of 300 meters now belong to history. Likewise there is no more



Centimeter positioning

“Just turn the ignition key and go”, is the motto of the operators, working without interruption caused by measurements and changes in plans. The machine has already been positioned in the entire job site in height and depth to the centimeter level, whether it is windy,

set up and breaking down of the rotation laser or total station and the downtimes that this causes, are gone.

Correct after first passage

The operator in Topcon's 3DMC immediately sees where he is on the job site. By driving in auto-



matic mode the blade is steered in height and slope with accuracies of centimeter level. Checking of the final height is no longer needed as the result is correct after the first passage!



Positioning service for machine control - ascos

Economic satellite correction data for the job site

Construction machines such as graders, excavators or bulldozers can be navigated directly via satellite with the highest precision. Making an own reference station obsolete. Topcon and service provider ascos together developed a new modem-based solution for 3D-Machine Control on the building site. Our integrated and migrationable solution illustrates all processes from start to finish.

Basis of this complete solution is an industry-specific mix of the successful correction data and services, which ascos offers for satellite-based processes. With the precise real-time service (as-



cos PED) for example the machine can be steered with a deviation of maximum 2 cm (position) and/ or 3 cm (height). Measuring or documentation however requires a higher accuracy within the millimeter range, which can be obtained by recalculation through the virtual post-processing procedure (ascos ViPP).

Unrestricted action radius

Data-communication is made possible both by GPRS in RTCM format and by GSM. For applications in railway surroundings, such as track construction works, the DB-Netz GSM-R can be used. The appropriate hardware is available at ascos. Transmission disturbances and net problems belong to the past.

For the ascos user 3D-Construction management offers clear advantages regarding economy, efficiency and flexibility. An installed base station uses radio for the data communication. The action radius therefore is limited to approximately 1 km. As soon as this border is reached, the reference station must be dismantled, measured-in again and installed again. This time-consuming procedure requires solid measurement know-how and much patience, in order to ensure the necessary precision during the positioning of the basis.

No base station needed

When using ascos services you do not need a base station. Enterprises, which have not reequipped their machines yet, and therefore

do without their own reference, do not need to do without the advantages of ascos precision. Measurements using satellite positioning is fast and precise with a minimum of personnel. Thus preparation and shifting times are reduced substantially. At any time sufficient satellite visibility is guaranteed by the fact that ascos is the only company supporting the processing of Germany-wide GPS and GLONASS signals.

Real-time conversion

The conversion of the data into the reference system of the respective country or client (e.g. DB-Ref) is no longer necessary. Ascos-users have the option in the 3D building site management to use the automatic real time



transformation service 'ascos trans', where the correction data is already converted.

Transparent costs

In the calculation substantial personal and hardware savings are possible. For the high intensity users within the building range ascos offers particularly favorable Flatrates, which optionally also include the data communication over GPRS or GSM. High telephone costs this way are in the past.

This way working with ascos counts equally for starters and users. Prospective customers can first use a free and noncommittal test offer and in a detailed consulting decide on the optimal personal tariff.

ascos satellite positioning services

