

Trimble Productivity: Mobilize your Construction Workforce



## TRIMBLE SITE POSITIONING SYSTEMS

# THE MODERN TRIMBLE CONSTRUCTION SITE

## ***The Connected Construction Site***

***An interesting thing happens when you connect your office, people and machines. Productivity jumps. Rework disappears. Cash flow improves. Profits soar. Only one company has the technology and experience to connect your site. The leader ... Trimble.***

The new Trimble® Site Positioning Systems give the contractor in site preparation, heavy highway, mining, landfill, and waste disposal the ability to quickly resolve problems onsite... and the flexibility to complete any task with the right equipment. From initial site measurement to final as-built checks, when you need site positioning equipment that is productive, easy to use, and gets the job done right every time, Trimble Site Positioning Systems are your best choice.



### **SITE CONTROL OPERATIONS**

Calibrate the jobsite for GPS operations. Record existing and new control points in convenient locations for total station operation or daily GPS check shots.

### **GENERAL SITE MEASUREMENTS**

Position and record the location of features onsite, such as power lines, utilities, manholes, pipe inverts and existing structures.

### **GRADE CHECKING**

Check both the finished grade and laid material thickness to get an instant report showing areas for rework. Monitor overall accuracy and consistency of grading operations.





**Central to the Trimble Site Positioning System is the powerful Trimble construction software for field and office.**

Developed specifically for the needs of heavy and highway contractors, the Trimble SCS900 Site Controller Software simplifies site operations, increases efficiency in the field, and minimizes downtime at every stage of the project. Combined with Trimble Construction

office software options, you have the broadest, deepest and most advanced set of tools for integrating measurement, data management, workflow and site operations management throughout the construction life cycle. Trimble Site Positioning Systems offer you the choice of GPS or total station-based positioning.



**PROGRESS VOLUMES**

Measure surfaces and use those for computation of surface to surface volumes e.g. original or current ground compared to finished design. Quickly and accurately assess material stockpiles.

**STAKEOUT**

Stake out site features such as embankments, grading limits, utilities, pads, structures, hydrants and manholes. Navigate using the real time map, select the stakeout feature from the live map and display cut / fill data to get to grade.

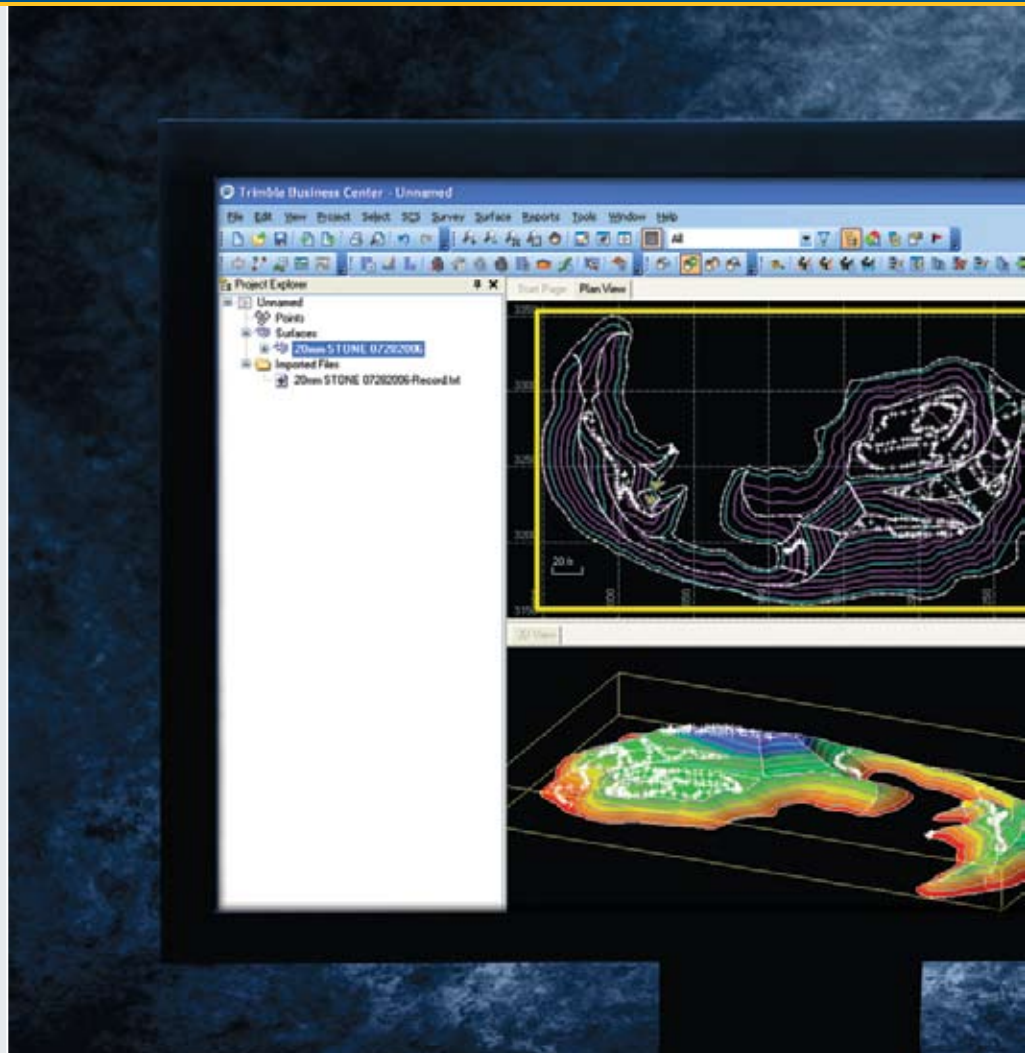
**AS-BUILT SITE MEASUREMENT**

Carry out as-built site measurements for client submission and approval at the end of the project. Produce high-quality reports and impress the client with thorough QA/QC processes.

# TRIMBLE CONSTRUCTION SOFTWARE SOLUTIONS

Before the first machine can start earthmoving operations, there is considerable planning and design work to be done. Digital data seamlessly connects the design engineer, data manager, supervisor, machine operator, and grade checker into an integrated workflow. The same digital information created for the site design and project planning can be used for machine control to ensure accurate grading - and for site positioning during and after project completion.

Trimble offers a suite of office software products that provide a wide range of capabilities facilitating job functions from planning and bidding to complete project productivity analysis. The data flow between suite components is enhanced by the fact that all the components of the solution come from a single source and single manufacturer.



## CREATE ACCURATE INFORMATION FOR THE BID STAGE

Rapid takeoff tools provide accurate models for the generation of quantity data for materials and earthworks operations on the project. Give your company the competitive edge, win more bids and increase your profits. At bid stage you can:

- Take off material and earthwork quantities quickly and accurately
- Bid more projects, contract those that are most profitable and improve your bottom line
- Provide value engineering to the client through better process, improved material usage and balanced earthworks

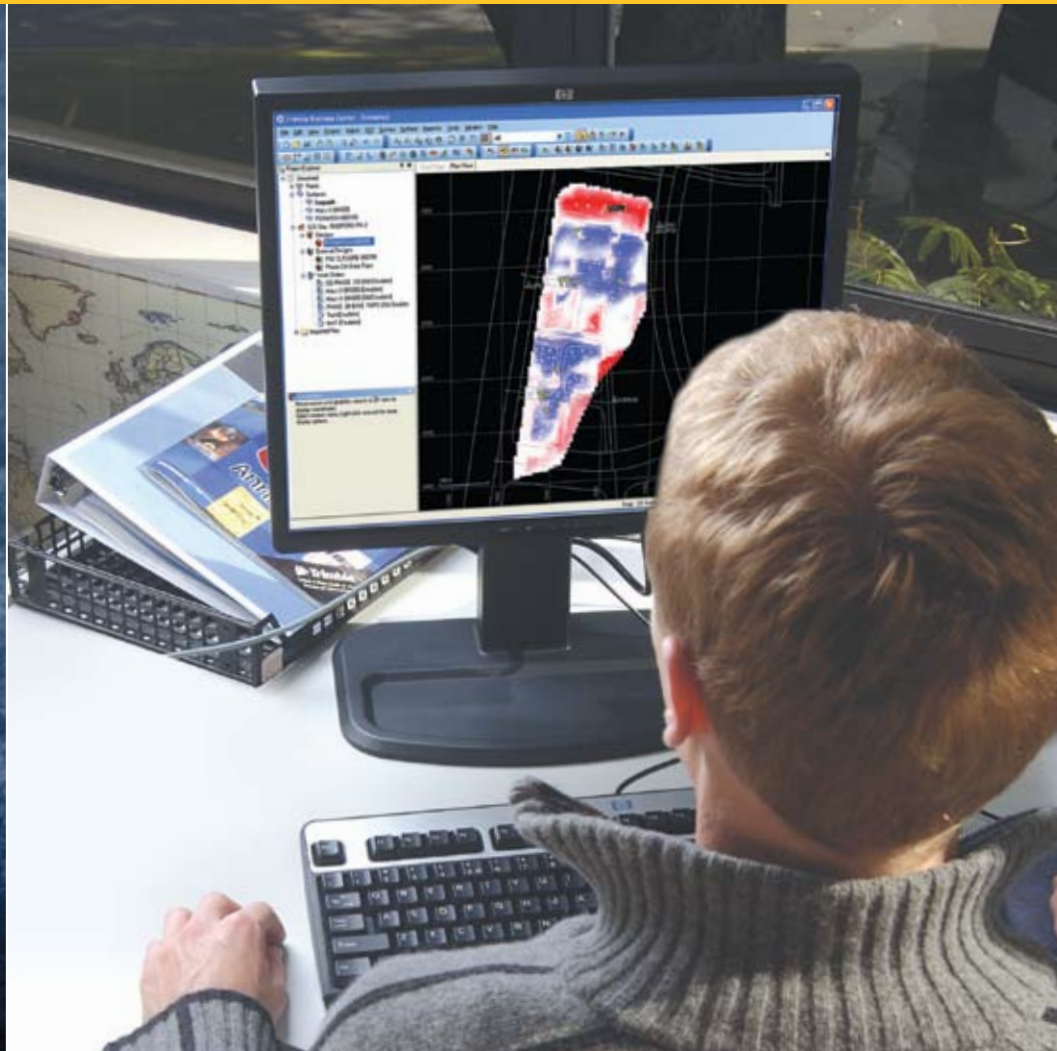
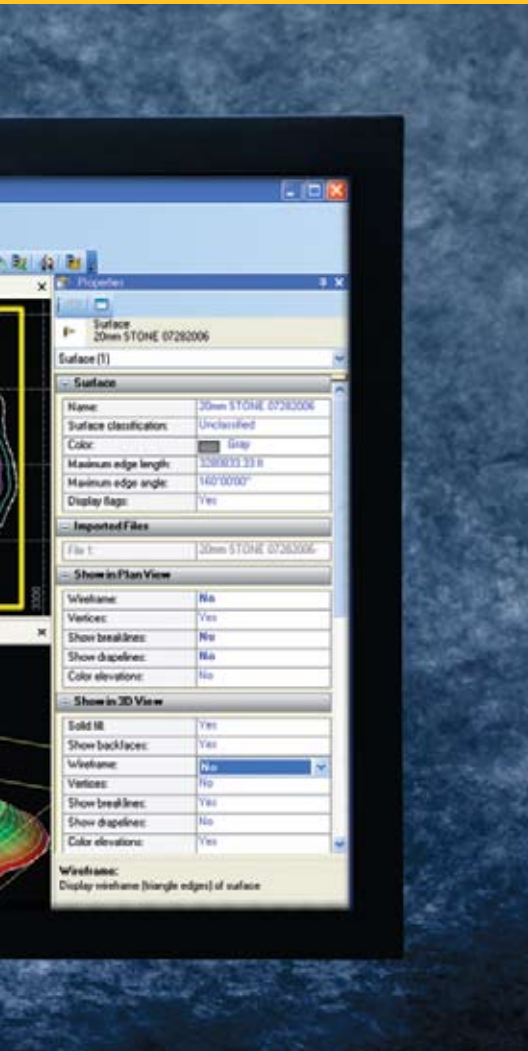
## PREPARE DIGITAL MODELS FOR SITE AND HIGHWAY PROJECTS

- Import data provided by the engineer and validate it
- Prepare accurate surface models for grade control and CAD data for stakeout operations
- Evaluate areas of cut and fill, determine mass haul information for the project to determine equipment requirements and schedules
- Evaluate the models in 3D for mistakes prior to starting work. Good data preparation can help identify and resolve site problems before breaking ground - saving time, money and potential conflicts.

## MANAGE GRADE CONTROL OPERATIONS

- Transfer site models to the on-machine grade control systems over the site wireless network or via data cards prepared in the office
- Create site maps to provide graphical information required by the operator
- Track data in use by each machine on the project. Send updated designs out quickly in response to design changes
- Monitor compaction operations
- Run diagnostic checks on machines to resolve problems and recommend remedial actions where required





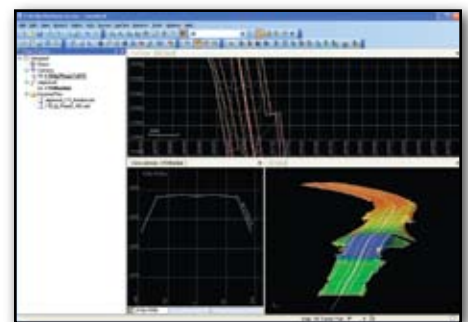
### SUPERVISE, REPORT AND ANALYZE PROGRESS

- Conduct grade and material thickness checks and generate high quality reports
- Monitor progress volumes for the site to keep the project on schedule
- Track all site measurement and stakeout activities
- Make on the spot informed decisions based on factual data

### TRIMBLE INTELLIGENT DATA TRACKING

Trimble field and office software solutions are designed to work together. Data changes made in the office or by a field crew are automatically recognized and used to populate the project database and are routed to all other crews that need the data.

Trimble Intelligent Data Tracking means that everyone has the latest and most up to date information at all times, reducing the possibility of making mistakes caused by having out of date models.



# TRIMBLE SCS900 SITE CONTROLLER SOFTWARE

Trimble SCS900 Site Controller Software was designed from the ground up for contractors carrying out measurement and stakeout for earthworks, landfill cells, waste disposal, and mining. This easy-to-use software helps you efficiently control and quantify site operations so you don't need to rely on a contract surveyor for site measurement and stakeout requirements. It is easy to learn and can be used with Trimble GPS or total station positioning equipment to maximize investment in both hardware and software systems.

You can use SCS900 software at every stage of construction:

- Perform initial site measurement and verification of original ground levels
- Measure site features
- Check finished grade and laid material thickness
- Topo site or material stockpiles and compute volumes
- Stake out location of features onsite, such as power lines, utilities, manholes, pipe inverts and existing structures
- Carry out as-built site measurements



## USE THE SOFTWARE DESIGNED FOR SITE POSITIONING

Designed for the daily needs of heavy and highway contractors, SCS900 employs dedicated task-specific menus and reports that streamline data management and on-site measurement tasks.

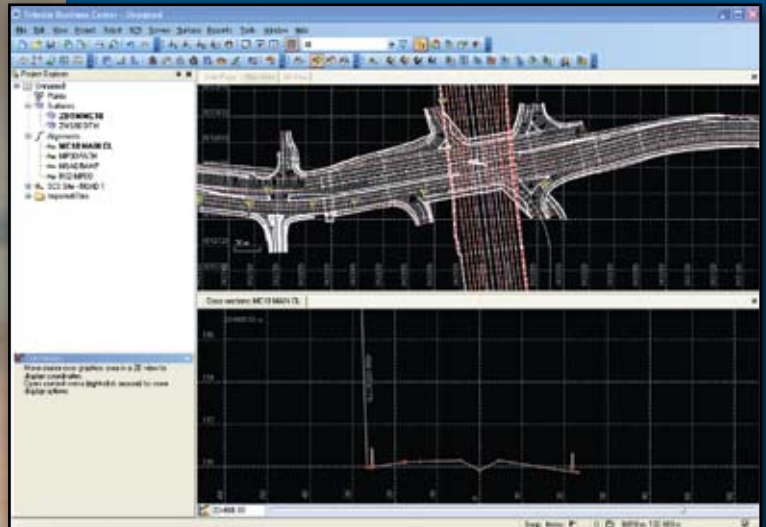
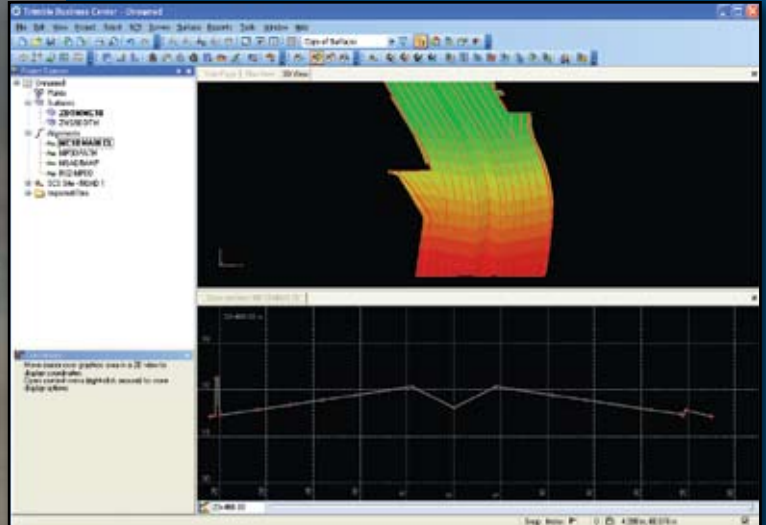
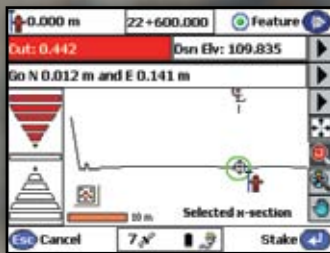
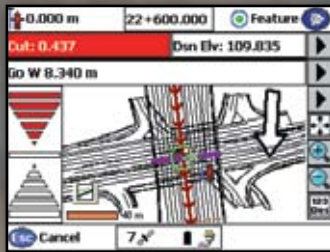
## STREAMLINE ADVANCED ROAD CONSTRUCTION PROJECTS

SCS900 supports both simple and complex highway projects incorporating full alignment geometry, station equations, width transitions and multiple roadways within a selected road job. The road stakeout and measurement module provides a single solution to all highway staking needs - from clear and grub lines to catch points and finished grade feature staking. In addition, the grade checking functions provide the solution for as built checks and quality control.

## PERFORM STAKEOUT TASKS QUICKER

The side slope function allows you to control the stakeout of complex side slopes in the field, without having to compute them first in the office. It works with live site conditions and adjusts automatically to ground elevations as found on the project, allowing you to react and adjust accordingly without wasting valuable site time.





## CLOSE THE GAP BETWEEN SITE AND OFFICE OPERATIONS

The SCS Data Manager allows you to automatically transfer and manage data between the office and field. You can organize, manage and track all site measurement and stakeout operations for multiple crews on multiple jobsites. Plus, preview work in from the field or review work order and design information before delivery to a field crew.

## SUPERVISE OPERATIONS FROM THE FIELD

The Trimble SCS900 Tablet Edition combines the easy-to-use data management system of Trimble SCS900 software with the graphics capabilities and processing power of a tablet PC. In doing so, it extends the use of the software to construction jobsite supervisors, foremen and project managers who coordinate job activities from a vehicle

## ADDITIONAL FEATURES OF SCS900 INCLUDE:

- Real-time cut and fill maps
- Digital plans in the field – eliminate rolls of paper plans
- GPS position on the plan – immediately locate yourself on the map to interrogate the digital information from the plans
- Query the data in the model, elevations, cuts / fills, distances, areas, current volumes and more

# TRIMBLE SITE POSITIONING SYSTEM TOTAL STATIONS. THE ULTIMATE IN PRECISION AND PRODUCTIVITY.

## INNOVATION FROM THE LEADER - DESIGNED FOR YOUR CONSTRUCTION SITE OPERATIONS

Trimble total stations build on over 50 years of total station technology innovation to deliver unmatched performance for construction jobsite applications. From initial site measurements to finished grading, Trimble total stations let you take control of your site measurement, stakeout, and machine control requirements and eliminate the daily need for contract surveyors.



## TOTAL STATIONS FOR SITE POSITIONING AND GRADE CONTROL OPERATIONS

Now with Servo, Autolock, Robotic, DR Reflectorless and ATS modes of operation, the powerful Trimble SPS730 and SPS930 Universal Total Stations satisfy all site measurement, stakeout, reflectorless measurement, and grade control needs - all from one highly accurate instrument.

## IDEAL FOR FINE GRADE CONTROL

Trimble Universal Total Stations allow the user to reliably track a machine target and know the data is being passed from the instrument to the machine as quickly and accurately as possible. The motor grader or dozer operator can conduct real-time fine grading operations to millimeter accuracy while minimizing rework and increasing profits.







Here are some key factors to consider when deciding whether to use GPS or total station for your application requirements:

FACTORS	TOTAL STATION	GPS
Accuracy/Precision needs	Accuracy – <3mm (.12 in)	Accuracy – <10mm (.39 in)H; 20mm (.78 in)V
Safety and accessibility	With DR reflectorless capability, measure to dangerous and inaccessible surfaces from remote locations easily and safely.	Base station located safely away from heavy machinery zone. No line of sight base to rover restrictions.
Single or multi-user operation	One instrument supports a single rover asset.	A single GPS base station supports multiple GPS rovers or GPS grade control systems on the same jobsite.
Coverage area from a single setup location	Line of sight dependent, <700m robotic range for typical topo measurement and stakeout operations.	>3 mile (5km) range from base station for typical topo measurement and stakeout operations. With repeater radios or via use of cell phone communications over longer ranges are possible.
Ease of use and operator skill	Easy-to-learn and use SCS900 interface eliminates the complexities associated with traditional surveying systems. The system is designed for use by supervisors, foremen, grade checkers and site engineers.	
Operating conditions	Ideal where line of sight to the sky is obscured or partially blocked by trees, buildings, structures, bridges or tunnels.	Ideal for large, open site operation.
Sensor calibration	Mechanical design needs routine periodic calibration and checks to deliver specified accuracies.	Needs no routine calibration to deliver specified accuracies.



### ADVANTAGES OF TOTAL STATIONS

The simple solution to all your site positioning needs, Trimble total stations provide superior tracking during measurement and stakeout phases, for machine guidance, and final as-built checks. Their single-person operation increases cost savings and productivity.

#### Applications

- Layout of structures, foundations, caissons and piles
- Tunnel measurement
- Earthworks, fine grading and finishing stakeout operations
- Reflectorless measurement of stockpiles, rock faces, cuttings and structures
- Initial site measurements to verify design levels
- As-built records and grade checks on laid material



# TRIMBLE SITE POSITIONING SYSTEMS GPS SOLUTIONS. SMARTER PRODUCTIVITY ON ANY SCALE.

## INNOVATION FROM THE LEADER - DESIGNED FOR YOUR CONSTRUCTION SITE OPERATIONS

### BETTER GPS UPTIME

Trimble GPS systems are guided by the powerful Trimble RTK engine. Stronger signal acquisition from more satellites – including GLONASS and modernized GPS – means you can run faster, longer, and without interruptions.

### FUTURE READY, NOW

Trimble site positioning systems support all currently available positioning constellations including OmniSTAR, SBAS, GPS and and GLONASS signals and will track the modernized GPS L5 signal when it becomes available. You won't have to invest in new systems to take advantage of the latest signal capabilities.

### OPTIONS THAT GROW WITH YOU

Trimble GPS systems are designed to meet the specialized needs of the construction industry. You can choose among a range of options to suit your individual applications, flexibility, and performance requirements.

### INTERNET-ENABLED BASE STATIONS

A built-in powerful web server component enables increased operational efficiency and flexibility. Using an Internet-enabled base station allows for remote configuration and monitoring of a base station, eliminating the need for time-consuming and costly visits to the base station to set up each day or diagnose issues that may arise. Internet base stations can provide corrections to multiple jobsites in the same vicinity, or provide corrections to cell phone enabled rovers in areas of radio blackout.







## ADVANTAGES OF SATELLITE POSITIONING

Using satellite positioning signals from the currently available GPS and GLONASS satellites and all available correction systems, the Trimble Site Positioning System GPS receivers are well suited to work anywhere that has a clear line of sight to the sky. Real-Time Kinematic (RTK) GPS delivers centimeter level (0.03 ft) accuracy—even when you're on the move—making it well suited to on vehicle or machine operations. RTK GPS technology can provide accurate positions at long distances from the base station, so most construction sites are covered from a single setup location.

## SMART GPS VERSUS MODULAR GPS

The Smart GPS Antenna concept gives you everything you need in one single unit, while the modular GPS Receiver features a separate antenna and receiver. The Smart GPS Antenna is your ideal configuration for rover systems mounted on a rod or supervisor vehicle and allows for fast daily setups as a base station. The Modular GPS Receiver can be used as either a base station or a rover and provides the flexibility to be configured for your specific jobsite needs. It also allows you to leave the receiver and radio in the site trailer secured, while only the antennas are on the roof of the trailer exposed to the environment.

## Applications

- Permanent and semi-permanent base station installations
- Site supervisor vehicle-mounted systems
- Pole or ATV-mounted stakeout and measurement applications
- Vessel-mounted marine RTK systems
- Marine survey and construction vessel operations on dredges, cranes and piling rigs.



## Productivity is...

### Planning

software that optimizes transportation routes to minimize project time and costs.

### Design

data preparation and management for the construction jobsite life cycle.

### Grade

control that is faster, more accurate and minimizes rework.

### Check

measurement, stakeout, quality control and progress monitoring on the job site.

### Construct

with precise positioning for faster completion with less re-work.

Only one company can optimize your productivity with the broadest, deepest and most advanced set of tools for integrating measurement, data management, machine operations and asset management throughout the construction life cycle. Productivity is... Trimble.

# Trimble Productivity

Go to [www.trimble-productivity.com](http://www.trimble-productivity.com) to learn how contractors are using these Trimble Systems for significant time and money savings.

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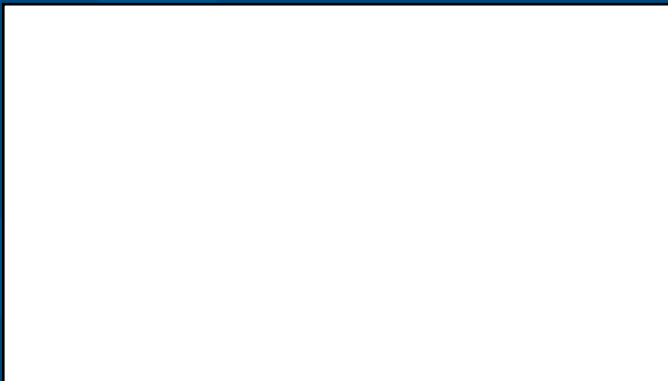
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**YOUR LOCAL TRIMBLE OFFICE OR REPRESENTATIVE**



### KEY FEATURES

- Fast to learn, easy to use software for GPS and total station operations
- Comprehensive tools for site measurement, grade checking and stakeout
- In-field surface modeling of measured data including contour generation and volume computations
- Works with construction tolerances for in the field quality control of material thickness and grade checking operations
- Continuous real-time position, station and offset, elevation and cut/fill to the selected design
- Powerful management tools organize data for multiple crews into sites, designs and work orders facilitating rapid access and automated retrieval of interrelated information in the field or office
- Automated, high quality reports of all recorded measurement and stakeout information

### TAKE CONTROL OF THE JOBSITE

Trimble® SCS900 Site Controller Software provides heavy and highway contractors an easy to use solution for site measurement, grade checking and stakeout. Combined with Trimble Site Positioning System GPS+GLONASS receivers or total stations, the Trimble SCS900 software allows the contractor to take more control over the job site — whether it is a small site development or major highways project. Now contractors are empowered to conduct their own site positioning tasks without the need to call in a contract surveyor to set stakes or compute volumes.

Contractors in highways, site preparation, earthworks, landfill, waste disposal, and mining can use Trimble SCS900 Site Controller Software for:

- Establishing and checking site control for GPS or total station operations
- Performing initial site measurement and verification of original ground levels
- Measuring and locating existing site features
- Checking finished grade and laid material thickness against design elevations and tolerances
- Computing progress and material stockpile volumes
- Doing stake out for earthworks, side slopes, catch points, roads, utilities, finished grade, pads and structures
- Managing, monitoring, and conducting quality control for excavation and grading operations
- Assessing as-built measurements and generating high quality reports for record keeping, client approvals and payment purposes

### Graphics, Color and On Screen Reports Simplify Stakeout and Measurement Tasks

Trimble SCS900 Site Controller Software uses color coverage maps to quickly show areas of cut and fill on the project, incorporates a laser receiver style lightbar to indicate on grade status, and generates on screen reports for stakeout

that show the user how and what to write on the stake. These simple tools increase productivity, eliminate mistakes, and drive consistency — even with inexperienced operators.

### Automated Reporting and Easy Analysis

Trimble SCS900 Site Controller Software stores its measurement and stakeout records in industry standard DXF files complete with all linework and surface models, or in Microsoft® Excel® spreadsheets formatted and ready to print. All operations are carried out with reference to tolerances for position, grade or material thickness. Out of tolerance data or cut/fill information is color-coded for immediate identification and data filtering in reports. The reports generate pie charts, bar charts, or graphs for easy analysis of completed operations.

### Portable, Up to Date Information Facilitates Decision Making

Trimble SCS900 Site Controller Software is also much more than just a site measurement and stakeout tool. This powerful construction software mobilizes the entire site workforce with portable up to date digital design information. Grade checkers, engineers, surveyors, inspectors and site supervisors all have the same information available — a set of plans that can be taken anywhere in any conditions, with instant location or navigation on the map. Design queries are simple and quick to execute. If the data isn't already stored, it can be keyed in, interpreted from what is available and used to compute slopes, distances, areas, volumes and cut/fill in seconds. The software facilitates instant, on the spot decision making, while troubleshooting site problems and managing day to day operations.



# TRIMBLE SCS900 SITE CONTROLLER SOFTWARE

## Expert Information Management Eliminates Delays

What's more, Trimble SCS900 Site Controller Software manages projects, carries out QA and QC operations quickly and efficiently and eliminates office data computations and bottlenecks associated with competitor software products. The SCS900 data management system automatically files and organizes information, so it can be located and retrieved on demand, providing the information and recorded traceability that is critical for the success of a project.

Using Trimble Intelligent Data Tracking technology, the Trimble SCS900 Site Controller Software ensures that all crews and the office data manager always have the same, correct and latest information. Control and stakeout points created by one crew or design changes made by the office data manager are copied to all crews on the project.

This structured approach to data management eliminates site problems, reduces errors and associated rework, and allows productivity and performance of field crews and site machinery to be monitored and analyzed.

## Available for Handheld Controllers or Tablet PCs

Trimble SCS900 Site Controller Software is the power behind the Trimble Site Positioning Systems product family and is available in two configurations:

- Trimble SCS900 Site Controller Software for use as a rugged, portable solution for site positioning applications using Trimble TSC2<sup>®</sup> and Trimble TCU controllers.
- Trimble SCS900 Site Controller Software Tablet Edition (TE) for use as an in-vehicle solution on a laptop PC or tablet computer. Trimble SCS900 TE utilizes the processing power and large screen capabilities of the PC for handling large project data sets and providing position, real time cut/fill, site management and supervision.

## AN IMPORTANT COMPONENT OF THE TRIMBLE SITE POSITIONING SYSTEM PORTFOLIO

Trimble SCS900 Site Controller Software powers the Trimble Site Positioning System portfolio, featuring the broadest range of positioning sensors:

- Trimble SPS781 and SPS881 Smart GPS Antennas
- Trimble SPS751 and SPS851 Modular GPS Receivers
- Trimble SPS730 and SPS930 Universal Total Stations
- Trimble SPS610 Total Station
- Trimble SPS651 Modular GPS Receiver
- Trimble SPS551 Modular GPS Receiver
- Trimble GPS Pathfinder<sup>®</sup> XB Receiver

## MINIMUM HARDWARE REQUIREMENTS FOR TRIMBLE SCS900 SITE CONTROLLER SOFTWARE

Trimble SCS900 Site Controller Software is designed to operate on the Trimble TSC2 and TCU field controllers.

The minimum requirements for the laptop or tablet computer running Trimble SCS900 TE are:

- Pentium-based computer with 1.0 GHz processor or faster, 256 MB RAM and 1 GB hard drive available prior to installation
- Microsoft Windows<sup>®</sup> XP operating system, Microsoft Windows XP Tablet PC Edition operating system, The Windows Vista<sup>™</sup> operating system
- Touch screen or mouse
- 800 x 600 display resolution for standard laptop or tablet; 800 x 480 for Ultra-Mobile PC

## Recommended Hardware

Samsung Q1 Ultra-Mobile PC or Panasonic Toughbook-19

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