



Carlson[®] **Machine Control**

*New application
& product videos*

Site Management & 3D Positioning Solutions for
Mining, Landfills, Dredging & Earth Moving



**GNSS
Inside!**



Carlson is here for you

Choice. That's what we're hearing from the market: a clear request for choice. The freedom to choose which brand of GNSS, sensors, total stations and other hardware to utilize along with the best application software. Software solutions that support all equipment, manufactured by independent, non-aligned software companies focused on real customer needs like ease-of-use, powerful feature sets, prompt tech support, software integration and cross-product compatibility. YOUR best 3D solution.

That's where Carlson Software comes in. We offer the complete suite of 3D solutions, across the disciplines of data collection, surveying, engineering design and drafting, mine planning and modeling, construction estimation and machine control.

Carlson encourages and welcomes feedback across our wide product range that includes Carlson Civil and Carlson Takeoff for construction estimation, and Carlson Grade for machine control. It's this invaluable feedback that we receive from throughout the land development and mining industries that is used to ensure that our annual releases are always full of dynamic, customer-driven new features.



Bruce Carlson, Founder & President

Look to Carlson Software for technically advanced software and integrated hardware for the full life cycle of a land development project.

The industries served include: land surveying, civil engineering, construction/machine control, mining, accident reconstruction & agriculture.

Carlson has the highest dedication to customer service and is renowned for its free technical support. We work for you.

Powerful solutions that are easy to use

Drawing from Carlson Software's rich history and diverse product portfolio, our goal is to democratize site management, connectivity along with asset and machine positioning through open standards, easy-to-use software interfaces and an attractive price/performance proposition.

3D positioning is emerging from its infancy and impacting productivity in ways not seen since the innovation of hydraulics. In an industry where approximately 8 out of 10 potential users have not purchased, Carlson is excited to be one of the driving forces.

Carlson is "here for you," ready to answer your machine control needs.



*Randy Noland,
Vice President of Business Development
Director of Machine Control*



Site Management & 3D Positioning Solutions

Site Management

Mining

Drilling

Material Management

Solid Waste Landfills

Fleet Management

Piling

Dredging

Hardware Components

Grade Supervisor

Carlson Grade Supervisor is a premiere 3D/GNSS site management and inspection tool supporting most grading, mining, and landfill applications.

Grade Supervisor provides cut and fill information across the job site in real-time moving easily between a vehicle to a man-rover pole.

Grade Supervisor supports most GNSS receivers by offering the world's largest GNSS library.

Carlson Grade Supervisor is super simple to use and provides the following:

- Flexible user interface: can be as simple or as advanced as the user needs
- Support for most GNSS receivers
- 3D volumes-anytime with PDF export reporting
- In-Cab, on-demand training movies
- Microsoft Windows 7 compatible
- File compatibility and same user interface as our machine positioning software
- NTRIP compatible with most networks
- HeartbeatPro Connectivity between machines & office
- Compatibility with Carlson's desktop design software: Survey/Civil, Takeoff, Mining, Construction

Easily move between vehicle and GNSS rod



Carlson Grade Supervisor allows users to:

- Get real time cut/fill/on grade across entire project
- Collect/Stakeout/As-built points
- Direct import: DWG, DXF, TN3, GC3, LN3, TIN, GRD
- Handle large surface files up to 50MB
- Manage drawing layers
- Build pads: flat, single/dual/multi slope

Grade Supervisor



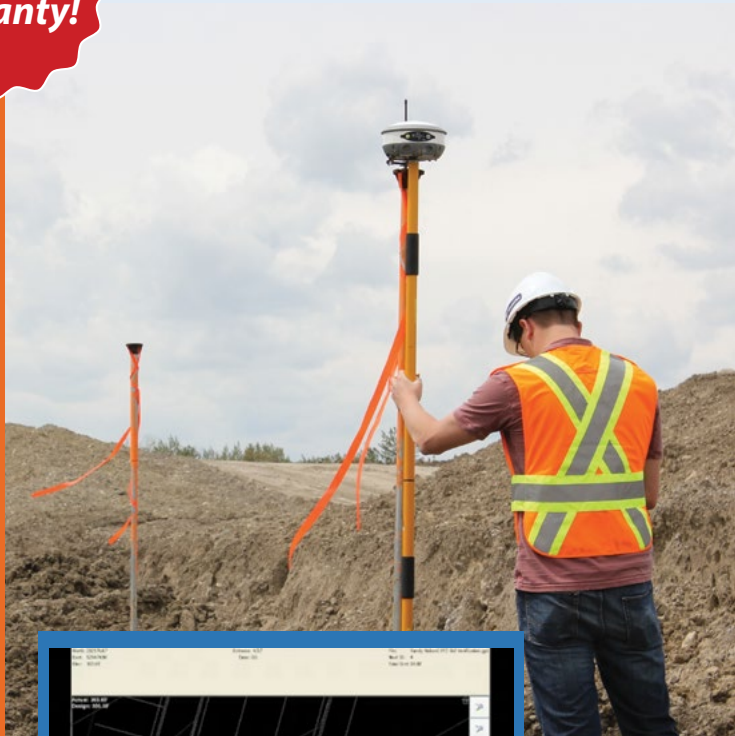
No cables, bundled pricing

**3-Year
warranty!**

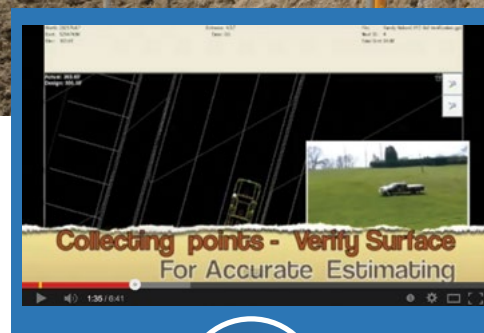
- ✓ Resolve problems onsite, quickly and easily
- ✓ Topo site for bid verification before moving any dirt
- ✓ Check grade and compute volumes for job progress

From initial site measurement to daily progress to as-built checks, Grade Supervisor is the right tool

Grade Supervisor supports legacy GNSS receivers allowing users to maximize previous investments



Grade Supervisor on YouTube
<http://www.youtube.com/playlist?list=PL5758241CB3D46A86>



WATCH



VIDEO

MineGrade™

Maximize your Mining Operations

Increase productivity and profitability with Carlson's Machine Guidance Systems

MineGrade™ is 3D machine guidance software that is easy-to-use offering a consistent user interface across all machines including dozers, shovels, draglines, bucket wheel excavators, wheel loaders, haul trucks, supervisor vehicles and more. Avoidance zones, simple and complex slopes, cut/full color mapping and proximity warnings are just a few of the many powerful features. Connect all machines and the back office with new HeartbeatPro™. Real-time monitoring has never been easier.



Features

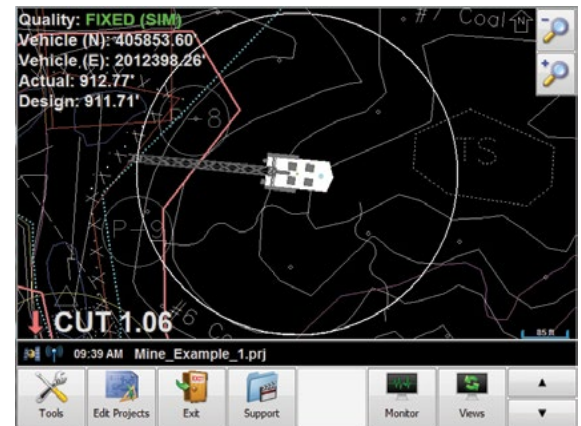
- Configurable on-board display
- 3D avoidance zones and surfaces
- Proximity warnings between machines and assets
- In-field ramp and bench design
- Real time cut/fill/on-grade to multiple design surfaces
- In-cab, on-demand training movies
- User definable tasks and delays
- Flexible user interface as simple or as advanced as the user needs
- Support for most GNSS receivers
- Collect/stakeout/as-built points
- Direct import: DWG, DXF, TN3, GC3, LN3, TIN, GRD
- NTRIP compatible with most networks
- Manage drawing layers
- Build pads: flat, single/dual/multi slope
- Handle large surface files up to 50MB
- Microsoft Windows 7 compatible
- Connectivity options - HeartbeatPro™

MineGrade™



Benefits

- Correct floor elevation
- Increase productivity through accurate push strategies
- Reduce idle time
- Easily mine to the design
- Reduce survey cost
- Keep personnel out of harm's way
- Get 24/7 survey assistance
- Increase safety with watch and warning zones
- Track materials
- Determine accurate overhaul costs
- Finish reclamation areas



Dragline tracking overburden volume



WATCH



VIDEO



Investing in Site Positioning Technology
<http://www.youtube.com/watch?v=JbWMxICSjWY>

MineGrade™ StockPile

MineGrade™ StockPile is a 3D machine guidance system designed for stockpile operations. The primary focus is on improved awareness and productivity. This is achieved by key features such as proximity warnings and avoidance zones (both vertical and horizontal).

3D positional monitoring references machines in relation to stockpile limits and material management infrastructure such as feeders/hoppers, overhead conveyors and other user-definable areas and obstacles.

MineGrade™ StockPile features are designed for dozers and wheel loaders and are adaptable to other machines



System Benefits

Accurately show machine position in three dimensions relative to material management infrastructure such as feeders/hoppers, overhead conveyors and other user definable structures.

Dramatically improve operator situation awareness with proximity warnings of other machines in near realtime.

Positional data relative to stockpile design and infrastructure facilitate all weather and 24/7 working hours.

Compatible with Carlson Machine Control's Fleet Manager Office. This enables each machines positional, proximity and avoidance zone data to be streamed to the back office for remote monitoring, remote alarms, flexible reporting and more.



MineGrade™ StockPile

System Features

Software Application

MineGrade™ StockPile is application centric software designed specifically for mine sites and stockpile management. MineGrade™ StockPile is easy-to-use reducing operator training.

Together, MineGrade StockPile and Carlson Machine Control's CBx6 Control Box Console provide:

- Simple, single component system install with battery backup shutdown
- Easy-to-use touch screen computer with Microsoft Windows 7
- Easy to see, day or night, large 10.1" sunlight readable, nighttime dim-able display
- Integrated GNSS receiver with scalable accuracy options up to 1cm via RTK option
- Rugged design that is job-site tough and backed by a 3-year warranty, which includes the integrated GNSS
- MineGrade™ StockPile shows angle of repose of the coal to the operator
- Watch and warning alerts inform the operator of feeder/hopper location

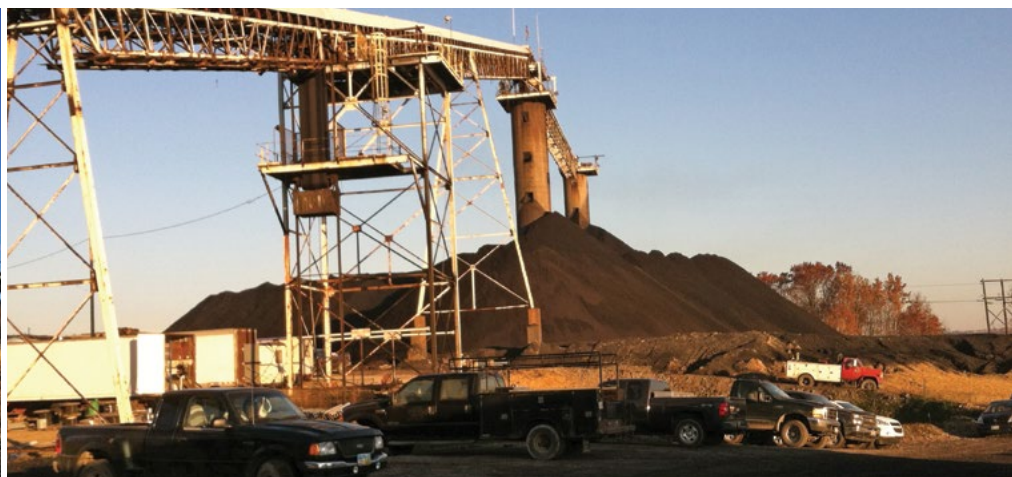


Service and Support, every step of the way!

- Remote login support to assist operator while in machine providing standard, open communications such as GSM cellular, ethernet, 802.11, mesh and other wireless communication systems
- Industry exclusive 3-year warranty

Applications

- Stockpile operations
- Mix and blend management
- Manage floor and slope grades
- Cleanup
- Operator awareness and monitoring



DrillGrade™ 3D Drilling System

Hole Navigation System for all types of Drill Rigs

Guides the operator so he can drill parallel holes to correct depth in a safe and easy way

Accurate Drilling = Better Blasting

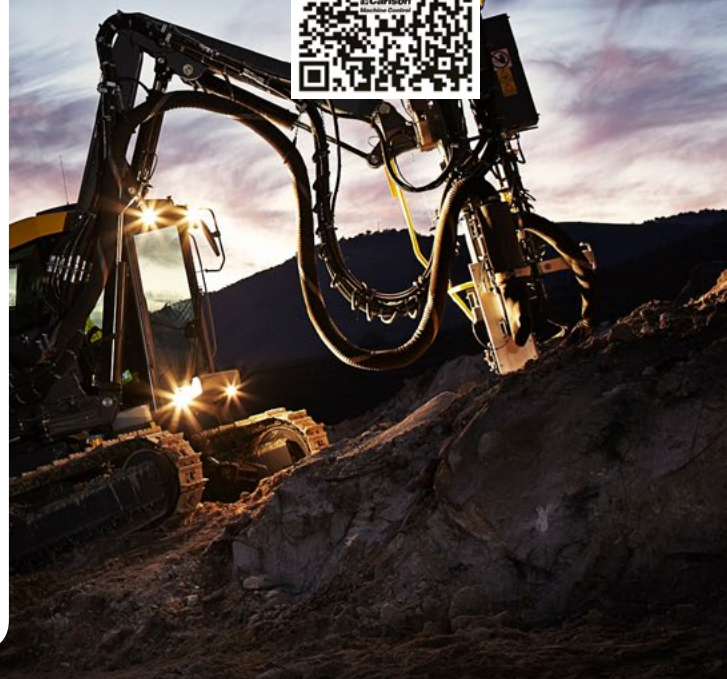
Better Blasting = Better Fragmentation

Better Fragmentation = Lower Downstream Costs

- Navigate & position from within the drill cab without any marks on the surface
- Easily create a drill pattern in the machine to a terrain model, depth and height.
- Load/change terrain models, localizations easily
- Visualize 3D surfaces in the field
- Handle simple localizations within DrillGrade™ not the receiver
- Supports FlexiROC™, SmartROC™ and RRC Atlas Copco drills and RCS HEC3 onboard system
- Retrofit to most any drill
- Get support for most all GNSS receivers with world's largest GNSS library
- Get near real-time system feedback with remote wireless monitoring
- Import/export DWG, DXF, csv and IREDES hole data
- Unlimited strata data logging
- Both vertical and angle drilling options
- Optional remote display for radio controlled drill rigs lets the operator use a lightweight external screen on his radio control box



**Compatible with
Atlas-Copco
SmartROC™
& FlexiROC™ drills**



DrillGrade™ 3D Drilling System

Carlson Software's DrillGrade™ System provides improved accuracy, efficiency and safety for all functions related to drilling and blasting. The features and benefits of DrillGrade™ lower drilling and blasting costs.

Overview

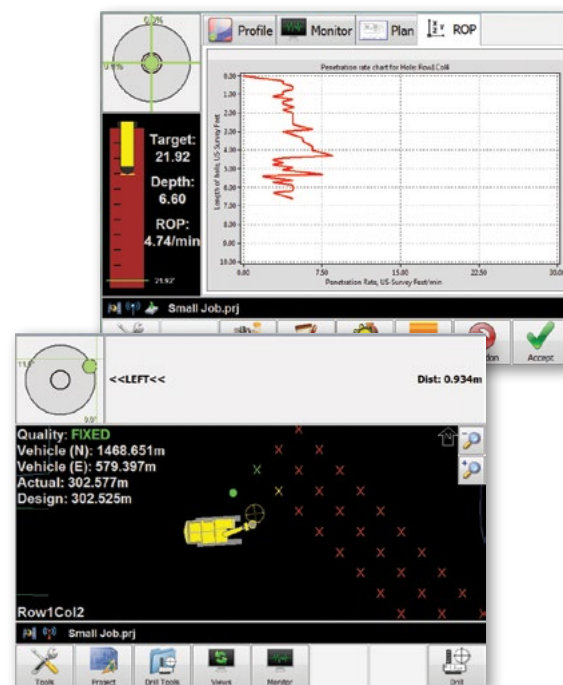
- Get correct angle and depth of all holes
- Enable correct hole and row distance at bottom of the blast
- Significantly reduce the need to mark collar points and depth

Benefits

- Reduces blasting costs
- Lowers survey costs
- Limits the need for sub drilling
- Enables all-weather operation, day or night
- Increases overall safety of operations
- Provides real-time information for operators and office personnel
- Keeps operator in the cab & out of harm's way, thanks to stakeless drill pattern layout
- Has both audio and visual alarms, set up for avoidance zones, to keep machines in safe working boundaries
- Prevents encroachment of individual machines with proximity warnings operators know each machine's location and alarms can be triggered if a proximity zone is breached
- Enhances fleet efficiency with as-built data recorded locally

Key Hardware Components

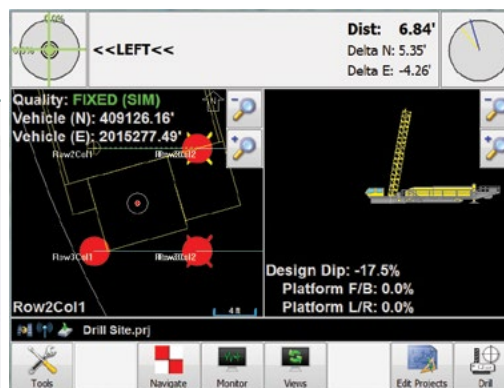
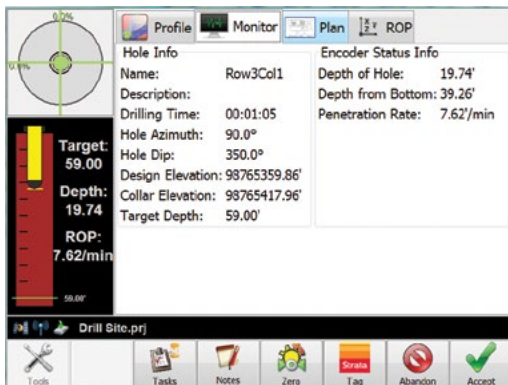
- CPU/Touchscreen Display - The CBx6 Control Box Console loaded with DrillGrade™ software
- Integrated RTK GNSS Receiver in CBx6
- GNSS heading unit such as the Vx6 or Vx1
- RTK Correction (UHF, 900Mhz, GSM, CDMA supported)
- Angle and length transducers to measure the movement of the boom and cradle
- Optional support for internal sensors for some drill manufacturers
- MC Pro Vx6 All-In-One Sensor RTK corrects for CBx6 Control Box Console internal GNSS offering machine RTK position & heading plus feeder RTK position with integrated RTK radio
- OmniStar Support for both the MC Pro Vx6 and CBx6 Control Box Console internal GNSS



Compatible with existing Atlas Copco heading solution over HEC3 system integration

Platform Drills

- Navigate & position from within the cab without the need for a surveyor
- Design from the office or in the field with easy-to-use interface
- Project & record hole depth
- Record & measure multiple drill parameters
- Set-up for angle drilling
- Get near real-time system feedback with remote wireless monitoring
- Do unlimited tagging of strata & extraction of strata information
- See real-time location of all working machines
- Reduce blasting costs
- Lower survey costs
- Limit need for over & under drilling
- Operate in all weather conditions, day or night
- Increase overall safety of operations
 - Stakeless drill pattern layout keeps operator in cab & out of harm's way
 - Audio & visual alarms set up for avoidance zones keep machines in safe working boundaries
 - Proximity warnings prevent encroachment of individual machines
- Get real-time information for both operators & office personnel



DrillGrade™ Desktop

New DrillGrade™ Desktop companion PC software

- Easily create IREDES drill patterns with support of DWG drawings and DTM's
- Excellent for construction where you wish to optimize drill patterns to fit the design plans
- Design holes from the office or in the field with easy-to-use interface
- Import/Export IREDES files
- Direct import of DXF and DWG files
- Runs on Microsoft Windows 7 platform



- Create project from office and send out to multiple machines
- Bring data back to office and create drill reports
- Bring data back to office from multiple machines merging data into a single drill report
- Add, edit or delete holes from existing patterns
- Quick access to total depth and number of holes drilled
- Export drill data in csv for import into other programs



TruckPro™

Manage your material. Manage your mine.

TruckPro™ is the GNSS-based assignment and tracking system for haul trucks. It enables dispatch operators to know haul truck locations and material types during transit, even in low visibility conditions.

TruckPro™ routinely broadcasts its position to the tracking system, enabling routing to be modified and speeds monitored for different road sections. Process and equipment performance can be monitored and analyzed for optimization.



**3-Year
warranty!**

**GNSS
Inside!**

Key Benefits for TruckPro™ :

- Reduced idle time
- Increased productivity
- Lower dilution
- Improved blending and stockpile management
- Enhanced recovery
- On-site support
- More accurate tracking for improved planning
- Comprehensive electronic reporting across the network
- Road speed analysis can lead to better roads for hauling
- Reduced staking
- Low cost alternative



TruckPro™

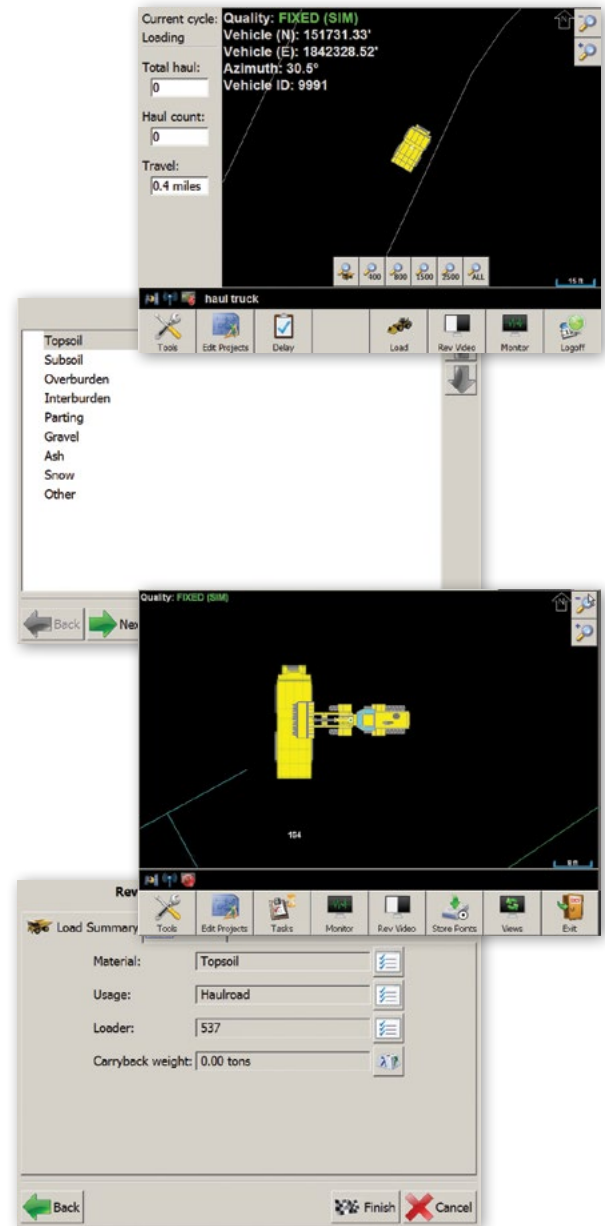
TruckPro™ is ideal for real-time tracking applications, since dispatchers can monitor haul truck locations, even in extremely low visibility conditions. By knowing the truck locations, the dispatcher can more accurately assign trucks to digging equipment. This means reduced idle times and elimination of excessive movement, which results in less maintenance and cost. Known load locations also enhance blending practices.

In addition, TruckPro™ aides the shift foreman or engineer in calculating material types and tonnages hauled for the shift. Furthermore, the heavy equipment operator has instant feedback on their performance statistics; thus, giving them goals in which to better perform.

TruckPro™ is scalable offering realtime, two-way connectivity or static connectivity (manual) if no wireless infrastructure is available. TruckPro™ also offers both a low precision (LP) or high precision (HP) option meeting tight budgets now and, additionally, more accurate functionality later.

TruckPro™ adheres to Carlson's Open Positioning Architecture (OPA) supporting shared data, multi-GNSS receivers as well as a consistent user interface across all MineGrade™ products.

TruckPro™ is part of Carlson's open ecosystem for site management.



TruckPro™ features include:

1. Track load and dump locations
2. Track material type
3. Track operator production
4. Track production from geographic areas (pits, shots, tracks, etc.)
5. Track machine production
6. Track loader production
7. Pre-shift inspection check
8. Customizable tracking
9. Customizable report builder



LandfillGrade™ Management System

Extend the life of any landfill



Designed for Landfill Compactors, Dozers, Graders and Scrapers

- Track your compaction in real time with color mapping using pass counts or vertical deflection
- Share data real-time between two machines with Dynamic Data Exchange (DDE) for maximum productivity
- Reduce airspace, maximize compaction, reaching optimum density in less time
- Easily generate Airspace Utilization Factor (AUF), density and volume reports
- Minimize daily cover
- Analyze productivity and report from anywhere

LandfillGrade™ Management System



Lower your Carbon Footprint with Carlson Landfill Grade

Enables optimal compaction with less passes for both lower fuel consumption and lower cost of operation while reducing machine wear

Makes best use of landfill by increasing density through accurate daily analysis reporting of actual material placement

Key features

- Eliminate overfill for outer design slopes
- True recording of actual material placement
- Avoidance Zones such as gas wells and hazardous material placement
- Import scale house weights for daily density calculations
- Forward/reverse compaction
- Collect & stake points
- Heartbeat Connectivity connects machines and office
- Remote monitoring of machines with Carlson Fleet Manager Office
- Proximity warnings between machines and other assets including vehicles and man-rovers
- Document placement of hazard materials such as asbestos

Special features

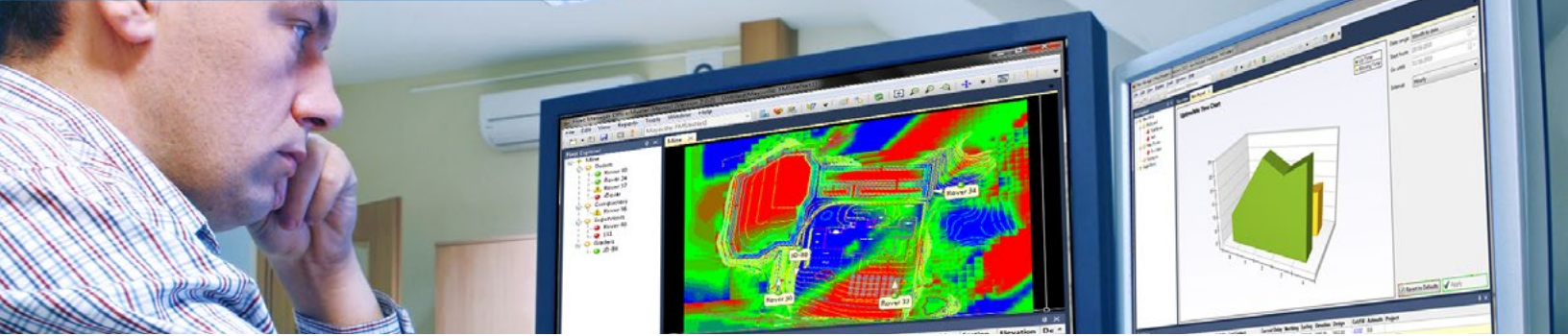
- Customizable screens
- Support for most all GNSS receivers
- Direct import of DWG, DXF, TN3, GC3, LN3, TIN, GRD and more...



Reaching optimum density in less time
<http://www.youtube.com/watch?v=bg30oQkTVo0>



Fleet Manager Office



All New Fleet Manager Office: A Command & Control monitoring and data management system that transmits data from the machines to the office and from the office to the machines, increasing both safety and productivity and enhancing training opportunities.

On both large and small job-sites, managers can see and monitor multiple machines in multiple views, including plan view, from any remote location as long as they have an internet connection. Machines' positions can be viewed, cut/fill and elevation monitored in real time, and managers can even instant message each machine. The system transmits through GSM/CDMA cellular, standard wireless and mesh networks. For sites without remote connectivity, data can be stored in the machine and copied to a thumb drive for post analysis.

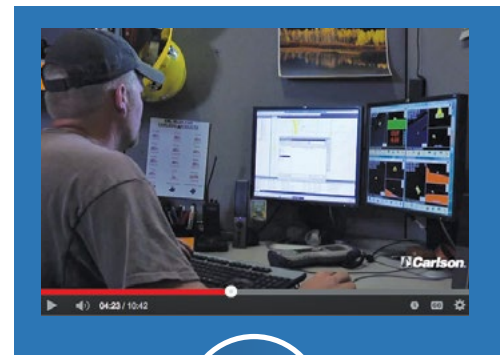
The scalable remote monitoring tool facilitates:

- Productivity analysis
- Data management
- On-site proximity warnings
- Avoidance zones, and more
- Tasks & delays/down-codes

Multiple VNC protocols are also supported for training and troubleshooting from the Command and Control Center.

Specialized features available with Fleet Manager Office include:

- A cut/fill color map
- Surface updating
- In-cab monitoring
- Multiple site views
- Dynamic data exchange (marrying of machines)
- Project creation/transfer
- Management of multiple sites



WATCH



VIDEO

Connecting it all together

http://www.youtube.com/watch?v=SY7_L8Gvrdw#t=45

All data is owned by the clients with the freedom to choose preferred hosting locations. Developed exclusively by Carlson, this product benefits from years of experience working with the managing needs of mining and landfill operations.

Customizable Report Generator

Reports include:

- Uptime
- Idle Time
- Delay and downtime tracking
- Travel distance
- Operator time sheets
- Project tracking
- Output to printer or directly to PDF
- Customizable layout
- Include your company's logo



PDGrade™ Machine Guidance for Pile Driving

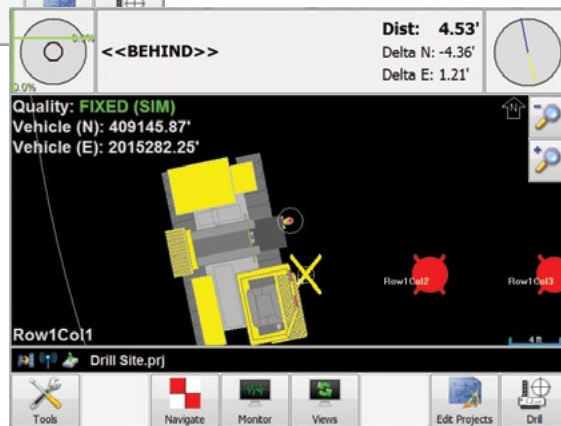
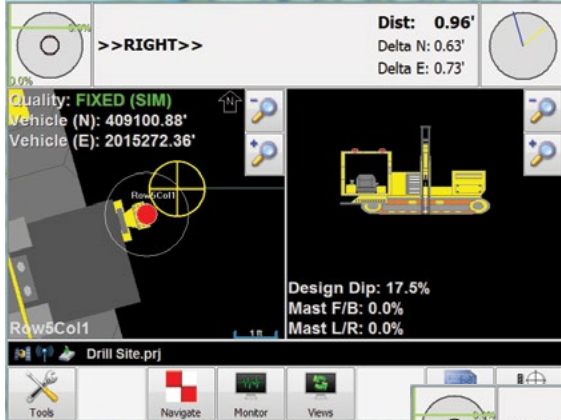
GNSS Guided Pile Driving System

Accurately and efficiently drive piles

Designed for light pile driving such as solar farm installation

Carlson Machine Control uses application-centric software created just for the solar farm industry combined with state-of-the-art, integrated GNSS All-In-One sensor (MC Pro Vx6) and a rugged, Windows 7-based Control Box (CBx6 Control Box Console). The system has an industry exclusive 3-year warranty and installs in under 3 hours.

This keeps machine downtime to a minimum.



The World's Most Advanced 3D Machine Control Solution

Small. Simple. Powerful.

*... is also
the simplest*



**Industry exclusive
3-year warranty!**



CBx6 Touch Computer + MC Pro Vx6

Advanced integration means only two hardware components offering simplicity of operation, installation and portability. Choose from Carlson Grade's application software products:

MineGrade™
LandfillGrade™
DrillGrade™
PDGrade™
DredgeGrade™

...and experience the most powerful, easy-to-use 3D machine control solution available

Advanced Component Replacement Option available for continued operation

Integrated MC Pro Vx6 - All-in-one 3D Machine Control Sensor

- Connects with only one cable
- GLONASS L1/L2 High Precision Position & Heading (up to 20Hz)
- RTK UHF Radio 4FSK - additional World Radio options available
- Pitch & Roll
- Rugged IP69K



Supports most machines

including dozers, compactors, excavators, shovels, scrapers, haul trucks, loaders, draglines and more



For Excavators dredging from land or water

Designed for Dredging Equipped Excavators

- Plan and profile views showing barge, excavator position and real-time depth information
- Real-time update of cut/fill/on-grade relative to DTM file
- Supports most GNSS receivers with the world's most extensive GNSS library
- Barge and excavator independent monitoring/visualization
- Support of angle sensors, flowmeters, and absolute or relative encoders
- Multiple attachment support
- Supports multi-boom, multi-stick and tilt bucket

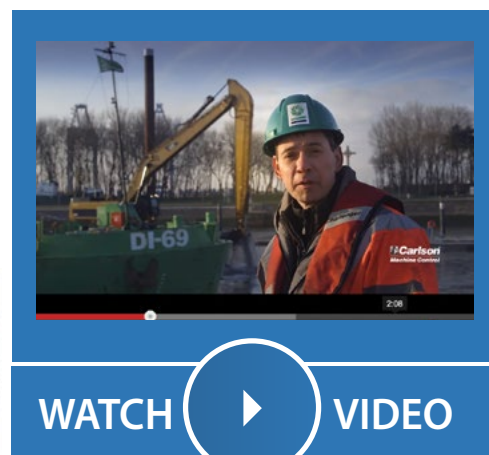
***Most productive
calibration routine
on the market.
200% faster!***



MC Pro Vx6/Vx1 & other heading options

Key Features

- Supports multiple surface file types directly including DXF and DWG
- Cut/Fill color map
- GSM remote support
- Ability to visualize progress in blind, underwater cuts
- Calculations menu - inverse, points on a line, create a CL from series of points, etc.
- Newly improved slope routine
- PDF output of points stored
- Coordinate editor
- Localization editor and global projections
- Unique calibration routine that is accurate and 200% faster

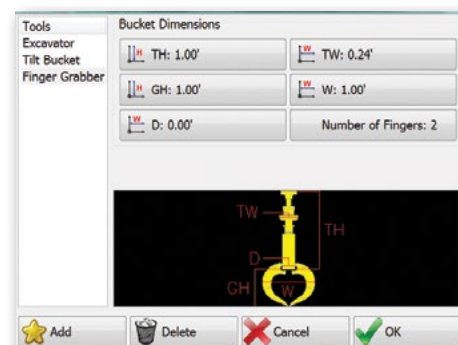


Dredging in Belgium

<http://www.carlsonmachinecontrol.com/products/applications/dredging.html>

Special Features

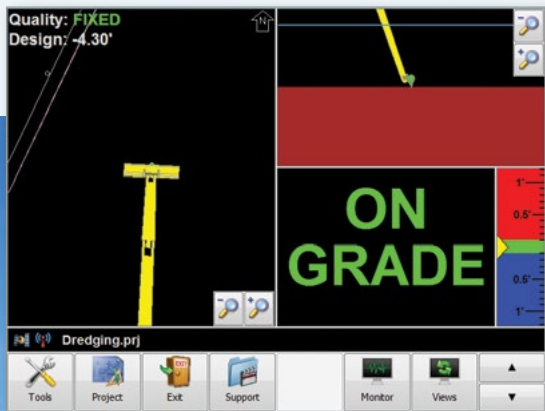
- Flowmeter support means no sensors directly on the bucket for harsh environments
- Hydraulic grabber support with open/close monitoring (no sensors on the grab!)
- Add your own custom tool attachment or machine design
- Log files recorded locally for post analysis
- Compatible with Carlson Machine Control's Fleet Manager Office™



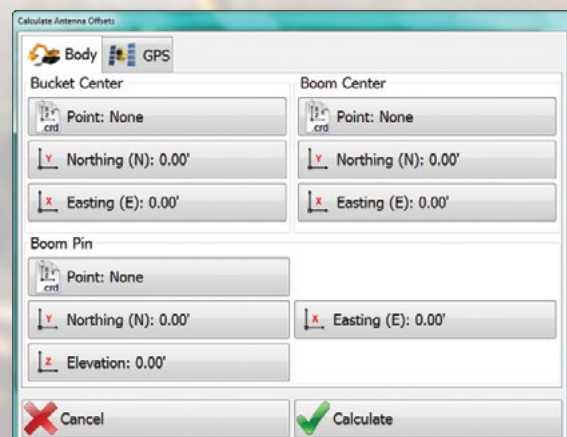
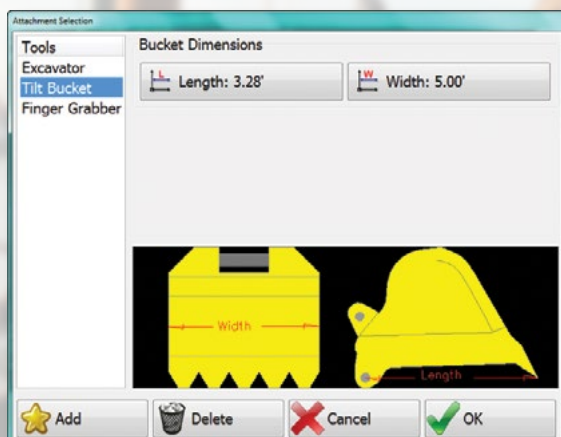
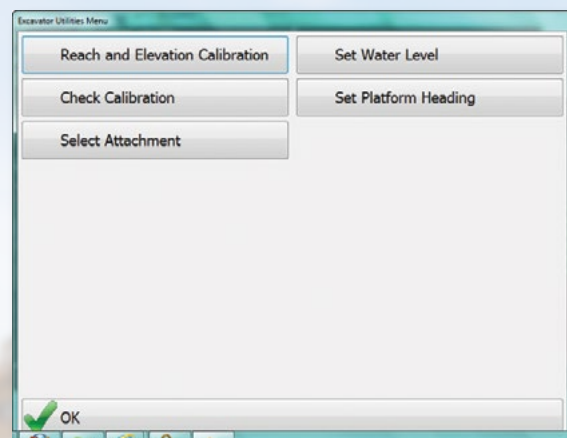
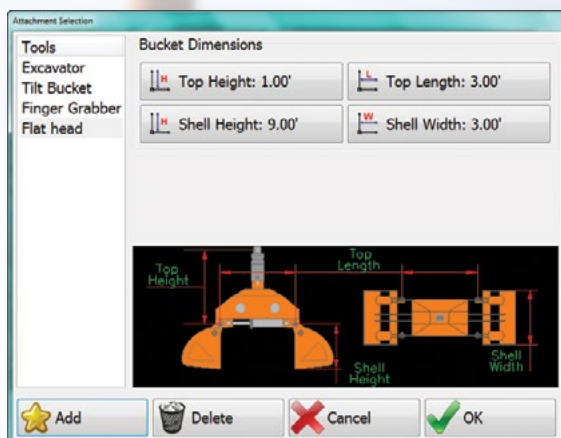
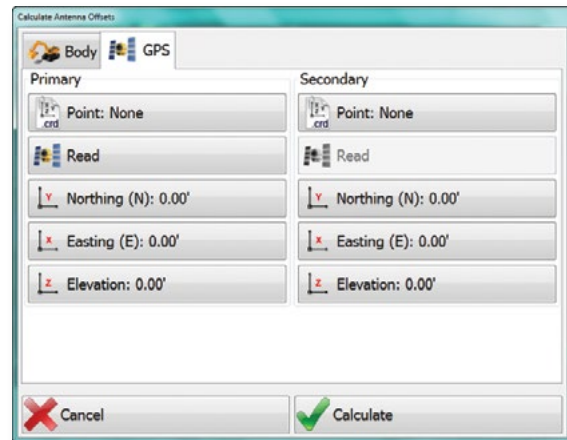
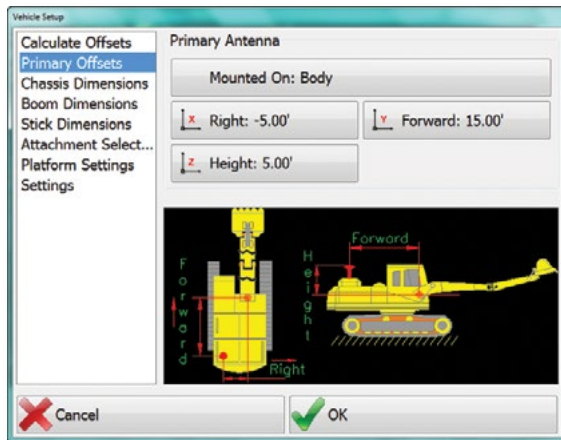
New Carlson SNx5 Sensors

- Software configurable for:
 - Single and dual axis
 - Angularity
 - ID and baud rates
 - CANbus emulation
- All sensors pre-calibrated in the factory so they can easily be replaced in the field with no recalibration
- Sensors have same connectors so cables can be installed bidirectionally
- Protective mounting plates and shield covers available
- Rugged! IP69K. Submersible up to 25 meters!
- Stainless steel construction for salt water applications

**Carlson's CBx6
Control Box Console
and Vx6 all-in-one
GNSS sensor has
3-year warranty!**



Multiple Tool Support



Carlson offers a turn-key hardware and software solution including the CBx6 Control Box Console with integrated GNSS option, axial sensors, external GNSS receivers and wireless mesh infrastructure for connectivity to meet your management needs.

For those who have already made a receiver investment, there is a good chance that Carlson software is compatible and can maximize your previous investments. Call us with the brand and model number and we will discuss compatibility.



CBx6 Control Box Console
GNSS Inside



A42 Antenna

**3-year
warranty!**



Supervisor Rugged Microsoft Windows 7 Tablet PC



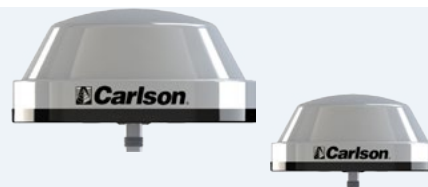
Heading Options



MC Pro Vx6
All in one unit!



MC Pro Vx1
Affordable L1 heading unit



VSx6

User defined heading for larger machines such as shovels, draglines and platform drills.

Base Station Options



BRx5
Mobile Base Station



Rx5
Permanent Base Station

Sensors



Carlson Dual Axis/Angular Sensor

Measures pitch and roll of machine to provide better accuracies





102 West Second Street
Maysville, KY 41056
800-989-5028
machinecontrol@carlsonsw.com



GNSS Site Management & Positioning Solutions for:

- Site Management
- Mining
- Drilling
- Material Management
- Solid Waste Landfills
- Fleet Management
- Piling
- Dredging
- Hardware Components

