

Simulation-based Equipment Operator Training Solutions



Vortex simulators provide an immersive environment that leads to essential skills development, increased safety, and reduced training costs. Developed by engineers, operators, trainers and simulation experts, Vortex simulators deliver an integral training solution to better prepare heavy equipment operators for the challenges ahead.

With Vortex simulators, organizations have an ultrarealistic and cost-effective solution for operator training and skill refinement that perfectly complements equipment seat-time. Our simulators enable organizations to optimize their capital assets and maximize the availability and capability of their equipment and operators.

To enrich training, Vortex simulators provide fully interactive virtual environments with high-fidelity physics simulations; high-resolution displays and real operator controls; accurate real-time operational data; authentic 3D graphics with 360-degree scenes; ambient sound simulation; configurable environmental settings, instructor's console and much more.



Vortex simulators provide an ultra realistic, immersive training environment with high-resolution displays and real operator controls.



Vortex tower crane simulator allows operators to prepare for day-to-day tasks such as fly-forming, steel erection and concrete bucket pouring.



Vortex lattice boom crane simulator prepares students for dual line operation with jib, clam shell, drag line and even pile driving operation.

Vortex Simulators Produce Real Skills

Vortex crane and heavy-equipment simulators lead the way in operator training with advanced physics-based behaviour, actual hand and foot controls, high-resolution 3D computer graphics, and accurate environmental effects like ambient sound, variable time-of-day and weather conditions. Trainers can load and control multiple construction work-sites, and provide novice through advanced students with a wide range of normal and abnormal work conditions, as well as skill-appropriate scenarios and tests. The simulators include multiple operator points of view, such as 360-degree perspectives and a bird's-eye viewport, for rich skills development and an enhanced training experience.

Unparalleled Equipment and Worksite Realism

The Vortex simulator environment features the robust Vortex physics engine, which faithfully reproduces the motion, lift, deformation, and handling characteristics of real equipment. This puts students in lifelike operational scenarios with accurate equipment behaviour and realistic interactions. The Vortex Mobile Crane, Tower Crane, Lattice Boom Crane, and Concrete Pump are based on industry-leading equipment. They simulate key crane and pump features and functionality – like engines, boom size and length, hydraulics systems, and outriggers – to deliver the highest degree of realism for effective operator training.

- ▶ **Vortex Tower Crane** integrates important characteristics such as rail-mounted or cruciform base, slewing gear with a slip-ring motor, and three-speed hoisting gears.
- ▶ **Vortex Mobile Crane** accurately simulates behaviour like the dynamics of the engine and hydraulic systems, outrigger usage, the back drive from the load, and the RPM-power curve of the engine under varying loads.
- ▶ **Vortex Lattice Boom Crane** provides highly realistic functionality such as dragline and clam-shell operations, pile-driving with an impact hammer, and working with an extra jib for advanced load placements.
- ▶ **Vortex Concrete Pump** fully models pump characteristics and concrete pour operations. It simulates a 32-meter boom truck, outrigger and boom operation, concrete pump and pouring of slabs and walls.

Six Incentives for Simulation-based Training

1 Safety.

Simulation-based training allows operators to train for both everyday and extraordinary situations. It is simply not practical to train operators how to react to a shifting load, unstable ground, high-winds or even the day-to-day operations of a busy large-scale worksite using real equipment. With simulation-based training, operators can practice the difficult situations and learn instinctively how to react when the unexpected happens.

2 Cost reduction.

Training skilled operators is a major investment. Simulators can train apprentices in basic skills and provide experienced operators with new ones at a fraction of the expense of actual equipment. Simulators won't replace seat-time in real equipment, but they can dramatically reduce the demands on training and production machines. They also allow training organizations to screen students before they start operating expensive heavy machinery.

3 Experience.

It is difficult to give apprentice operators the seat-time they need to understand the equipment and its limitations. Simulation-based training easily allows students to log hundreds of hours in a wide variety of situations at very little cost. It also allows senior operators to try different types of equipment or experience new situations. Simulators widen the range of operator experience and instill confidence in handling all situations.

Vortex Simulator Platforms - Scalable Solutions to Meet Every Training Need and Budget



VxSolo

The VxSolo Simulator provides training centers with a highly realistic, flexible and low-cost solution to prepare students for heavy-lift challenges in the construction industry. With the fully equipped and portable VxSolo, organizations have the proven features and authentic worksites to screen, test and build real skills. It can be configured to operate the Mobile, Tower or Lattice Boom crane simulation software. The highly affordable VxSolo features a rack-mounted computer, industrial controls, a wide-screen HD display and a rugged stand.



VxDuo

VxDuo extends the VxSolo design with a second display mounted above for mobile crane and below the main display for tower crane configurations. With the fully equipped and portable VxDuo, organizations have the proven features and authentic worksites to screen, test and build real skills. It can be configured to operate the Mobile, Tower or Lattice Boom crane simulation software. The second display can be re-configured within minutes to switch between mobile and tower operation. VxDuo can also be supplied with industrial seat and integrated controls.



VxMaster

The VxMaster Simulator provides a fully immersive and cost-effective solution for training centers to implement rigorous, standards-based heavy equipment training. It leads the industry with real crane models and controls, the renowned Vortex physics engine, high-resolution worksites, an Instructor's station and more, providing the ideal high-fidelity environment for building real operator skills.

VxMaster achieves stunning realism through four components: High-fidelity physics simulation; lifelike 3D graphics; authentic equipment and ambient sound; and actual industrial LCD, pedals and hand controls. VxMaster features a high-resolution graphics processor, multiple large HD displays and a sophisticated head-tracking system. The powerful Vortex physics engine perfectly duplicates key crane features and functionality – such as engines, boom size and length, hydraulics systems, and outriggers – to deliver the highest degree of realism for effective operator training.

Six Incentives for Simulation-based Training

4 Worksite efficiency.

Simulators not only help reduce training time, they can also produce more efficient operators. Novice operators have improved confidence and having repeated maneuvers more often, and even made mistakes more often, the result is efficient operations skills. This is particularly noticeable with new operators performing repetitive work in their first few months on the job.

5 Expanding capability.

Simulation-based training can help organizations broaden skills development for students. They can even help attract and retain new talent since they offer quick hands-on learning and feedback. Simulation is also an effective tool to keep skilled operators up-to-date or learn new methods and equipment.

6 Reduce maintenance.

Maintaining an up-to-date fleet of heavy equipment is costly. Even with the best training, students make mistakes and cause more wear and tear on expensive machinery. Simulators reduce maintenance costs and help reduce the demand on equipment resources. Through the use of simulators, students understand the machine and controls before they operate the equipment for the first time.

About Vortex

The Vortex team provides physics-based equipment and vehicle simulation solutions to companies and institutions throughout the real-time visual-simulation world. With a long history in the visual-simulation and gaming industries, the Vortex team produces feature-rich simulation tools that set the industry standard for interactive 3D dynamics and simulating mechanical equipment behaviour. Vortex expertise and technology put high-fidelity behaviour in motion in applications for training simulators, mission rehearsal, serious games, virtual prototyping and testing. Vortex customers include Honda, John Deere, L-3, Lockheed Martin, NASA, Carnegie Mellon University, and over 100 other leading companies and academic institutions.

Custom Simulation Systems

Vortex engineers, scientists, and simulation experts work with the world's leading developers and OEMs to deliver exceptional custom solutions ranging from complete turnkey simulators to specialized software components. Put Vortex expertise into your simulation project for proven high-fidelity behaviour and cost-effective results.

The Vortex team excels at translating project requirements and design specifications into tangible benefits. We build turnkey simulators for international training centres and equipment OEMs, produce accurate physics-based vehicles, machines, and robots for visual simulation projects, and implement cutting-edge hardware and control systems for many demanding customers. Vortex expertise, software technology and integrated components are used for virtual prototyping, operator training, mission rehearsals, and other crucial applications.



Vortex has been employed in port and off-shore crane simulators as well as countless other types of heavy equipment simulation.



The Vortex team has built a wide variety of immersive simulation environments using projection systems and high-definition displays together with cab-enclosures and OEM controls.

Customer Care

Vortex simulators are bundled with complete customer care packages that offer on-site installation, training, technical support and on-going simulator upgrades. Our complete care package will protect your investment by upgrading simulator software and maintaining hardware as well as provide on-site support.

behaviour in motion

