Simulation News

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Magazine about simulation based training tools

WELCOME TO THE WORLD OF SIMULATION

Tenstar Simulation offers a wide range of professional machine education simulators divided into three industrial segments. Construction, Transportation and Agriculture.

Simulation technology as a training tool is a proven concept in various professional fields. For example, surgeons, pilots and astronauts have already benefited from simulation based training for many years.

Tenstar simulators are developed by engineers in close cooperation with key players in the respective markets to create realism, professional machine feeling and realistic work scenarios.

Tenstar graphics are designed with an emphasis on real machine models and actual working environments. Each machine type has a set of carefully developed exercises, optimised to train the students in areas of maintenance, driving skills, maneuvering skills, safety and special accessories like GPS and tilt rotator.

NEW - Telescopic handler!

The telescopic handler is utilised on most sites today carrying out a wide array of tasks that are very often safety critical. With this in mind Tenstar Simulation is proud to announce the release of this machine to compliment the already wide range of other training machines available. With an impressive sixteen exercise scenarios to choose from the user can practice all elements of typical site situations. Starting from terminology where the student must learn and identify all parts of the machine before progressing onto pre start checks followed by basic machine manoeuvres.

Intuitive lessons on each of the machines functions and controls allows the operator to practice what each function does prior to engaging in more challenging tasks. Centres of mass and tipping points of the machine can be explored without the risk of injury or expensive damage to the machine and working environment. Different steering modes can be practised advancing to lifting loads with varying weights and dimensions. We have also created lifting platforms at various challenging heights that allow the student to practice everyday situations when loading out onto various structural openings.

Also available is a scenario where pallets have to be loaded and stacked on a flatbed lorry then unloaded and safely stacked on a designated site zone. Once the student is competent in all of the pre mentioned tasks a test can be conducted ensuring all the combined aspects of operating the telescopic handler have been understood and can be safely completed. The teacher also has separate exercise areas where they can define their own training routines.
With the ever increasing adoption of machine control grading systems on today’s construction sites, the need for quality training to enable the users to get the best from their investment has never been higher. It is not always practical to teach operators on the use of machine control once a construction site is in full production. This is where simulated training offers an efficient method to educate an operator on all aspects of the grading systems. During the simulation training the operator can fully focus on understanding every aspect of the grading system. Once on site with the machine no time is lost, the site benefits from the efficiency and cost savings which the machine control system delivers.

Benching, Laser and GPS methods are all available when using the system, this allows the student to decide when it is correct to use each method of measurement on site based on the application. For example a trenching application can use the laser 2D guidance solution whilst the highway construction uses the 3D GPS control. The system can also measure and record data for as-built purposes and/or design creation.

The trainer can be confident the machine operator has the ability to use the machine control system prior to going on to a live construction site. Users also have the option to load their own design files or use the pre-set design examples. Through very close working partnerships Tenstar Simulators will be fully compatible with industry leading machine control providers such as Trimble, Topcon, Leica and Novatron.

Simply by adding the chosen machine control providers screen interface to the simulator hardware the user has the ability to fully train as if installed on an actual machine.

**Virtual Reality**
Our simulators are VR-ready, prepared for the use of VR goggles and VR-functionality in most machines. Constantly adding new machines for the future.

**PROS:**
+ Increases the impression of realistic scenarios.
+ Saving space by replacing physical screens.
+ No locked angles, the user/student can look around freely.
+ Better depth perception.

**CONS:**
- In some situations the user can experience motion sickness.
- Prevents parallel real life visual communication.
- The teacher may not instruct as easily being shut out from the students vision.
- Does not work with all regular glasses.

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**Crane Lorry simulator**
Our Crane lorry simulator offers a full-scale training tool for the education of crane operators. The system provides a realistic environment with self-instructive exercises that reflect real-life machine behaviour including manoeuvring the lorry.

The Crane lorry simulator is made up of step-by-step sections, with different sequenced practical exercises, such as introduction of the crane lorry its functionality and operations. Excellent in training lifting and stability, lifting equipment as pallets and asymmetric loads. Continue with more extensive exercises by lifting boats, manoeuvring the lorry to the right position and so on. In order to increase the tension and learning, time challenge exercises are available. Use the follow up tool to experience the students progress.

At present you can choose between two different professional control units (Scanreco or Oldsberg). Both control units have unique functionality for its brand in compact format, ergonomic design and with user friendly interface.

**NEW!**
Scanreco control unit

**Head tracking**
Head tracking is used to determine in which direction the operators head is facing. It contributes to increased reality experience by adapting the field of view based on the operators movements. It allows the user to experience an immersive and more natural way to look around in virtual environments. All our simulators are prepared for the use of headtracking.
Tenstar Scoring System - TSS

Tenstar Scoring System provides performance-based scorecards and progress charts - focusing on Safety, Quality and Economy - enabling evaluation, feedback and incentive for student progress and development. The scorecard and progress charts allow the instructor to track each student’s development making it possible to give unique and personal instructions for every student. The Scoring System also enables real time feedback, to the student, ensuring continued and focused improvement in key areas.

- Individual feedback on performance score, helping students understand how to operate machinery in a safe, economic and high quality manner.
- Scorecards can record every time the student trains using the simulator, both students and instructors can follow progress and identify areas requiring improvements.
- Tenstar Scoring System measures a wide variety of data and metrics, which is often not traditionally possible.
- Examples of captured data - bucket height over the dump truck, speed near solid objects, fuel consumption and multi cylinder movements (hand-eye coordination).
- Stores student behaviours and actions (metrics) during an exercise and values those metrics by presenting a personal score for the exercise.
- Exercises have different metrics enabling specific and relevant scoring for the each scenario.

- Individual Customised Training can be applied per user limiting the use of certain machines/exercises and controlling progression to the next exercise, if the previous task was not completed correctly.
- Administrator reporting tool enables the teacher to pre load students details providing each user with a unique login identification.

Multi Machine Environment - MME

This is a groundbreaking feature in simulation as a training tool to prepare the student for the real interaction with other users, says Fredrik Alexandersson, senior developer at Tenstar Simulation.

Multi Machine Environment (MME) allows the user to network multiple simulator seats/machines into one site environment. An example of this can be seen in the road construction exercise where 360 tracked excavators work with articulated dump trucks delivering material to a dozer carrying out final trimming on the highway.

Multiple users can enter the environment making interactive cooperative training possible. This is currently available on tracked 360 excavator, articulated dump truck, counter balanced forklift truck, tractor and combine harvester. Now also adding forestry harvester and forwarder and constantly adding more machines.

Simulator cost is only 5 - 10 euro per hour

The operating cost of a simulator compared to a real machine is just a fraction in comparison. A simulator is a great addition to a real machine and an effective way to keep costs down. The cost is based on an average investment depreciated over 3-5 years with a usage of 6 hours a day, nine months of the year.

Basic skills can be learned without risking people and machines

Allows students to train in a safe, secure and relaxed environment that provides an effective learning. They can practice extreme situations and operations without risking injury and machine damage or downtime of machines.
Combination simulator
SEVERAL MACHINES IN ONE SIMULATOR

Tenstar Simulation offer the ability to combine multiple different machine types within the same simulator hardware providing the benefit of flexible and cost effective learning.

All our machines can be combined into one simulator station, offering a varied education criteria for the teacher. Switching between each machine takes minutes and does not require exchanging or switching control levers. Tenstar Simulation provide realism utilizing professional hardware together with life-like movement through our state-of-the-art fully user adjustable motion base unit.

SIMULATOR CENTER
- a venture to promote the growth of green nutrition

In Sweden, new high-tech educational environments at the Sötäsen, Uddetorp and Svenljunga Natural Sciences Schools have been opened. At both schools there are now a total of 34 simulators corresponding to approximately 400 machines where students can practice driving tractors, harvesters, forestry machines and other heavy equipment.

The simulation centers are an initiative to promote the growth and development of the green industry and will be used for both upper secondary and adult education.

The opening of the simulator centers at the Sötäsen and Uddetorp Natural Sciences Schools is a starting point for teaching in the simulator centers and a way to show others how digital technology can be used in school. The focus on simulators also helps to make the schools fossil-free by reducing greenhouse gas emissions from diesel consumption by approximately 1200 tonnes of CO2 eq.

www.naturbruk.se

Tenstar utilises the latest technology and are rapidly expanding in an exciting industry

Tenstar training simulators are developed using advanced programming combined with modern electronics and hardware including VR technology, professional machine components and motion platforms.

With our head office located in Sweden with a rapid growth strategy, we primarily focus on schools, education establishments, and machine manufacturers all over the world. We have an established sales organisation in Europe, and you will also find our customers in Africa, Asia, Japan, Australia and South America, our focus is global growth says Freddy Lund, CEO and owner of Tenstar Simulation.