PREPARE FOR REALITY

TRAFFIC SIMULATORS

TENSTAR simulation

LVE Learn Virtual Europe

WELCOME TO OUR WORLD OF SIMULATION

Tenstar want to contribute to reducing carbon dioxide emissions, optimise the learning experience and improve safety during and after driver education. We are the world leaders and use the latest technologies expanding rapidly across the globe. We offer simulators within Construction, Transportation and Agricultural industry sectors.

Within the transportation traffic sector, we offer car, bus, long hauler and truck with trailer. Also available are forklift, telescopic handler, timber crane truck, wheel loader and crane lorry. With Tenstar's traffic simulators we offer a safe and realistic environment for learning and improving skill sets.

In this environment, a teacher can work with several students at the same time. The exercises follow a step-by-step learning model where the driver develops from basic to advanced driving. The exercises are based on the industry's education plan to improve learning and increase the skills of the driver.

The students have the opportunity for individual training to learn the steps in order to be able to handle the vehicle safely in real scenarios as effectively as possible. The simulator also serves as an effective environment for testing new technologies and working methods, which leads to increased efficiency of the driver.

Fundamental to this is our analysis and reporting tool Tenstar Scoring System, several drivers in the same environment Multi Machine Environment, professional hardware and world-class graphics that make our simulators world-leading, a tool that prepares future drivers for reality.

Welcome to the present - and
future educational environment!

Freddy Lund,
CEO and Founder

WHY SIMULATION FOR TRAINING?

Improve students through increased and more efficient training hours

Simulation is a way to recreate a real situation in a safe controlled environment.
A simulator allows the user to experience an extensive effective training in a safe and secure manner. Low investment and a positive environmental impact are other great benefits.

Safety

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 resulting in downtime of machines.

Effective training

Simulators allow more students to practice on their own without the teacher's presence, regardless of season and weather. The teacher has access to students results and may subsequently monitor and evaluate student's work and skill in the reporting tool.

Investment and operation cost

The operating cost of a simulator compared to the cost of vehicles and recreating a traffic environment with other road users is nominal. It is often not practical or even possible to create typical real world situations during training.

Non-polluting

A simulator system has only 3% of the environmental impact of an actaul vehicle. Using simulators contributes to an improved environment while creating an attractive environmental profile for schools and organisations.

CAR

Tenstar software for car offers a full-scale training tool for car driver training that takes the user without prior knowledge through a step-by-step learning process based on the industry's education plan. World-class graphics, authentic features and driving characteristics creates a very realistic experience. The simulator is equipped with hanging pedals, manual or automatic gearbox, adjustable steering wheel and a three-point seat belt. The car simulator is VR compatible allowing the user to have an even higher level of immersive reality experience during driving.

Exercise description Car	
Initial manoeuvring	Starting and stopping
Shifting gears	Accelerating, braking and shifting gear
	Shifting gears
	Shifting gears, limited distance
Incline	Starting on a slope
Manoeuvring - reversing	Principles of reversing
	Reversing around corners
Manoeuvring	Space occupation
	Tight turns
	Parking
	Parking with other cars present
	Reverse parking
	Reverse parking, with other cars present
Braking	Acceleration, braking and reaction time
Urban environment	Roundabouts
	Roundabouts with traffic
Free practice	Skid pan
	Free practice-urban environment

Equipment - Simulator for Car
Mobile unit made in Sweden with or without motionbase
VR-ready
4 screens, 3 front and 1 rear, landscape, asymmetrically or symmetrically positioned
Adjustable steering wheel (self-developed)
Adjustable car seat with three-point seat belt
Gearbox, manual or automatic
3 hanging pedals or floor mounted
Options
Motionbase
Desktop solution
Headtracking
Transport box for simulator and/or screens
Dimensions
Installed: 2400x1600x1945mm
Transport box: 1200x800x1570 mm

BUS

Tenstar software for bus offers a full-scale training tool for bus driver training that takes the user without prior knowledge through a step-by-step learning process based on the industry's education plan. World-class graphics, authentic features and driving characteristics creates a very realistic experience. The simulator is equipped with hanging pedals, manual or automatic gearbox, adjustable steering wheel and a three-point seat belt. The bus simulator is VR compatible allowing the user to have an even higher level of immersive reality experience during driving.

Exercise description Bus	
Basic exercises	Start, Stop, Turning
	Reversing
	Turn at intersection
	Parking
City environment exercises	Maneuvering in city traffic with passengers
	Load/Unload passengers
	Following GPS
	Reacting and changing route
	Plan route

Equipment - Simulator for Bus
Mobile unit made in Sweden with or without motionbase
VR-ready
3 screens in front, landscape or portrait, asymmetrically or symmetrically positioned
Adjustable steering wheel (self-developed)
Adjustable car seat with three-point seat belt
Gearbox, manual or automatic 3 pedals
Options
Motionbase
Rearscreen
Desktop solution
Headtracking
Transport box for simulator and/or screens
Dimensions
Installed: 2400x1600x1945mm
Transport box: 1200x800x1570 mm

LONG HAULER

Tenstar software for long hauler offers a full-scale training tool for long hauler driver training that takes the user without prior knowledge through a step-by-step learning process based on the industry's education plan. World-class graphics, authentic features and driving characteristics creates a very realistic experience. The simulator is equipped with hanging pedals, manual or automatic gearbox, adjustable steering wheel and a three-point seat belt. The long hauler simulator is VR compatible allowing the user to have an even higher level of immersive reality experience during driving.

Exercise description Long Hauler	
Basic exercises	Introduction to vehicle
	Position the long hauler in
Driving with trailer	Coupling and decoupling
	Mirrors and blind spots
	Turning and positioning
	Obstacle course
	Turning on streets
	Reversing and turning
	Reversing into squares
	Reversing between cones
	Turning around in intersection
Demo	Comprehensive loading exercise

Equipment - Simulator for Long Hauler
Mobile unit made in Sweden with or without motionbase
VR-ready
3 screens in front, landscape or portrait, asymmetrically or symmetrically positioned
Adjustable steering wheel (self-developed)
Adjustable car seat with three-point seat belt
Gearbox, manual or automatic 3 pedals
Options
Motionbase
Rearscreen
Desktop solution
Headtracking
Transport box for simulator and/or screens
Dimensions
Installed: 2400x1600x1945mm
Transport box: 1200x800x1570 mm

TRUCK WITH TRAILER

Tenstar software for truck with trailer offers a full-scale training tool for truck driver training that takes the user without prior knowledge through a step-by-step learning process based on the industry's education plan. World-class graphics, authentic features and driving characteristics creates a very realistic experience. The simulator is equipped with exchangeable pedals, manual or automatic gearbox, adjustable steering wheel and a seat belt.

Exercise description Truck with trailer	
Introduction of truck	The truck's structure
	Maintenance
Exercises without trailer	Driving without trailer
	Unloading in an urban environment
	Unloading
	Transporting
Exercises with trailer	Slalom course
	Turn around and park
	Precisionreversing
	Reverse the truck with lateral movement
	Turn from start position
	Transport with trailer
	Reversing 45º with trailer
Eco driving	Basic Eco driving
	Long distance Eco driving
Competition exercises	Obstacle course
	Turn around and park
	Reversing through gates

Equipment - Simulator for Truck with trailer
Mobile unit made in Sweden with or without motionbase
3 screens in front, landscape or portrait, asymmetrically or symmetrically positioned
Adjustable steering wheel (self-developed)
Adjustable car seat with three-point seat belt
Gearbox, manual or automatic 3 pedals
Options
Motionbase
Rearscreen
Desktop solution
Headtracking
Transport box for simulator and/or screens
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Installed: 2400x1600x1945mm
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HARDWARE & OPTIONS

The hardware consists of several components made in Sweden engineered to the highest standards of quality. Chairs, armrests and controls are sourced from manufacturers from within the industry ensuring the highest level of realism when the user enters the simulator. The hardware is available in four different designs.

Car simulator

Mobile unit equipped with 4 screens, 3 front and 1 rear, landscape, asymmetrically or symmetrically positioned. Car seat with three-point seat belt, hanging pedals, gearbox and adjustable steering wheel (self-developed). Can also be delivered with motion base.

Traffic simulator

Mobile unit equipped with 4 screens, 3 front and 1 rear, landscape or portrait, asymmetrically or symmetrically positioned. Car seat with three-point seat belt, hanging pedals, gearbox and adjustable steering wheel (self-developed). Suited for car, bus, long hauler and truck with trailer. Can also be delivered with motion base.

STEERING WHEEL

Adjusteable steering wheel (self-developed).

GEARBOX

Manual and automatic gearbox.

HANGING PEDALS

Hanging pedals ensure a real experience.

FLOOR MOUNTED PEDALS

Exchangeable with hanging pedals.

Combination simulator

Suited for car, bus, long hauler and truck with trailer. Offers the unique opportunity to add joysticks enabling the user to train on all Tenstar machine types such as excavator, wheel loader, timber crane truck, tractor and forklift.

Desktop solution

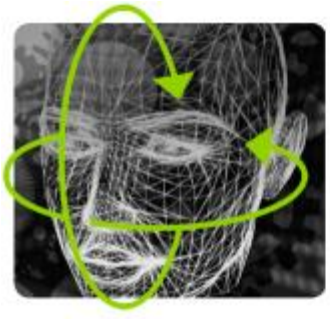
Can be used for car, bus, long hauler and truck with trailer. Possible to use with Tenstar adjustable steering wheel (self-developed) and pedals or gaming steering wheel with pedals.

MOTION BASE

Tenstar motion base is a 3 DOF (Degree Of Freedom) platform. Using advanced motion pattern technology which enhances the feeling of working in an actual vehicle. Can be added to all of Tenstar's machine types.

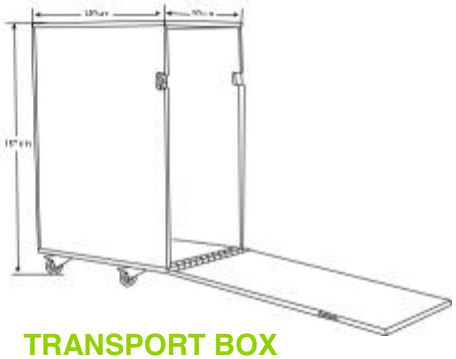
VR-READY

The simulator is VR-ready, which means that you can drive with VR glasses, this gives the opportunity to further enhance the real-world feeling of sitting in an actual vehicle.



HEAD TRACKING

Contributes to increased reality experience by adapting the field of view based on the driver's head movements.



TRANSPORT BOX

Our custom designed transport box facilitates safe movement. It is made in standard pallet size for easier handling. The box is made with a smart and practical solution to keep the parts all in place.

Width 80cm • Lenght 120cm • Height 157cm

MME - Multi Machine Environment

Several users in the same environment

MME - Multi Machine Environment , allows several users and machines, to work in the same environment promoting communication and teamwork. Adds a new layer of co-operative learning to simulation based training further preparing students for reality.

TSS - Tenstar Scoring System

Analysis - and reporting tool

TSS - Tenstar Scoring System, offers scoring results based on Safety, Quality and Economy. It enables evaluation, feedback and incentives for the student's progress and development. This allows the teacher to follow each student's development and provide personalised instructions. The scoring system enables real-time feedback to the student, which ensures continued and focused improvement in important areas. Students and teachers can review continued development over time and get help identifying areas that need further improvement.

TRR - Tenstar Record & Replay

Record driving and replay

TRR – Tenstar Record and Replay, is under development and will be completed in early 2020 and it can be updated online afterwards on existing simulators.
TRR provides a timeline function, it allows you to see where situations arise that differ from set criteria for example speeding, collision, or overtaking. It is possible to replay a situation in slow motion, stop it completely, all in 3D and with the possibility to rotate for the best viewpoint. Users can easily assess why a situation occurred and understand how it could be prevented. The teacher also gets a unique opportunity to record situations and show them in a way that a book or video can never do. The recording is stored in a small format, which previously was not possible, allowing many individual runs to be saved over a long period of time.

EYE TRACKING

Track where the student is looking

Eye tracking will be implemented in early 2020. By combining eye tracking with TRR, it is possible to gain a new perspective and a whole new understanding of how different situations play out. Eye tracking will be used to optimise learning and provide feedback to the student on how they used rear-view mirrors, identifies dangerous and fragile objects, and generally how the student plans their driving. Face recognition is possible and is used for automatic login and continuous user identification. There are currently two different eye tracking methods that are useful; camera on screen or glasses worn by the user.

Glasses worn by the user

Camera on screen

LEARN VIRTUAL EUROPE KFT

Táncsics M. 7

H-3200

GYÖNGYÖS

Ferenc Benus Jr.: +36 20/929-2026

Viktória Tóth: +36 70/289-4464

E-mail: info@learnvirtual.eu

Web: learnvirtual.eu

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LVE Learn Virtual Europe