



ANGRUP

DEFENCE AND SIMULATION

XV-TH03 SERIES

HEAVY VEHICLE DRIVER TRAINING SIMULATOR

XV-TH03 SERIES

XV-TH03 Series simulation systems have been developed using high technology and special equipment. Simulation systems equipped with real vehicle equipment (Otokar Kent) offer a wide range of software support. There is support hardware specially developed on the simulation system and offering high reality. The system gathers multiple heavy vehicle and bus simulation systems in one platform. With the simulator, you can easily train drivers of Trucks, Tandem trucks, school buses, military trucks, Fire Fighting Truck.

Specifications	Details
Hardware	Otokar Kent 290 LF
Software	Professional / CAN BUS Support
Visual System	3x55'' LED (1920 x 1080 Pixel Resolution)
Steering System	Force Feedback with Electric Servo Engine (1.5Kwa)
Pedals	Actual Vehicle Pedals (Gas,Brake,Clutch)
Shifter Systems	Manual (5F - 1R) and Automatic Transmission System
Camera System	720p (HD) Web Camera System
Sound System	Integrated 5.1 Surround System + Bluetooth Headset
Driver Seat	Multipoint Adjustable Driver Seat
Instrument Cluster	Digital Instrument cluster with full functionality(15.6'' FullHD) Changing instrument panel according to the selected vehicle
Motion Platform	3 DOF Motion System - 6'' Linear Actuator based haptic system
Transmission	Automatic and Manuel
Park Brake	Trailer & Park Brake
Instructor Station	RMT01 Series Multi Touch Screen Instructor Station
Body	Laser cut - Electrostatic Painted Chassis
Customization	Multifunctional Side Cockpit (Firetruck, Bus, School Bus, Tandem Truck Controls)
Recommended Space & Dimensions	15m ² <ul style="list-style-type: none">Width :350_{cm} / Length :350_{cm} /Height :220_{cm}Weight :800_{kg}
Electric Consumption	220V / 19.29 Amp



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FEATURES & APPLICATIONS

SUITABLE FOR PROFESSIONAL DRIVERS

3xLED SCREEN (5760x1080p)

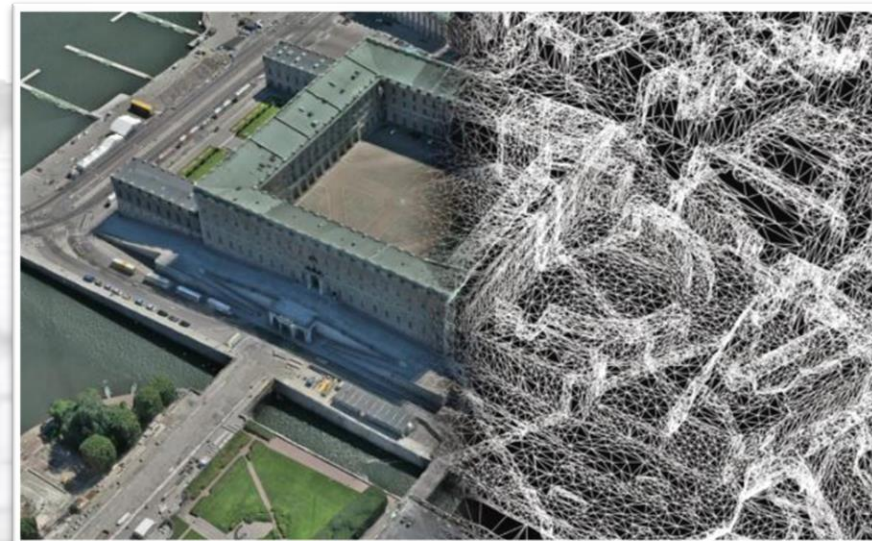
OTOKAR DRIVER COCKPIT

3 DOF MOTION PLATFORM

INSTRUCTOR STATION

DIGITAL INSTRUMENT CLUSTER

MANUAL GEARBOX



SOFTWARE

EDUCATION SCENARIOS

WEATHER SIMULATION

DAY / TIME SIMULATION

MULTI-LANGUAGE SUPPORT

THEORETICAL TEST SYSTEM

REPORTING & ANALYSIS SYSTEM

INTERACTIVE VIDEO AND TEST SYSTEM

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SPECIFICATION OF DRIVING SIMULATOR		
MAJOR COMPONENTS	SUB COMPONENTS	DESCRIPTION
1. MAIN COMPONENTS OF THE CABIN	BODY	Powder painted metal chassis
		Actual Heavy Vehicle Cockpit
		Right hand driving Support
MOTION PLATFORM	3 DOF Motion Platform	<ul style="list-style-type: none"> • D-BOX 6" Haptic System - 920 kg Payload • Maximum vertical lift: 6"/ 152,4 mm • Maximum velocity: ± 100 mm/sec • Maximum acceleration: ± 1 g-force • Frequency range: 0-100 Hz • Operating T° range: 0-40° C • Operating humidity: 10 to 75%
INSTRUMENT CLUSTER	Digital Instrument Cluster (15.6" - Full HD resolution)	<ul style="list-style-type: none"> • Speedometer • RPM • Air Pressure Gauge • Fuel Gauges • Temperature Gauges • Battery Indicator • Turn Signal Indicator • Warning Light Indicator • Low Beam Indicator • High Beam Indicator • Oil Indicator • Parking Brake Indicator • Air Tank Indicator (Air tank 1 & Air Tank 2) • Retarder On/Off Indicator • Gear Position • Front And Rear Fog Lamps Indicator • Fault Lamps • Driving Distance and Fuel Consumption



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VEHICLE PARTS BRAND: OTOKAR 290 LF PEDALS & SHIFTER

- Digital Instrument panel user menu selection over actual button
- Reverse driving camera system
- Trailer lock / unlock rear view camera system

Actual Heavy Vehicle Steering Wheel and Steering Wheel Plastic Cover

Turn Signal Lever and Headlight Switch (Signal Arm Automatic Shutdown) (Real Heavy Vehicle Component)

5 stage retarder arms (Real Heavy Vehicle Component)

Wiper Arm (Real Heavy Vehicle Component)

Ignition Key (Actual Heavy Vehicle Component)

5 forward and 1 reverse manual transmission.

- The simulator has a physical gear system. The manual transmission system integrated with the clutch.

8 forward and 1 reverse automatic transmission.

Automatic gear has physical control buttons (P, D, N, R,1,2,3) over cockpit

- Automatic gear system buttons have led indicator over itself

Parking Arm

- Real heavy vehicle parking brake with lock system.
- reverse stage and forward stage with lock.
- Actual Heavy vehicle equipment.

Electronically controlled air assisted real truck driver seat

- Pneumatic suspension with automatic weight adjustment
- Fore and aft adjustment
- Seat cushion depth adjustment
- Seat tilt adjustment
- Lumbar adjustment
- Height adjustment
- Fully foldable backrest for ease of access
- Backrest adjustment

3-point seat belt integrated in the driver's seat

Rear Fog Switch (Real Heavy Vehicle Component)

Retarder Switch (Real Heavy Vehicle Component)

Hazard Warning Switch (Real Heavy Vehicle Component)

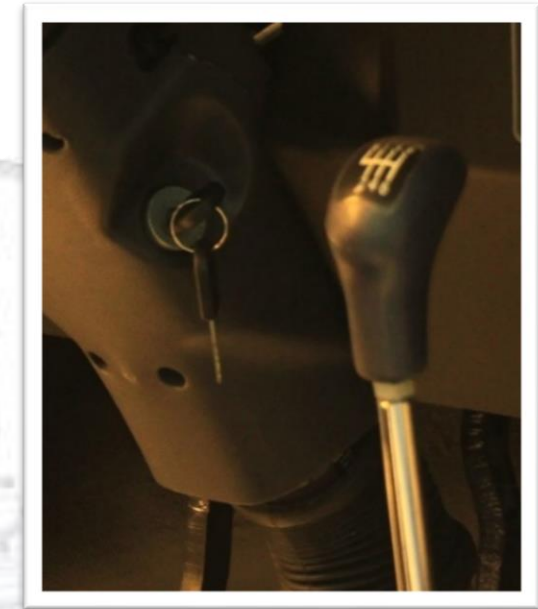
Eco/Powerful Drive Mode Switch (Real Heavy Vehicle Component)

ASR On-Off Switch (Real Heavy Vehicle Component)



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		Horn Button (Real Heavy Vehicle Component)
		Horn Change Button (inner city or out of town) (Real Heavy Vehicle Component)
		Mirror Adjustment Button (Real Heavy Vehicle Component) (Right-Left Mirror Selection 4-Way Movement)
		Air lock & Trailer lock simulation with mechanical equipment's
PEDALS & SHIFTER		Accelerator Pedal <ul style="list-style-type: none"> • Heavy vehicle equipment • Linear potentiometer based real heavy vehicle floor accelerator pedal • The accelerator pedal should work from the base. • Mechanical Travel: $17.5 \pm 2^\circ$ • Operating Temperature: $-40\text{ }^\circ\text{C} \sim +85\text{ }^\circ\text{C}$
		Brake Pedal <ul style="list-style-type: none"> • Linear potentiometer based real heavy vehicle floor brake pedal • Actual truck pedal dimensions • Sensor temperature range ($-40\text{ }^\circ\text{C} / +120\text{ }^\circ\text{C}$) • Brake Sensor Maximum operational speed 120 RPM • Brake Sensor Torque 0.2 (IP54) Ncm • Brake Sensor Maximum shaft loading (axial and radial) static or dynamic force): 20N
		Clutch Pedal <ul style="list-style-type: none"> • Actual truck pedal dimensions • Real heavy vehicle suspended clutch pedal • Clutch Sensor temperature range: ($-40\text{ }^\circ\text{C} / +120\text{ }^\circ\text{C}$) • Clutch Sensor Maximum operational speed: 120 RPM • Clutch Sensor Torque should be 0.2 (IP54) Ncm • Clutch Sensor Maximum shaft loading (axial and radial) static or dynamic force) : 20N • Clutch pedal has mechanical lock via gearbox • Driver cannot shift gear without press clutch pedal • Linear potentiometer based real heavy vehicle floor clutch pedal
		If the vehicle is used as an automatic transmission, the clutch pedal can hide automatically. This operation is done via a single control button. The control button has a light indicator and placed on instructor station



Instrument Cluster - 15.6'' Full HD Resolution



- Digital Instrument cluster with full functionality
 - Analog style RPM, Speedometer, Fuel and Oil indicators
 - Analog and digital style air Tank indicators
 - Reverse view camera system for tandem trucks
 - Gear indicators
 - Air tank simulation
 - Cargo Lock / Unlock indicators
 - Door indicators
 - Warnings
-
- Digital / Analog Image, Km/h - Mph can select
 - Digital / Analog Image can select
 - Vehicle Computer can select

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MAJOR COMPONENTS	SUB COMPONENTS	DESCRIPTION
1. MAIN COMPONENTS OF THE CABIN	IOS PANEL	Connector & Power Buttons <ul style="list-style-type: none"> • USB Plug • On/Off Switch • Ethernet Socket • Power Button • Emergency Stop Button • Transmission Switch Button (for manual to auto)
		Display <ul style="list-style-type: none"> • 1x21.5" Led Multi-Touch Screen 1920x1080p Resolution
	VISUAL SYSTEM & SOUND SYSTEM	Panels <ul style="list-style-type: none"> • Electric & Electronic Control Panel
		3xLED Screen 5760x1080p Resolution <ul style="list-style-type: none"> • 55" LED Screen (Center) • 55" LED Screen (Left) • 55" LED Screen (Right) • 3 Screen Monitor Holder System • 5.1 Surround Sound System
	CAMERA SYSTEM	720p (HD) Web Camera System <ul style="list-style-type: none"> • Web Camera for Verification of Participants
	SIMULATOR PC	CPU: Intel i7 9700K
		CPU Cooling: 240 mm Liquid Cooling
		Mainboard: Intel Z390 Chipset
		RAM: 32GB 3200 MHz DDR4
Graphics Card: NVIDIA Chipset 8GB		
HARDDISK 1 / SSD: 240 GB		
HARDDISK 2 / HDD: 1 TB		
OS: Windows 10 64+		
Power: 850W 80+		
Computer Case: ATX Tower		
POWER & TEMP	AC 220V, 50-60Hz & -10 / +35 C	
	<ul style="list-style-type: none"> • Audible seat belt warning • Audible air tank level warning & simulation • Audible traffic violation warning 	



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	AUDIBLE ALERTS	<ul style="list-style-type: none"> • Audible reverse driver warning • Overturning of the cargo warning • Engine temperature warning
	AMBIENT LIGHT	<ul style="list-style-type: none"> • ANGRUP Light Control Box • ANGRUP Light Control Electronic Unit • Ambient light changes automatically depending on the simulation weather conditions (Sunny, Rainy, Snowy, Foggy, Day, Night, Windy)



Preoperation Trainings

Vehicle Controls Recognition

Vehicle Starting

Speed Control

Turn Left & Right

Speed Bump

Basic Driving

Follow line

Breaking

Driving Education Area

Basic Driving Training

Change Line

RoundAbout

U Turn

Urban Roads

Curved Road

Highways

Highways (Night)

Urban Road (Night)

Curved Road (Night)

Intermediate Driving Training

Highway with weather con (day)

Urban with weather con.(day)

Highway with weather con (night)

Urban with weather con.(night)

Offroad

Collision Avoidance Trainings

Hazard Perception

Avoiding objects on the Road

Parking Trainings

L Parking Forward

Reverse Parking

Parallel Parking

Psychotechnical Tests

Hand foot coordination test

Sound perception test

Eye perception test

Steering reflex test

Pedal reflex test

Visual and auditory perception test

Inverse perception reflex test

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2. STEERING SYSTEM	STEERING	Force Feedback with Electric Servo Engine (1.5Kwa)
		Steering System Mechanical Lap Lock
		Auto Calibration
		2 Cycle Left / 2 Cycle Right
		Steering System Control Methods <ul style="list-style-type: none"> • Torque Control • Speed Control • Position Control
		Communication Protocol / Ports <ul style="list-style-type: none"> • Rs485 Communication Port • Modbus Protocol • CAN Communication Port • Can Open D402 Protocol
		Specifications <ul style="list-style-type: none"> • Rated Torque: 7.16 Nm • Instantaneous Torque Peak Value: 21.5 Nm • Incremental Encoder, 10000 P/R
3. ELECTRONIC CARDS	COMMUNICATION AND WORKING RANGES	Protective Measures <ul style="list-style-type: none"> • Over Voltage • Over Current • Under Voltage • Overload • Regenerative Fault • Over Speed
		Vibration Support
		Electronic Communication Via Can Bus Protocol
		0 / +45 Operating Temperature (Without Frosting)
		Can Work With +24v Or Less Voltage
		Not Affected By Electronic Noise
		Module Can Be Added For Aftermarket Signal Needs
Diagnostic Software		
Driver Software Can Be Updated		



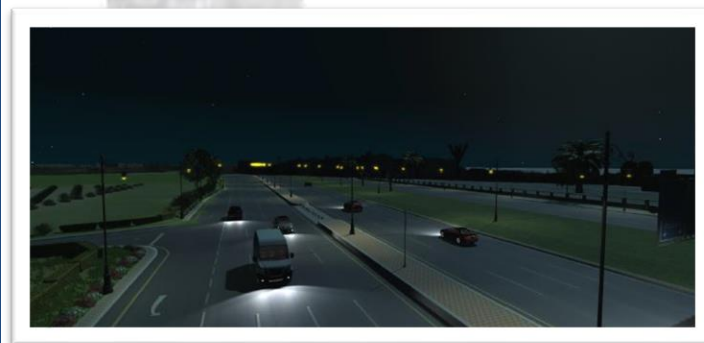
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XV-TH03 SERIES SOFTWARE SPECIFICATION	
	DESCRIPTION
SIMULATION SOFTWARE	VEHICLE <ul style="list-style-type: none"> • Truck • Truck with cargo • Truck with liquid cargo • Tandem Truck • Double Tandem Truck
	TRAINING SCENARIOS <ul style="list-style-type: none"> • Control Recognition scenario • Control Recognition - Pedal scenario • Control Recognition - Gear scenario • Speed Control scenario • Right-Left Turn • Speed Bump • Simple Driving • Line Tracking • Braking Training • Traffic Closed Area • Reverse Driving • Allowing Pedestrians • Overtaking Vehicle • Traffic Signs education • Lane Change • Roundabout • U-Turn • Urban Road scenario 1 • Urban Road scenario 2 • Curvy Road • Foggy Road • Off-road • Icy Road • Snowy Road • Sloping road • Forward Park



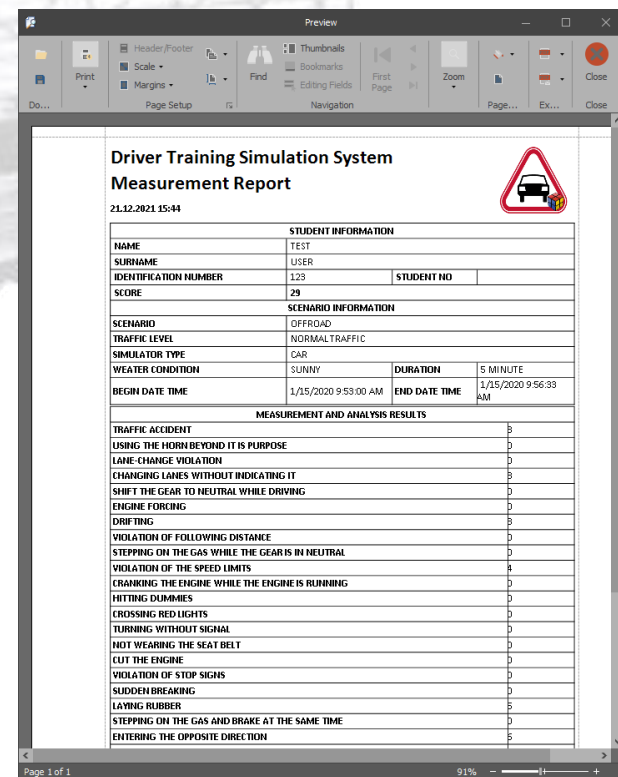
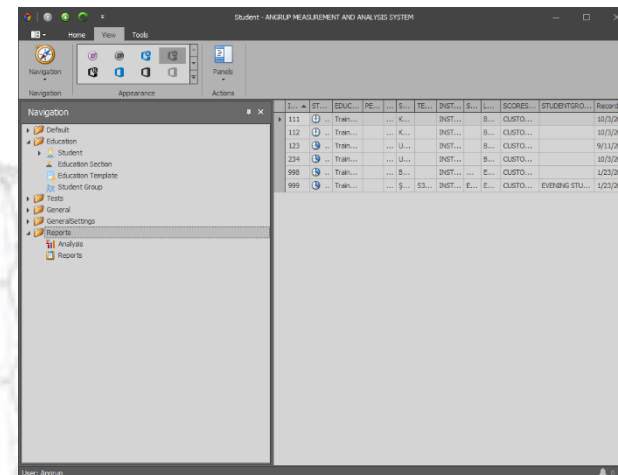
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		<ul style="list-style-type: none"> • Reverse Park • Parallel Parking • Speed Track • Driving Education Area
	<p>PSYCHOTECHNICAL TESTS</p>	<ul style="list-style-type: none"> • Brake Detection Test • Gas Detection Test • Left Escape Test • Right Escape Test • Eye Perception Test • Response Perception Test • Hand and Foot Test 1 • Hand and Foot Test 2 • Hand and Foot Test 3
	<p>VIDEO EDUCATION</p>	<ul style="list-style-type: none"> • Basic Narration • Adjusting Mirrors • Seat Adjustment • Seat Belt Fastening and Adjusting • Understanding the Car • Parking / Reversing • Introduction to Parking Lot / Lane Positioning • Parking / Surrounding Scan • Parking / Stopping and Starting • Residential / Controlled Intersections • Residential / Flat Driving • Residential / Hazard Detection • Entering and Exiting Commercial Roads / Parking Lots • Awareness of Commercial Ways / Risks • Commercial Road / Crosswalk Intersections • Commercial Road / Multi Parking Lot • Responding to Commercial Roads / Other Drivers • Commercial Road / Four-Sided Space Spacing • Commercial Road / Speed Management



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		<ul style="list-style-type: none"> • Waiting for Other People's Behavior on Highways / Autobahn • Disruptions in Highways / Highway Traffic • Highways / Entry and Exit • Lane Change on Highways / Autobahn • Highways / Blind Spots Monitoring • Highways / Signs - Navigation • Highways / Six Seconds Rule - Bumper Gap • Highways / Speed Management • Staying Out of Highways / Blind Spots • Passing on Country Roads / Other Vehicles • Country Roads / Speed Management • Night Driving • Driving in Bad Weather Conditions • Managing Distracting Objects • Route Planning and Directions • Potential Hazards in Any Environment
	<p>WEATHER CONDITION</p>	<ul style="list-style-type: none"> • Sunny • Rainy • Snowy • Foggy • Day / Night • Windy
	<p>TRAFFIC CONDITION</p>	<ul style="list-style-type: none"> • No Traffic • Low Traffic • Normal Traffic • Busy Traffic
	<p>SIMULATION DETAILS</p>	<p>Instructor can select vehicle transmission type</p> <p>Instructor can Reset vehicle position re-play system</p> <p>Driver camera FoV (Field of view) control simulation</p> <p>Sun Intensity simulation</p> <p>hidden-ice simulation</p> <p>Fog Intensity simulation</p> <p>Real time simulation monitoring with different</p>



ANGRUP CORP.

HEADQUARTER

Address: Araylar Sanayi Sitesi A35
Tuzla/ISTANBUL 34959 TURKEY

Tel: +90 216 304 20 47

Fax: +90 216 304 10 57

Gsm: +90 530 416 56 33

ANGRUP GERMANY

Ang Technologies Munich GmbH
Gründung Luitpolstr. 62 84034 Landshut DEUTSCHLAND

Mail: info@angrup.net

Web: www.angrup.net



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