HUMANETICS

ACTIVE SAFETY

PRODUCT PORTFOLIO


UPGRADE
YOUR ADAS/AV
TESTING

HUMANETICS

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ULTRA-FLAT OVERRUNABLE TARGET CARRIERS

The first UFO target carrier was introduced to the market in 2010 when a German OEM and Tier 1 supplier requested a low-maintenance, overrunable target carrier for active safety testing.

The electrically-driven UFO target carriers can be controlled remotely by an operator or synchronized with vehicles as well as other test robots to execute various autonomous test maneuvers. The stability and low profile of the UFOs allows vehicle manufacturers to run fully autonomous tests on the latest collision mitigation features with maximum accuracy and repeatability, and without risking damage to the robots or test vehicles.

Efficiency and ease-of-use were core philosophies for subsequent hardware and software development. All Humanetics active safety robots are designed with hot swappable batteries allowing uninterrupted testing on the proving ground. A variety of targets can be utilized with the various UFO models, delivering tailored test conditions for each specific use case.

UFOmicro® Target Carrier[1]

Designed to cover realistic PTW test scenarios with a speed of up to 90 km/h while having great stability.

UFOnano® Target Carrier[2]

Designed to cover VRU test scenarios with the smallest footprint and turn-on-the-spot function.

UFOpro® Target Carrier[3]

Can be used with GVT or VRU target with a speed of up to 100 km/h to mimic real life traffic scenarios.

[1] The UFOmicro® Target Carrier hereinafter is referred to as UFOmicro®. [2] The UFOnano® Target Carrier hereinafter is referred to as UFOnano®. [3] The UFOpro® Target Carrier hereinafter is referred to as UFOpro®.

DRIVINGROBOTS

Driving robots designed to test Advanced Driver Assistance Systems (ADAS) are sophisticated tools used to evaluate and validate the functionality and safety of these systems. These robots can execute various driving scenarios with high precision and repeatability, which is crucial for thorough testing and development of ADAS technologies.

Our DrivingRobot compact (DRc™) is the traditional choice for passenger vehicle tests, offering unparalleled control and high repeatability to ensure the robustness of safety features. The DrivingRobot modular (DRm) extends this precision to a wider range of vehicles, including heavy goods vehicles, buses, and caravans. DRm also provides the ability to install only the necessary robots required for your testing. This flexibility makes the DRm an indispensable tool for diverse testing needs.

Both models execute various driving scenarios with high fidelity, enhancing the accuracy of ADAS testing and ensuring these systems perform reliably in real-world conditions.

Their user-friendly design simplifies integration and setup, reducing downtime between tests and increasing overall efficiency.

DrivingRobot Compact

DRc™ can be installed in all available passenger cars, offering precise, repeatable performance on the test track – in a compact, ergonomic design.

DrivingRobot Modular

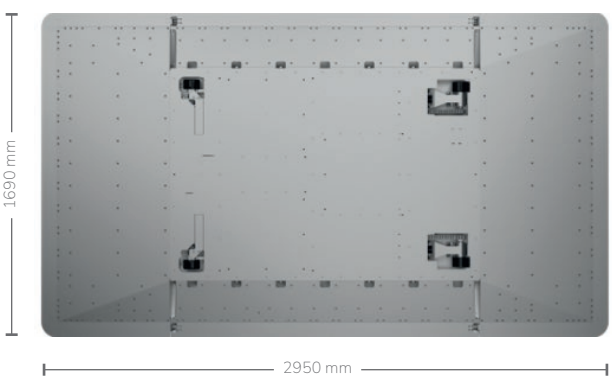
The DRm is available in a DRm60™ version for passenger cars as well as a DRm150™ version for larger vehicles such as trucks.

UFOpro®
TARGET CARRIER

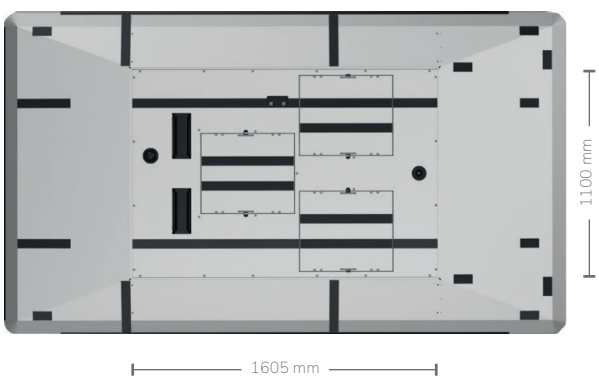
KEY FEATURES

- **Low overrun height of 98 mm** – to be overrun/ over-braked by a vehicle without damaging the vehicle or the target carrier
- Quick and simple access to all internal components with a **single central cover plate** which can be easily removed with just a few screws
- **Hot swappable batteries** to continuously run high speed tests (i.e. Euro NCAP lane support system tests) with zero downtime for recharge; this feature also enables replacement batteries to be charged while other battery sets are active, allowing us to extend battery life and ease of transportation by UN38.3 certification
- **Removable ramps** simplify transportation and storage by reducing the overall size and weight of the target carrier, which can be easily transported with any standard minivan-sized vehicle
- **100% splash water protection system** allows for testing in adverse weather conditions (e.g. muddy, wet, salty) and minimizes maintenance effort and cost
- Designed to enable **fast wheel changes**
- **Screw-less, welded ramp system** for reduced Radar Cross Section (RCS)
- **Stable 4-wheel chassis** for **minimized rolling** of the target in dynamic lateral motions (e.g. wind suction/ slipstream during overtaking)
- **Designated official tool by Euro NCAP laboratories** (e.g. ADAC, AstaZero, CSI, Thatcham)
- Global Vehicle Target (GVT) and UFO Target Carrier have been **confirmed by Euro NCAP/NHTSA/IIHS** workshops as being in accordance with required standards
- Several standard safety functions ensure safety of operators; optional add-ons such as **proving ground warning lights and monitoring systems** can be integrated into the UFO product family

BOTTOM VIEW



TOP VIEW



Scan to see the UFOpro® target carrier in action.

UFOpro® TARGET CARRIER

UFOpro® TARGET CARRIER

The UFOpro® is the default version of the UFO; with its low overrun height of 98 mm and hot swappable batteries, it is designed for Euro NCAP ADAS testing. The UFOpro® is available with an optional ABS system, as well as a Heavy Duty version with reinforced ramps and batteries, allowing it to be overrun by commercial vehicles up to 40 tonnes. An additional set of batteries can be purchased separately.

UFOpro BLACKSERIES TARGET CARRIER

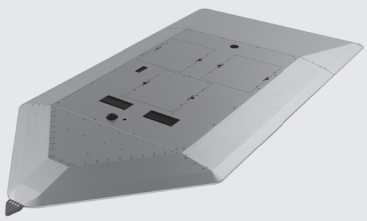
With a maximum speed of 100 km/h including a GVT target, the UFOpro BlackSeries[1] is a step up from the UFOpro. It has an increased gear ratio as well as a specific control algorithm for high speeds. Like all UFOs, the UFOpro BlackSeries is available with an optional ABS system. Both the UFOpro BlackSeries and the UFOpro® share a similar mechanical design, so that a UFOpro can easily be upgraded to an UFOpro BlackSeries.

[1] The designated hereinafter referred to as UFOpro *BlackSeries*, is describing UFOpro *BlackSeries* target carrier

Arrow Ramps

Can be swapped with standard front ramp for side impact testing of cars.

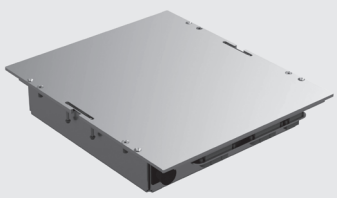
See the Arrow Ramps in action.



Additional Lithium Power Pack

Extra power pack allows ongoing testing without downtime for charging batteries.

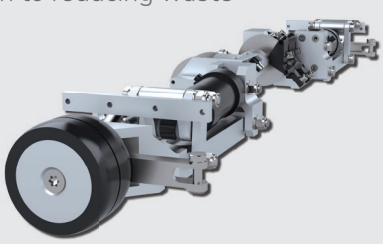
See the fast and easy battery swap.



Anti-Lock Braking System (ABS)

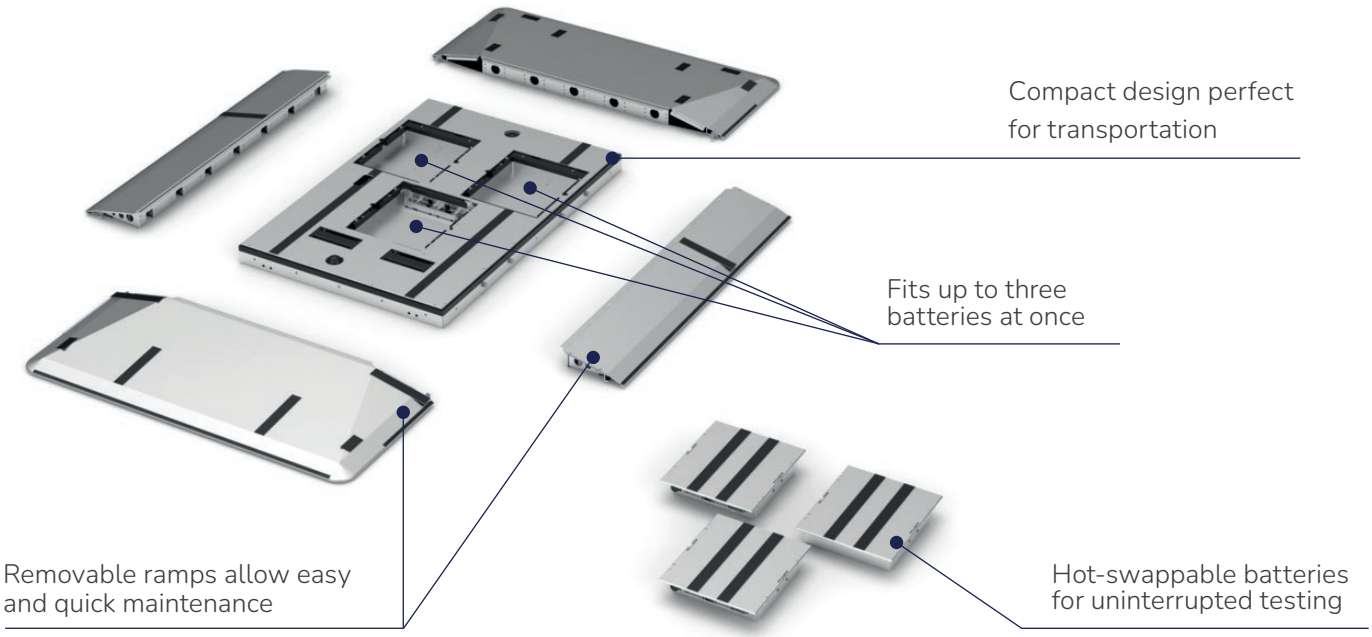
The UFO platform's ABS extends tire life, saving time and money in addition to reducing waste

See the ABS in action.



UFOpro® TARGET CARRIER

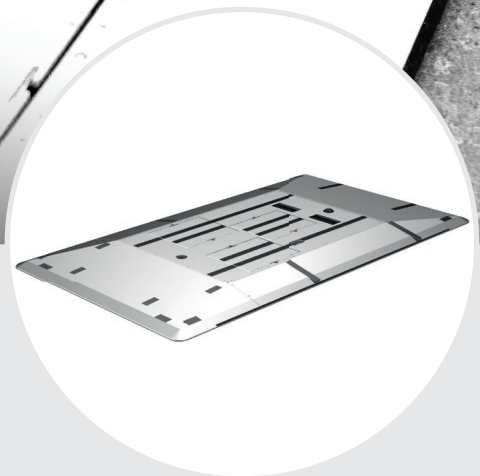
DESIGN OVERVIEW



SPECIFICATIONS

DIMENSIONS	Transportation Size	1605 x 1100 mm
	Test Ready Size	2950 x 1690 mm
	Chassis Height	98 mm
	Test Ready Weight	244 kg (Standard) / 264 kg (*BlackSeries*)
	Payload	125 kg
	Overrun Capacity	45 tons (Heavy-Duty)
	Clearance	15 mm
DYNAMICS	Maximum Speed Forward	80 km/h (Standard) / 100 km/h (*BlackSeries*)
	Maximum Speed Backward	20 km/h
	Maximum Longitudinal Acceleration	1.8 m/s² (Standard) / 1.4 m/s² (*BlackSeries*)
	Maximum Longitudinal Deceleration	6 m/s²
	Maximum Lateral Acceleration	1.5 m/s²
	Minimum Turning radius	6 m at 5 km/h

UFOpro®
TARGET CARRIER



SPECIFICATIONS

ENERGY	Batteries Included	2 (Standard) / 3 (*BlackSeries*)
	Chargers Included	2 (Standard) / 3 (*BlackSeries*)
	Battery Technology	Lithium Iron Phosphate (LiFePO4)
	Battery Capacity	2048 Wh (Standard) / 3072 Wh (*BlackSeries*)
	Voltage	51.2
	Battery Slots	3
	Battery Swapping Time	2 minutes (hot swappable)
	Battery Set Charging Time	90 minutes
	Battery Life Time (common NCAP Testing)	Full testing day (up to 60-80 NCAP scenarios)
ACCURACY	Speed Control Accuracy	0.2 km/h
	Speed Measurement Accuracy	0.05 km/h
	Side Control Accuracy	50 mm
	Yaw Rate	+/- 1 deg/s
	Accuracy	in line with ISO 19206-7
	GNSS Unit Oxford	OEM3000v3
	GNSS Unit SBG	-
AREA OF APPLICATION	Radar Cross-section	in line with ISO 19206-3
	Drive-over Capacity	Passenger vehicles Commercial vehicles Heavy Duty vehicles
	Targets (main use)	Passenger Vehicle 3D Target REF. F & G
CONDITIONS	Operation Temperature Range	-10° C to 50°C
	IP Rating	IP66
	Relative Humidity Range	0%-95%, not condensing
	Recommended Storage Temperature	5° C to 25° C

The UFOpro® supports the following scenarios

- Automatic Emergency Brake - Car-to-Car (AEB-C2C)
- Forward Collision Warning - Car-to-Car (FCW-C2C)
- Emergency Lane Keeping (ELK) (oncoming-overtaking)
- Automatic Emergency Steering (AES)
- Emergency Steering Support (ESS)
- Rear Automatic Braking
- Blind Spot Detection
- Blind Spot Intervention
- Intersection Safety Assist
- Opposing Traffic Safety Assist
- Traffic Jam Assist

....and many more scenarios thanks to the flexibility of our Trajectory Generator Software.

UFOmicro® TARGET CARRIER

The UFOmicro® target carrier is developed specifically for PTW (Powered Two Wheeler) and VRU (Vulnerable Road User) tests.

To cover realistic road traffic conditions and behavior of road users, the UFOmicro® can reach a speed of up to 90 km/h carrying a wide range of targets and can be used for heavy duty tests. With its mountable extension, it can carry bicycle and different pedestrian VRU targets with no effort.

The UFOmicro® can be seamlessly integrated into any already existing Humanetics UFObase software environment. Configuring and testing complex real-world scenarios with up to ten robots can be accomplished easily due to seamless synchronization.

To maximize reliability and repeatability, the **UFOmicro®** was designed to maintain extremely precise accuracies in both the lateral and longitudinal directions during testing.

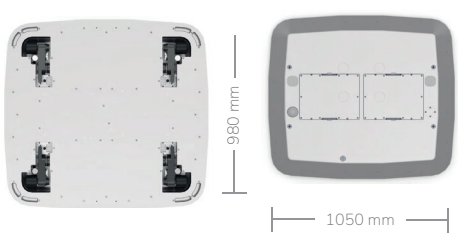
Radar measurements have been conducted to confirm the extremely low radar signature of the stealth design.

The target carrier is equipped with multiple motion data input and output interfaces and a highly accurate dual antenna DGNSS system.

As with the all other Humanetics UFO models, the UFOmicro® is overrunable and has the advantage of high-capacity, swappable batteries.

The VRU Extension allows VRU targets to be mounted for testing at 25mm above the ground, in accordance with ENCAP regulations. The PTW extension is used to increase stability for high speed tests.

UFOmicro® with PTW target



Dimension of UFOmicro®

UFOmicro® with Pedestrian Adult target

Scan to see the UFOmicro® target carrier in action.

UFOmicro® TARGET CARRIER

SPECIFICATIONS

DIMENSIONS	Transportation Size	1050 x 980 mm
	Test Ready Size	1050 x 980 mm
	Chassis Height	70 mm
	Test Ready Weight	85 kg
	Overrun Capacity	45 tons
	Clearance	15 mm
DYNAMICS	Maximum Speed Forward	90 km/h
	Maximum Longitudinal Acceleration	4 m/s²
	Maximum Longitudinal Deceleration	6 m/s²
	Maximum Lateral Acceleration	3 m/s²
	Minimum Turning Radius	3,5 m at 10 km/h
ENERGY	Batteries Included	2
	Battery Technology	Lithium Iron Phosphate (LiFePO4)
	Battery Slots	2
	Battery Swapping Time	2 minutes (hot swappable)
	Battery Set Charging Time	25 minutes
	Battery Life Time (common NCAP Testing)	Half testing day
GNSS	Accuracy	in line with ISO 19206-7
	GNSS Unit Oxford	OEM1000v2
	GNSS Unit SBG	Ellipse-D
AREA OF APPLICATION	Radar Cross-section	in line with ISO 19206-9 / 19206-5 / ISO 19206-4 / ISO 19206-2
	Drive-over Capacity	Passenger Vehicles Commercial Vehicles Heavy Duty Vehicles
	Targets (main use)	European Motorcycle (EMT) E-Scooter CNCAP Target (PTW) Pedestrian Adult Target Articulation (EPTa) Pedestrian Child Target Articulation (EPTc) Bicyclist Adult Target (EBTa) Bicyclist Child Target (EBTc) Playing Child Target (PCT) Standing Scooter Target (SST)
CONDITIONS	Operation Temperature Range	-10° C to 50° C
	IP Rating	IP66
	Relative Humidity Range	0%-95%, not condensing
	Recommended Storage Temperature	5° C to 25° C

KEY FEATURES

- Hot swappable batteries
- Speeds up to 90 km/h
- Weather resistance due to waterproof design
- Special stealth shell design for optimized radar signature
- Highly accurate dual antenna RTK DGNSS system
- Compatible with a large variety of targets and multiple extension options
- Milled from a solid aluminum block for efficient cooling and high-temperature operation

UFOmicro®
TARGET CARRIER

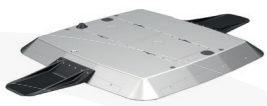
UFOmicro® – TARGET OPTIONS

European Motorcycle Target & Stands[1]

(UFO-1-5140)

E-Scooter CNCAP Target[1]

(UFO-1-5150)



European Motorcycle Target & Stands[1]

(UFO-1-5140)

E-Scooter CNCAP Target[1]

(UFO-1-5150)

Playing Child Target (PCT)[2]

(UFO-1-5180)

Standing Scooter Target (SST)[2]

(UFO-1-5190)

Bicyclist Child Target (EBTc)[1]

(UFO-1-5035)

Pedestrian Child Target Articualtion (EPTc)[1]

(UFO-1-5070)

Pedestrian Adult Target Articualtion (EPTa)[1]

(UFO-1-5050)

Bicyclist Adult Target (EBTa)[2]

(UFO-1-5030)

Icon designates targets that are Euro NCAP approved with the UROmicro®.

[1] Image 4activeSystems GmbH
[2] Image Messring GmbH


HUMANETICS

UFOnano®
TARGET CARRIER

The UFOnano® target carrier was developed specifically for pedestrian and bicycle testing. Its unique 2+2-wheeler design enables highly agile movements of pedestrian and bicycle targets, enabling it to simulate complex and realistic scenarios for VRU active safety system tests.

The split design enables the placement of the target with a height of only 25mm. Despite the reduced size of the **UFOnano®**, it retains the same robustness as the other UFO target carrier models for added stability, especially in windy conditions.

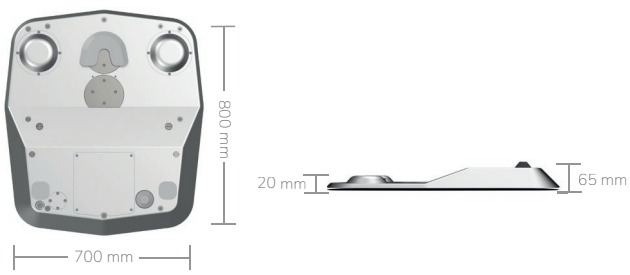
This versatile new device features the same familiar design as the Humanetics UFOpro® target carrier, however its compact size and steering setup allows it to drive curves of every radius and even turn on the spot.

It can easily accommodate a pedestrian test target with a shoulder width footprint barely larger than that of a real person, allowing multiple dummies to 'swarm' together with the closest shoulder-to-shoulder distances on the market, while mimicking individualized behavior.

Its modern stealth design featuring a sleek, robust metal surface makes the **UFOnano®** invisible to the test vehicle's radar – a necessity for maintaining realistic test conditions.

UFOnano® with Pedestrian Adult target

UFOnano® with Playing Child target



Dimension of UFOnano®

See the UFOnano® target carrier in action.

UFOnano®
TARGET CARRIER

SPECIFICATIONS

DIMENSIONS	Transportation Size	700 x 800 mm
	Test Ready Size	700 x 800 mm
	Chassis Height	15 - 65 mm
	Test Ready Weight	25 kg
	Overrun Capacity	45 tons
	Clearance	10 mm
DYNAMICS	Maximum Speed Forward	20 km/h
	Maximum Longitudinal Acceleration	2 m/s^2
	Maximum Longitudinal Deceleration	3 m/s^2
	Maximum Lateral Acceleration	1.5 m/s^2
	Minimum Turning radius	0 m (turn on spot)
ENERGY	Batteries Included	4
	Battery Technology	Lithium Ion
	Battery Slots	2
	Battery Swapping Time	2 minutes (hot swappable)
	Battery Set Charging Time	90 minutes
	Battery Life Time (common NCAP Testing)	Half testing day (up to 30 NCAP scenarios)
ACCURACY	Speed Control Accuracy	0.2 km/h
	Speed Measurement Accuracy	0.05 km/h
	Accuracy	in line with ISO 19206-7
	GNSS Unit Oxford	OEM1000v2
	GNSS Unit SBG	Ellipse-D
AREA OF APPLICATION	Radar Cross-section	in line with ISO 19206-9 / 19206-5 / ISO 19206-4 / ISO 19206-2
	Drive-over Capacity	Passenger vehicles Commercial vehicles Heavy Duty vehicles
	Targets (main use)	Pedestrian Adult Target Articulation (EPTa) Pedestrian Child Target Articulation (EPTc) Bicyclist Adult Target (EBTa) Bicyclist Child Target (EBTc) Playing Child Target (PCT) Standing Scooter Target (SST)
CONDITIONS	Operation Temperature Range	-5° C to 50° C
	IP Rating	IP66
	Relative Humidity Range	0%-95%, not condensing
	Recommended Storage Temperature	5° C to 25° C

KEY FEATURES

- Hot swappable batteries
- Speeds up to 20 km/h
- RTK DGNSS system for high accuracy
- On-the-spot turning for realistic pedestrian behavior
- Simple and reliable design
- Special stealth outer shell design for optimized radar signature
- Shoulder-to-shoulder testing to 500mm
- Weather resistance due to waterproof design

UFOnano®
TARGET CARRIER

UFOnano® – TARGET OPTIONS

Bicyclist Adult Target (EBTa)[2]

(UFO-1-5030)

Bicyclist Child Target (EBTc) [1]

(UFO-1-5035)

Pedestrian Adult Target Articulation (EPTa)[1]

(UFO-1-5050)

Pedestrian Child Target Articulation (EPTc)[1]

(UFO-1-5070)

Playing Child Target (PCT)[2]

(UFO-1-5180)

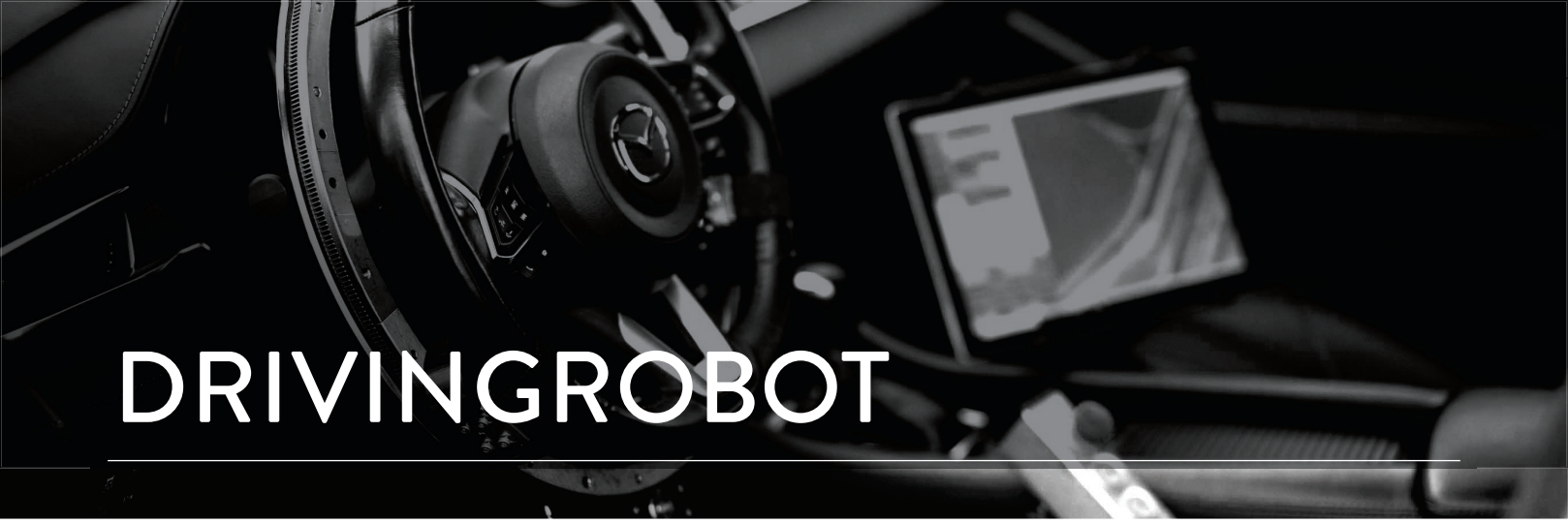
Standing Scooter Target (SST)[2]

(UFO-1-5190)

Icon designates targets that are Euro NCAP approved with the UROnano®.

[1] Image 4activeSystems GmbH
[2] Image Messring GmbH


HUMANETICS
ADAS ROBOT TESTING VEHICLE



DRIVINGROBOT

Whether you're testing passenger vehicles or heavy-duty trucks, our DrivingRobot modular (DRm) line provides a powerful, easy-to-install solution for ADAS and autonomous vehicle development. With three specialized versions — DRm45b™, DRm60™, and DRm150™ — the DRm family covers the full range of vehicle types and testing demands.

Designed with speed, safety, and ease of use in mind, the DRm can be installed in just 20–30 minutes using only one tool or no tools at all. Its modular structure allows for quick switching between test vehicles, without the need to remove airbags or steering wheels. Electronics and battery units are securely mounted using ISOFIX or seatbelt systems, ensuring both safety and convenience. The following page gives an overview of the three available versions — DRm150™, DRm60™, and DRm45b™ — to help you find the right fit for your testing needs.

DRm150™ – For Heavy-Duty Vehicle Testing

Designed specifically for buses, commercial vehicles, and trucks, the DRm150™ delivers high torque (150 Nm) and robust performance in demanding test environments. Its modular design ensures simple installation while maintaining the control and precision needed to meet the most rigorous testing protocols — including NCAP Truck Safety and NHTSA FMVSS 127.

- Powerful SRm150 steering robot for high-torque applications
- Mounts quickly with ISOFIX or seatbelt system
- Ideal for emergency braking, tight turns, and high-speed tests
- Seamless integration with UFObase

DRm60™ – For Passenger Vehicle and Van Testing

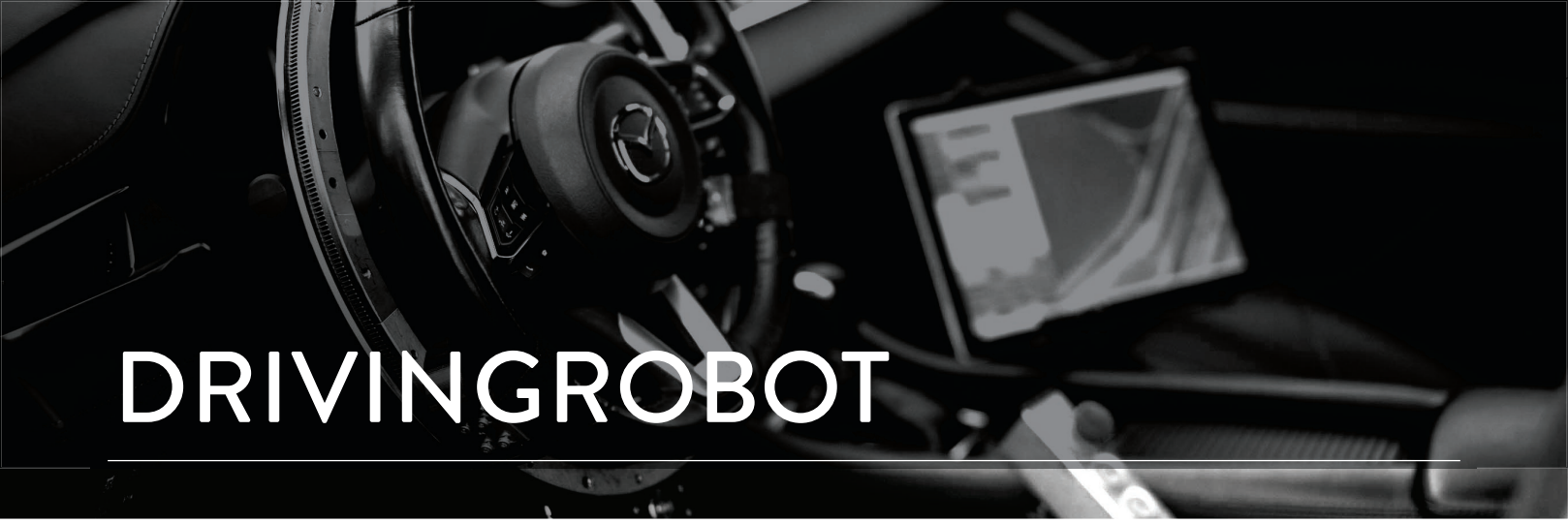
The DRm60™ is the versatile solution for cars, SUVs, and light commercial vehicles. With a 60 Nm steering motor (SRm60) and adjustable components, it combines ease of use with testing precision.

- Tool-free mounting of steering robot onto pre-centered adapter
- Split design allows multiple Vehicle Under Tests (VUTs) to be prepped in parallel
- Seamless integration with UFObase

DRm45b™ – Compact and Proven

Formerly known as the DRc, the DRm45b™ is our compact solution for passenger vehicle testing. All components are integrated into a single compact system that installs behind the original steering wheel — maintaining airbag functionality and driver comfort.

- Integrated design with minimal intrusion
- ISOFIX-mounted electronics box
- Ideal when space is limited or quick deployment is needed
- Seamless integration with UFObase



DRIVINGROBOT

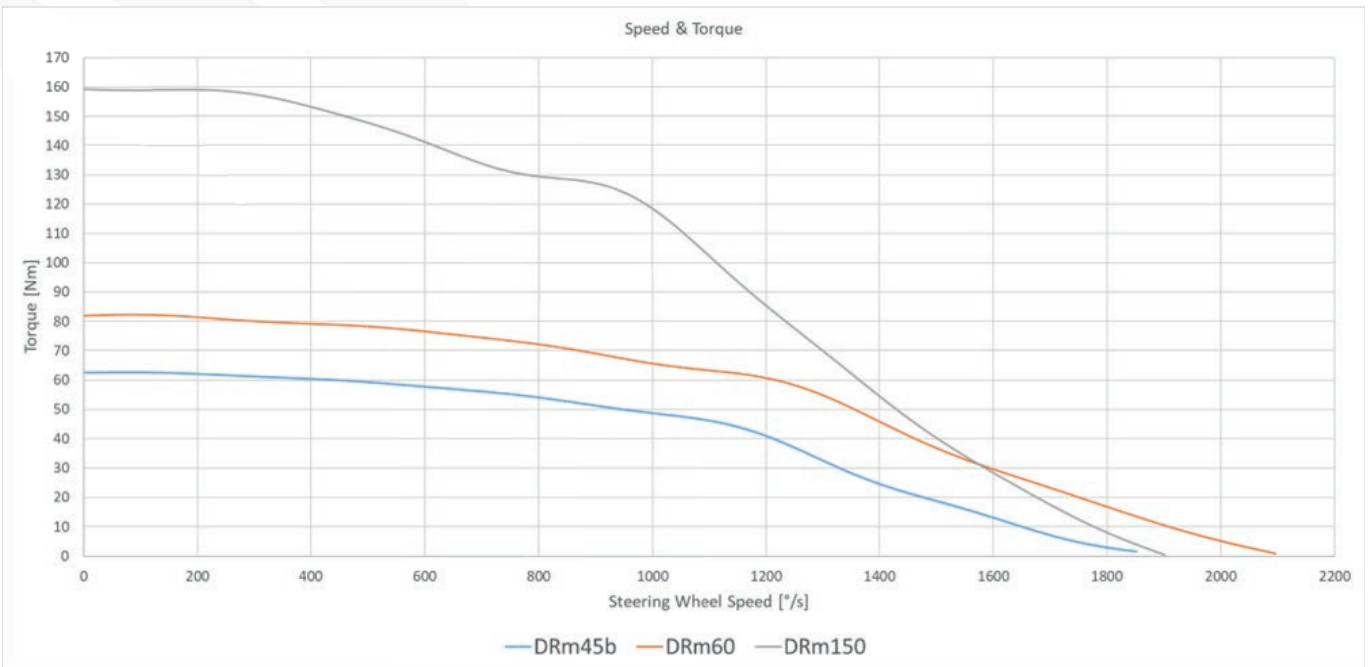
Modular Components for Custom Testing Needs

All DRm versions share a modular structure that allows tailored configuration:

SRm Steering Robots (SRm45b / SRm60 / SRm150): Choose based on torque requirements and space constraints.

Steering Wheel Adapter: Fits wheels between 330–550 mm, with tool-free setup and fast alignment.

PRm Pedal Robot: Mounts securely to seat rails, allowing full foot space and easy adjustment. Use independently or combined with steering control.



DRIVINGROBOT

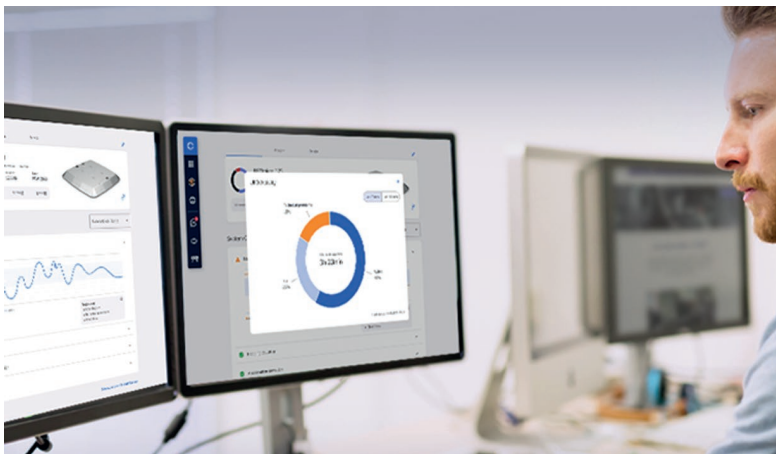
		DRm45b™	DRm60™	DRm150™
ROBOT CONTROL	Power Supply	48 V battery system, 760 Wh	48 V battery system, 760 Wh	48 V battery system, 760 Wh
	Signal Channels and Interfaces	CAN, RS232, Ethernet	CAN, RS232, Ethernet	CAN, RS232, Ethernet
	Sampling Frequency Range	100 Hz	100 Hz	100 Hz
	Compatibility	Humanetics UFO target carrier products (third party systems on request/interfaces)	Humanetics UFO target carrier products (third party systems on request/interfaces)	Humanetics UFO target carrier products (third party systems on request/interfaces)
	Power-Off Protection	Dedicated battery system	Dedicated battery system	Dedicated battery system
	Screen	Tablet PC for in-car use	Tablet PC for in-car use	Tablet PC for in-car use
BRAKE PEDAL ACTUATOR	Drive Mode	Brushless electric motor	Brushless electric motor	Brushless electric motor
	Max Torque	60 Nm at 400°/s	78 Nm at 400 °/s	150 Nm at 400°/s
	Max Velocity	1740 °/s at 5 Nm	2000°/s at 5 Nm	1840°/s at 5 Nm
	Rotational Inertia	0,0656 kgm2 incl. Ring guide		
	Steering Wheel Diameter	329-389 mm	330-510 mm	330-510 mm
	System Angle Control Accuracy	+/- 0.5°	+/- 0.5°	+/- 0.5°
	Control Mode	Path following, wheel angle control, steering wheel angle control, friction compensation	Path following, wheel angle control, steering wheel angle control, friction compensation	Path following, wheel angle control, steering wheel angle control, friction compensation
	Space Behind Steering Wheel	For fixation of clamps	no limitations	no limitations
	Space in front of Steering Wheel	no limitations	60 mm required	60 mm required
THROTTLE PEDAL ACTUATOR	Max Continuous Pedal Force	56 N	56 N	56 N
	Max Throttle Pedal Force	156 N	156 N	156 N
	Max Throttle Pedal Speed	1 m/s	1 m/s	1 m/s
	Max Stroke	104 mm	104 mm	104 mm
	Control Mode	Speed Control, Position Control, Force Control	Speed Control, Position Control, Force Control	Speed Control, Position Control, Force Control
BRAKE PEDAL ACTUATOR	Security	Safe Design – driver can overrule the brake and take over control at any time	Safe Design – driver can overrule the brake and take over control at any time	Safe Design – driver can overrule the brake and take over control at any time
	Drive Mode	Brushless electric motor	Brushless electric motor	Brushless electric motor
	Max Braking Force	1000 N (depending on mounting angle)	1000 N (depending on mounting angle)	1000 N (depending on mounting angle)
	Max Velocity	1 m/s	1 m/s	1 m/s
	Max Stroke	140 mm (depending on mounting angle)	140 mm (depending on mounting angle)	140 mm (depending on mounting angle)
	Control Mode	Speed Control, Position Control, Force Control	Speed Control, Position Control, Force Control	Speed Control, Position Control, Force Control

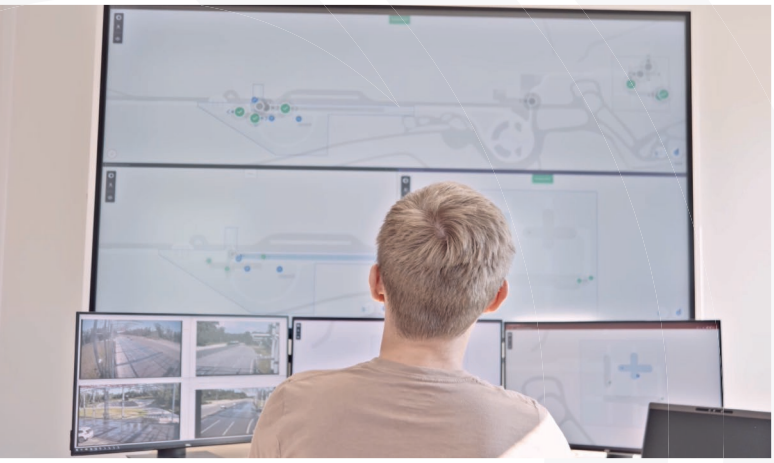
TRACKBASE **SUITE**

Modern vehicle testing is evolving rapidly. With the growing complexity of ADAS and automated driving systems, today's proving grounds face unprecedented pressure to increase efficiency, ensure accuracy, and adapt to rising regulatory demands. At the same time, resources—whether space, equipment, or personnel—are limited, and uncoordinated testing environments can lead to costly delays and safety risks.

TrackBase Suite is Humanetics' answer to these challenges. It is a fully integrated, modular software ecosystem designed to digitalize the proving ground and streamline the entire testing workflow—from planning and coordination to execution and analysis.

By connecting people, vehicles, equipment, and data in real-time, TrackBase Suite enables smarter, safer, and faster testing operations. It brings full transparency to test resources, reduces downtime, and ensures consistency across teams and scenarios.





Whether managing a busy proving ground, executing complex ADAS scenarios, or monitoring the performance of test equipment—TrackBase Suite brings clarity and control to every aspect of the process.

In the following pages, you'll find how each module—TrackBase Connect®, TrackBase Control™, and TrackBase Analyze™—works together to create seamless Digital Proving Ground Management. Each tool supports a different layer of the testing lifecycle, giving you the power to manage today's challenges and prepare for tomorrow's demands.

TRACKBASE **CONTROL**™

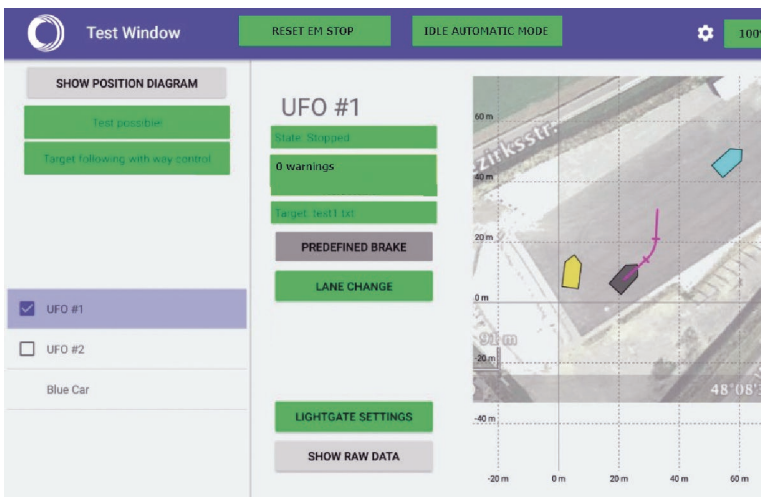
UFObase™

UFObase™ is the software for the UFO Target Carriers and DrivingRobots, and comes with an intuitive graphical user interface. To minimize preparation time on the proving ground, our UFObase™ Software can be used to preconfigure and simulate scenarios.

Test scenarios can be created and run with multiple target carriers and/or DrivingRobots simultaneously for swarm testing. The operator can live-monitor all connected robots, vehicles and their corresponding data such as position and speed.

Distinguishable and selectable control modes ensure that the UFOs and DrivingRobots operate in exact accordance with the customer's specifications. One can choose between way- or speed-controlled tests, and manual or automated triggers to predefine specific test scenarios like braking, lane change, and so on.

The optional Synchronization Software package offers additional synchronization modes between UFO target carriers and/or DrivingRobots to the VUT (Vehicle Under Test). To provide a maximum level of security, all UFO target carriers and DrivingRobots have their own on-board controller which in critical situations can bring the robot to a standstill. The control panel guarantees that a single operator is in command while a test is active, and can intervene if necessary. Additional equipment from Humanetics, such as the Traffic Light Box, can easily be added to the test setup in the UFObase™ software.



UFObase™ script language (UBS) is designed to give the user extensive flexibility in programming complex and multi-functional test scenarios. Evasive maneuvers are used to support the test engineers in increasing safety and efficiency by avoiding / mitigating collisions. With the ISO interface (ISO 22133 WD) the robot infrastructure and the robots themselves can be connected with third party test equipment, which enables flexible monitoring and control.

ADAS WORKFLOW SOFTWARE

OPTIMIZED ADAS WORKFLOW

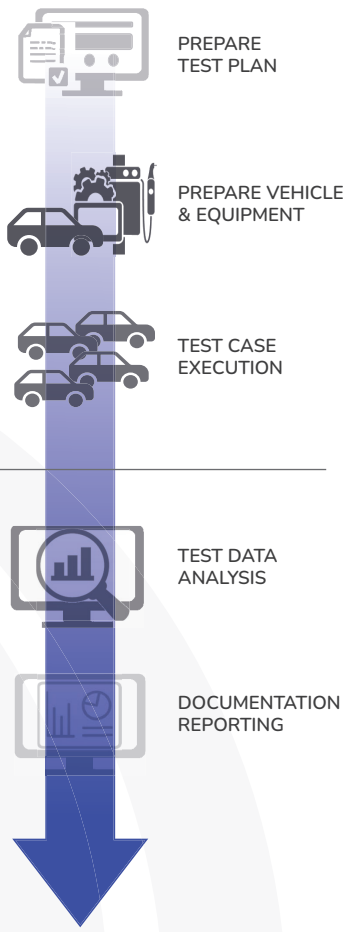
In cooperation with AVL, Humanetics has designed an optimized workflow for proving ground testing which supports customers in their daily challenges. This comprehensive prepackaged Suite is intended to simplify and streamline future ADAS test procedures while saving time and cost. In addition to the software side, the ADAS Suite also includes the UFO Target Carrier and DrivingRobot.

Test Preparation - Execution

- A wide range of preconfigured test scenarios utilizing UFO target carrier and/or DrivingRobot are part of the library (Euro NCAP and others)
- Scenarios adapt based on data input from test engineer (ex: overlap based on vehicle's width)
- Robots are self-calibrated

Test Evaluation - Reporting

- Instant validation of the test case
- Test plan is automatically identified in order to eliminate potential human errors
- Automated report generation with standardized set of NCAP report templates, which can also be adapted according to customer requirements



See the Optimized ADAS workflow in action.

KEY FEATURES

- Intuitive graphical user interface with test simulation and on-line monitoring of UFO target carrier and/or DrivingRobot position
- Monitors multiple UFOs and/or DrivingRobots from one operator source simultaneously for swarm testing
- Visual meeting/crash point configuration
- Live raw-data monitoring
- On-board controller
- Distinctive control algorithms (velocity, way, synchronized to VUT)
- PMC file importer (ABD driving robots)
- Data Outputs: Log-file after test, CAN live data output, NCOM stream live output
- Virtual fence provides additional safety precaution
- UFObase Script language (UBS)
- ISO interface (ISO22133 WD) monitoring and control

TRACKBASE **ANALYZE** ™
SYSTEM STATUS

TrackBase is the new product family designed to streamline and enhance every aspect of proving ground operations. From real-time test track coordination with TrackBase Connect® to performance diagnostics with TrackBase Analyze™. It's specialized module System Status is focusing on Humanetics platform performance.

TrackBase Analyze™ is designed to tackle challenges that can occure with performance issues of platforms by providing **Proactive Health Monitoring and KPI Tracking**. It continuously evaluates key performance indicators such as downtime, error states, and active testing time. This **ensures that customers can identify potential problems before they escalate**, improving operational efficiency and reducing unexpected platform downtime by 25%[1].

With Automated System Check Runs, TrackBase Analyze™ detects performance irregularities early. Without automation, identifying issues is time-consuming and error-prone, leading to delayed maintenance and increased costs. **TrackBase Analyze™ minimizes these risks by running structured tests in under 60 seconds and highlighting values that exceed defined thresholds**, allowing customers to address issues proactively rather than reactively.

Automated Insights for Long-Term Success: Often, unclear error messages make troubleshooting difficult, and resolving issues requires external support, resulting in productivity loss. TrackBase Analyze™ helps by providing clear diagnostics and targeted recommendations, reducing reliance on external assistance and enabling faster issue resolution.

KEY FEATURES

- **Enhances remote support efficiency** with data from system checks runs
- **Automatic System Check Runs** alerting out of norm values
- **Provides targeted suggestions** to resolve common robot issues
- **Enhanced KPI Monitoring** to ensure optimal robot functionality
- **25% Reduced Platform Downtime** due to proactive health monitoring[1]
- **Predictive Maintenance** due to proactive health monitoring[1]

HUMANETICS

[1] Estimated 25% reduction in downtime applies only to issues originating from the platform and does not extend to failures related to infrastructure equipment.

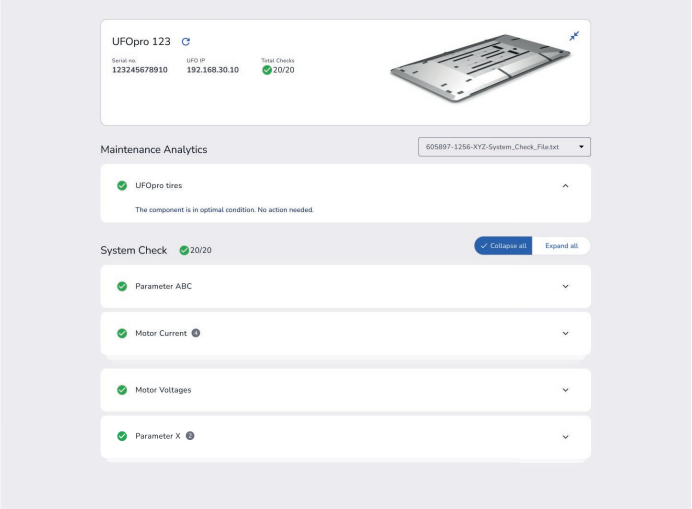
TRACKBASE **ANALYZE** ™
SYSTEM STATUS

In addition to improving efficiency, TrackBase Analyze™ helps customers extend the operational lifespan of their Humanetics UFOs. By catching minor issues before they escalate, the system prevents unnecessary wear and tear, leading to lower maintenance costs over time.

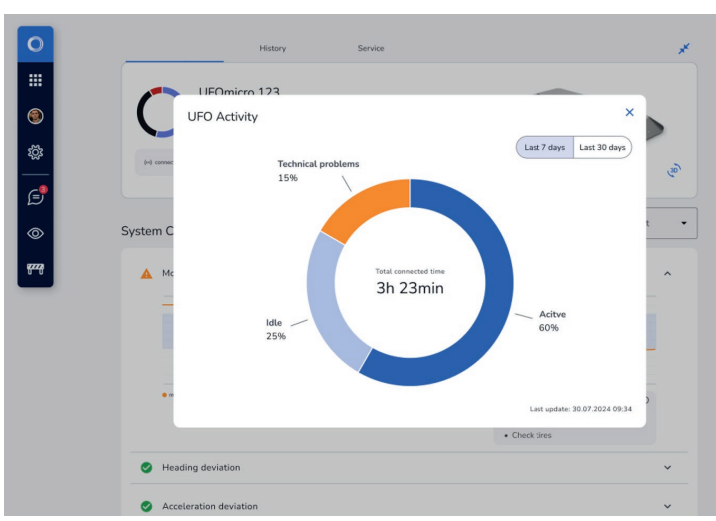
Furthermore, TrackBase Analyze™ enables better resource planning by offering **real-time insights into performance trends**. Customers can anticipate when maintenance will be required, ensuring that necessary actions are taken before problems impact operations.

Our advanced machine learning models analyze existing performance data to detect tire wear and drivetrain belt degradation without the need to retrofit equipment with additional sensors. By identifying early signs of failure, it helps prevent costly downtime, optimize maintenance schedules, and extend component lifespan, ensuring maximum reliability and efficiency.

By implementing TrackBase Analyze™, customers can **reduce testing downtime, optimize performance**, and ensure that their Humanetics UFOs operate at peak efficiency. The ability to proactively monitor, diagnose, and address issues helps prevent costly delays and maintain a seamless workflow.



UFO STATUS OVERVIEW



UFO ACTIVITY OVERVIEW

TRACKBASE **CONNECT**®

In the dynamic landscape of ADAS/AV testing, the demand for efficient proving ground testing has emerged as a critical necessity. Our software solution is offering a holistic view.

TrackBase Connect® is an advanced proving ground software solution designed to enhance efficiency and success of your testing processes. Central to this solution is the efficient utilization of space and resources. Different test teams can share testing areas in parallel. TrackBase Connect®'s capabilities extend to **enhancing the overall efficiency of proving ground operations**. By facilitating resource sharing and minimizing time wastage, it substantially boosts productivity across the board. Visual representation plays a pivotal role, offering a comprehensive overview of ongoing activities and resource allocation. This **transparency enables optimal test planning and execution.**

Integration is a cornerstone of TrackBase Connect®. It seamlessly incorporates diverse elements such as test equipment (which conform to ISO22133 standards), vehicles, and various infrastructure components. The integration extends to infrastructure equipment like traffic lights, road lights, weather stations and more. This consolidation into a single solution streamlines operations and enhances accuracy.

We are dedicated to understanding the unique challenges of ADAS/AV testing, which is why we provide thorough support with the implementation of TrackBase Connect®. To ensure a smooth process and getting the most out of the software. Each implementation is tailored to your needs, and designed to maximize the value you derive from the software.

KEY FEATURES

Improved Area Usage
Parallel test teams with shared area utilization

Easy Coordination between teams
Shared status of testing team and driveables, scenario area usage with team members, other teams as well as proving ground

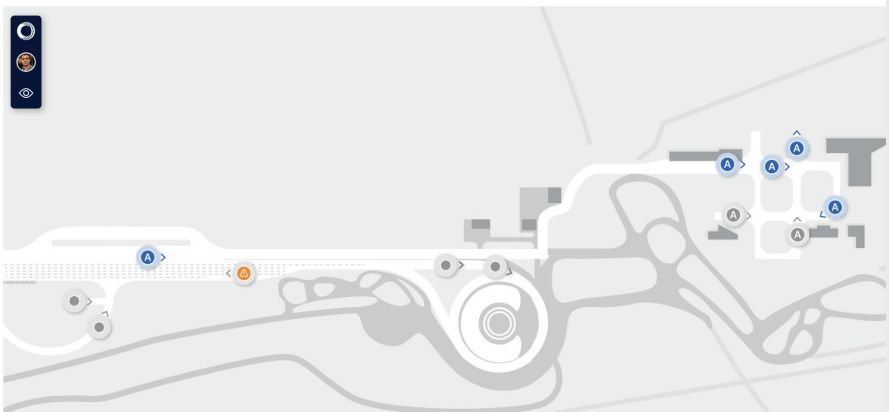
Infrastructure Integration
Ability to integrate weather station, traffic lights, road lights, rain generator, access gates / traffic lights, mesh WiFi, and road conditions

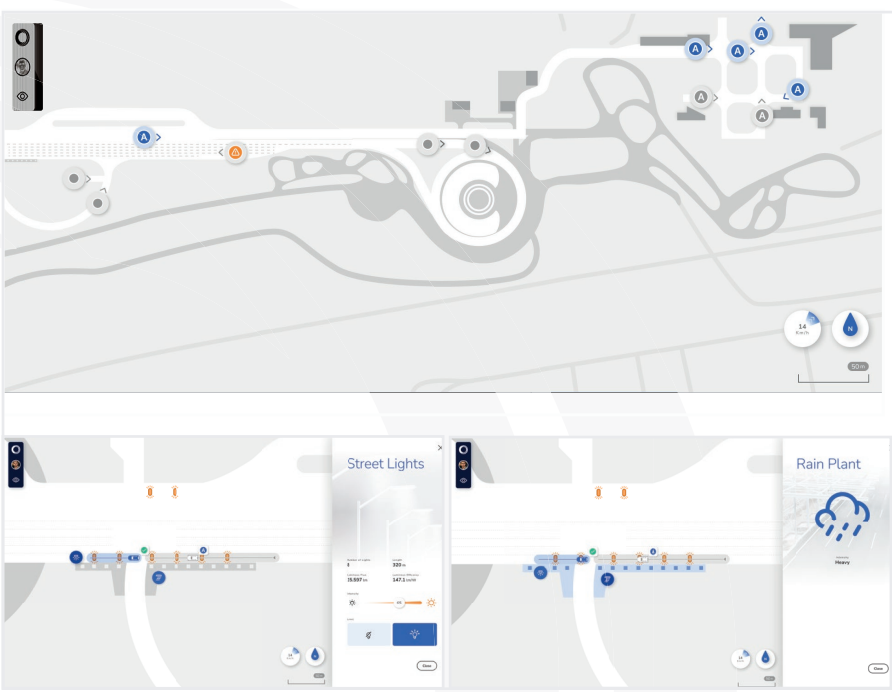
Integration option with third-party ADAS equipment
ISO22133 compatible device

TRACKBASE CONNECT®

VISUALIZATION OF ALL ACTIVITIES

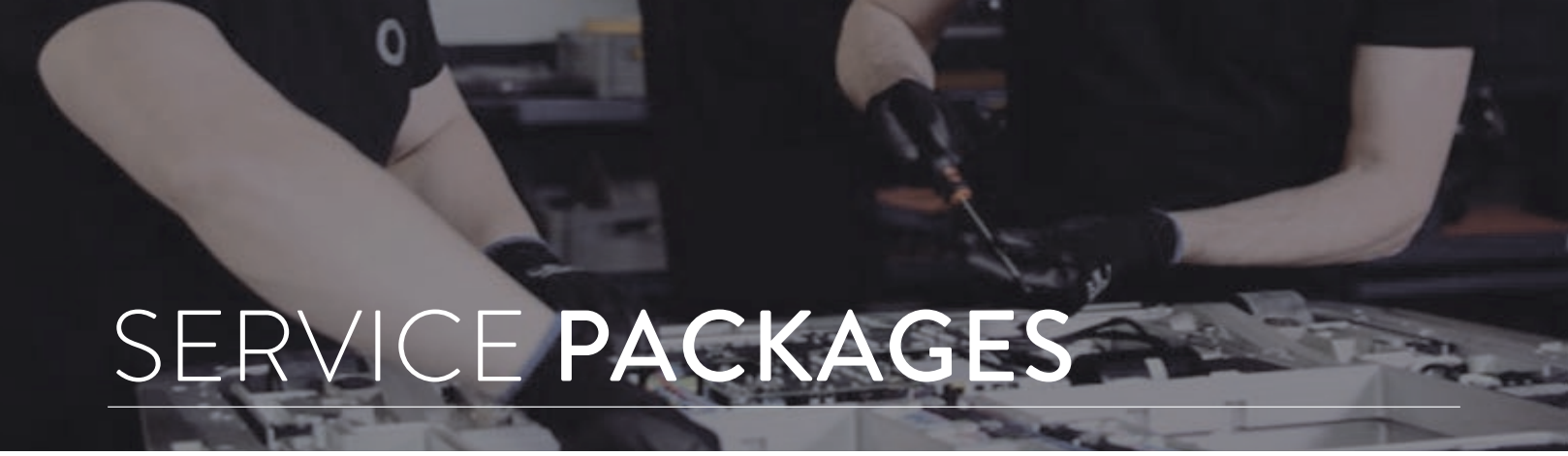
Gain real-time visibility into proving ground activities, including space requirements, team activities, and drivable status through advanced visualization techniques. Effectively coordinate and manage test operations by monitoring vehicle readiness and automated movements along designated trajectories.





INTEGRATION OF PROVING GROUND EQUIPMENT

Make the most of third-party integration, like traffic lights. This allows through testing of advanced ADAS/AV scenarios, efficiently designating restricted zones during active tests. Elevate control and precision on the proving ground by integrating third-party elements, such as rain machines or traffic lights, into your scenarios, managing complexity and controlled access effectively.



SERVICE **PACKAGES**

Reliability and flexibility are crucial in everyday testing on the proving ground. With our mission in mind to best serve our customers, Humanetics has created service packages particularly tailored for active safety testing. The service packages are available as basic, silver, gold and platinum versions.

The service packages are valid for one year from the date of order receipt and can be purchased for each robot separately. Customers will be notified about the annual services by the Humanetics support team. Other package services can be freely scheduled and chosen on demand by the customer. Please note that repair and shipping costs are not included in the packages. Details of the different services packages are listed hereafter.

Remote support: Our team is available to answer any questions you may have: Monday to Thursday 08:30 a.m. to 05:00 p.m. and Friday 08:30 a.m. to 12:00 p.m. CET. Additional support, outside of our standard support times is available with a 48 hour in advance notice.

Priority remote support: or advanced service package members, our team is available outside of standard support hours with a 48 hour advance notice without additional charges (Saturday and Sunday excluded). Any support requests received will be processed with priority.

Priority ticket system: Tickets arising from support calls, support emails and/or remote support sessions are being processed with priority, with third level support of development department if required. Ticket processing and customer communication within 12 hours.

Annual robot service: Regular robot maintenance extends their lifespan and ensures smooth operation. The annual robot service is available for UFOs and DrivingRobots. It includes cleaning and inspection of components as well as replacement of standard wear parts (list can be provided on demand). Other components can be replaced if necessary. In addition, the service includes safety components check and software updates. Please note that the service must be utilized within a year.

Pool equipment access: If robots are not ready for operation due to malfunctions, replacement equipment is provided - including robot infrastructure set, batteries and smart charger.

Priority spare parts delivery: In stock spare parts are being packed and shipped within 24 hours after order receipt.

Annual battery health-check: The annual battery health-check includes a thorough check of the robot's batteries at a Humanetics' facility, including the next health check reference.

Software update: Quarterly update of the software of UFOs and DrivingRobot.

Loan platform during service and repair: If needed, a loan robot will be provided during annual robot maintenance or repair periods.

Spare parts frame contract: Fixed prices of spare parts, guaranteed for a period of one year.

SERVICE **PACKAGES**

	STANDARD	PROFESSIONAL	PREMIUM *
Software Update	✓	✓	✓
Remote Support	✓	✓	✓
Annual Robot Service		✓	✓
Annual Battery Health Check		✓	✓
Priority Remote Support			✓
Priority Ticket System			✓
Pool Equipment Access			✓
Priority Spare Parts Delivery			✓
Spare Parts Frame Contract			✓
Loan Platform during Repair			✓
Loan Platform during Service			✓

* Premium Service Package is not available in the US.

STANDARD SERVICE PACKAGE

The software maintenance package facilitates smooth operation with remote support during business hours and beyond, with 48 hours' notice. Quarterly updates keep your software up to date.

PROFESSIONAL SERVICE PACKAGE

The professional service package covers base service requirements that arise when using the robots. The costs vary depending on the number of robots and kind of infrastructure set. Additionally, the annual robot service is included, ensuring regular maintenance, cleaning, inspection, and replacement of standard wear parts for UFOs and DrivingRobots. Remote support is also provided, offering assistance and troubleshooting as needed.

PREMIUM SERVICE PACKAGE

The premium service package covers all customer needs for a carefree and smooth working day. The costs vary depending on the number of robots and kind of infrastructure set. It includes priority spare parts delivery, with in-stock parts shipped within 24 hours, as well as loan platforms during service and repair.

ACTIVE SAFETY ACADEMY

The Active Safety Academy offers a comprehensive educational experience with in-depth knowledge of active safety technologies. The academy provides participants with the tools they need to contribute meaningfully to the development and optimization of safety-critical systems.

Many companies face challenges in maximizing the capabilities of their ADAS test equipment due to insufficient training and skill development. Undertrained engineers often struggle to fully leverage the potential of their tools, leading to frequent errors, increased maintenance costs, and project delays. New hires, trained in general principles rather than specific applications, encounter steep learning curves, further reducing productivity.

The Active Safety Academy addresses these issues with comprehensive, flexible training designed to equip engineers with the specialized skills they need. Accessible from any device, whether in the office or on the go, the Academy's web-based platform empowers learners to gain knowledge wherever and whenever needed.

Participants have access to a rich library of on-demand resources, including videos, tutorials, guides, and quizzes. These materials can be used for quick reference or in-depth study, allowing operators to continually enhance their skills. Supervisors benefit from progress-tracking tools that provide insights into employee development, ensuring consistent quality and safety across teams.

KEY FEATURES

Web-Based Application
allows access from different devices

Dedicated Safety Module
raises awarness and knowledge for increased safety

Active Safety Overview
get a full overview of the active safety equipment

Infrastructure Module
how can infrstructure elements elevate testing

Charging Module
learn everything about the hot-swappable battery design including charging of battery packs

Hardware Module
gain insights into the hardware design and assembly of the robots

Software Module
deep dive into GNSS unit configuration as well as UFObase™ and the Target Generator

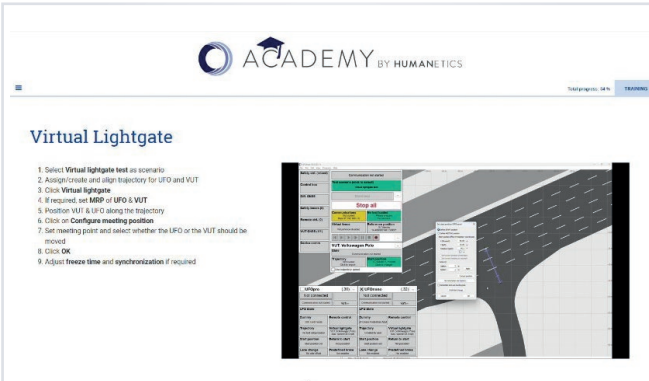
ACTIVE SAFETY ACADEMY

Successful participants earn a certificate that validates their skills and meets industry standards. These certifications provide value, demonstrating proficiency and supporting informed project assignments and team development.

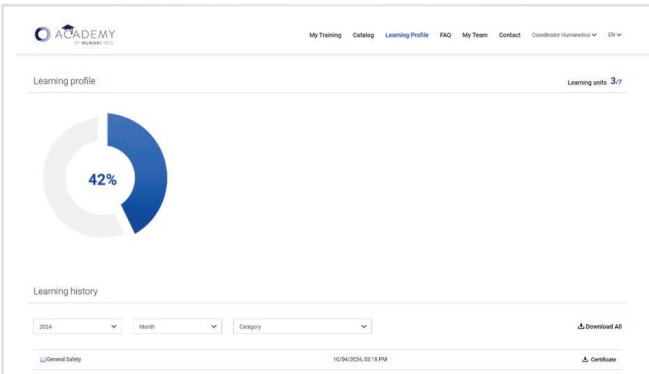
Current training offerings focus on comprehensive courses for our UFOpro, UFOmicro, and UFOnano systems. Modules cover essential topics such as infrastructure setup, battery charging protocols, hardware components, and assembly processes. Participants also gain hands-on experience with software tools like UFObase™, Target Generator, and the GNSS Configurator, ensuring a balanced understanding of both hardware and software.

In the near future, the curriculum will expand to include training on the DRm and DRc devices, along with modules for software updates and maintenance best practices. This continuous development ensures learners stay up-to-date with the latest advancements, preparing them to handle a wide range of tasks with confidence.

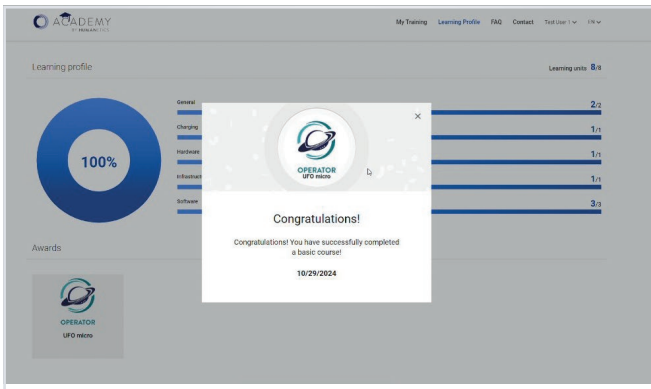
The Academy offers a cost-effective solution, eliminating travel expenses and providing perpetual access to all training modules for an annual user fee. With tools for progress tracking, analytics, and adaptive learning paths, the Active Safety Academy increases knowledge retention and supports operational excellence.



INTUITIVE TRAINING COURSES

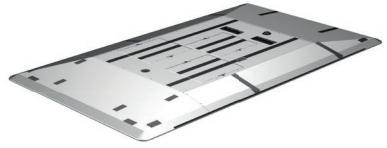


LEARNING OVERVIEW TRACKING PROGRESS



CERTIFICATE OF COMPLETION

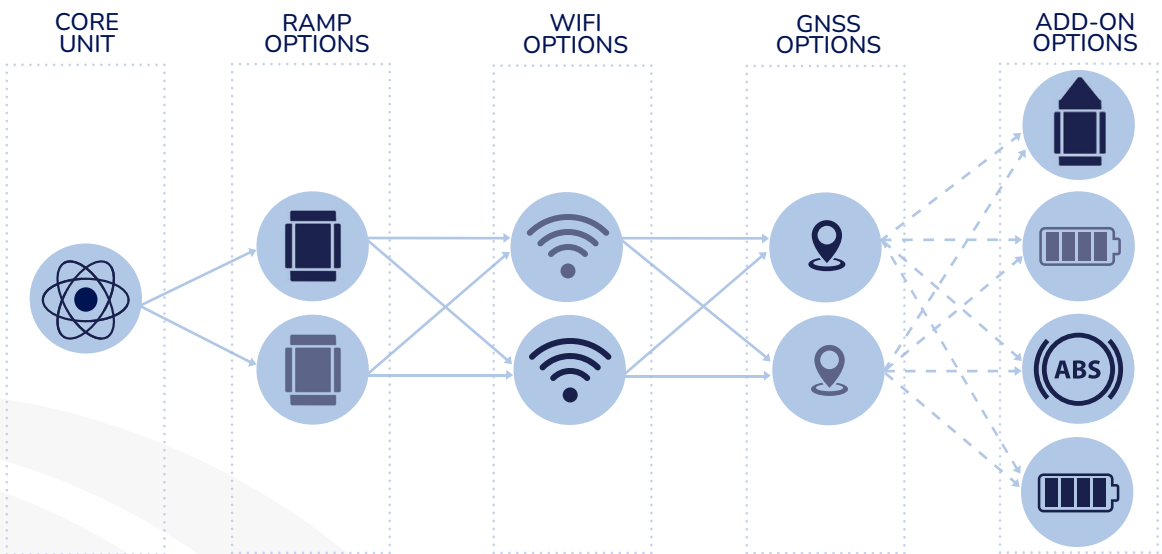
PRODUCT OVERVIEW

		UFOpro®	*UFOpro BlackSeries*	UFOmicro®	UFOnano®
					
DIMENSIONS	Transportation Size	1605 x 1100 mm	1605 x 1100 mm	1050 x 980 mm	700 x 800 mm
	Test Ready Size	2950 x 1690 mm	2950 x 1690 mm	1050 x 980 mm	700 x 800 mm
	Chassis Height	98 mm	98 mm	70 mm	15 - 65 mm
	Test Ready Weight	244 kg	264 kg	85 kg	25 kg
	Payload	125 kg	125 kg	25 kg	12 kg
	Overrun Capacity	45 tons (Heavy Duty Version)	45 tons (Heavy Duty Version)	45 tons	45 tons
	Clearance	15 mm	15 mm	15 mm	10 mm
DYNAMICS	Maximum Speed Forward	80 km/h	100 km/h	90 km/h	20 km/h
	Maximum Speed Backward	20 km/h	20 km/h	20 km/h	10 km/h
	Maximum Longitudinal Acceleration	1.8 m/s^2	1.4 m/s^2	4 m/s^2	2 m/s^2
	Maximum Longitudinal Deceleration	6 m/s^2	6 m/s^2	6 m/s^2	3 m/s^2
	Maximum Lateral Acceleration	1.5 m/s^2	1.5 m/s^2	3 m/s^2	1.5 m/s^2
	Minimum Turning radius	6 m at 5 km/h	6 m at 5 km/h	3.5 m at 10 km/h	0 m (turn on spot)
ENERGY	Batteries Included	2	3	2	4
	Charger Included	2	3	2	2
	Battery Technology	Lithium Iron Phosphate (LiFePO4)	Lithium Iron Phosphate (LiFePO4)	Lithium Iron Phosphate (LiFePO4)	Lithium Ion

ENERGY	Battery Capacity	2048 Wh	3072 Wh	512 Wh	144 Wh
	Voltage	51.2	51.2	51.2	28
	Battery Slots	3	3	2	2
	Battery Swapping Time	2 minutes (hot swappable)	2 minutes (hot swappable)	2 minutes (hot swappable)	2 minutes (hot swappable)
	Battery Set Charging Time	90 minutes	90 minutes	25 minutes	90 minutes
	Battery Life Time (common NCAP Testing)	Full testing day (up to 60 NCAP scenarios)	Full testing day (up to 80 NCAP scenarios)	Half testing day	Full testing day (up to 30 NCAP scenarios)
ACCURACY	Speed Control Accuracy	0.2 km/h	0.2 km/h	0.2 km/h	0.2 km/h
	Speed Measurement Accuracy	0.05 km/h	0.05 km/h	0.05 km/h	0.05 km/h
	Side Control Accuracy	50 mm	50 mm	50 mm	50 mm
	Yaw Rate	+/- 1 deg/s	+/- 1 deg/s	+/- 1 deg/s	+/- 1 deg/s
	Accuracy	in line with ISO 19206-7	in line with ISO 19206-7	in line with ISO 19206-7	in line with ISO 19206-7
	GNSS Unit Oxford	OEM3000v3	OEM3000v3	OEM1000v2	OEM1000v2
	GNSS Unit SBG	-	-	Ellipse-D	Ellipse-D
AREA OF APPLICATION	Radar Cross-section	in line with ISO 19206-3	in line with ISO 19206-3	in line with ISO 19206-9 / 19206-5 / ISO 19206-4 / ISO 19206-2	in line with ISO 19206-9 / 19206-4 / 19206-2
	Drive-over Capacity	Passenger vehicles Commercial vehicles Heavy Duty vehicles	Passenger vehicles Commercial vehicles Heavy Duty vehicles	Passenger vehicles Commercial vehicles Heavy Duty vehicles	Passenger vehicles Commercial vehicles Heavy Duty vehicles
	Targets (main use)	Passenger Vehicle 3D Target (GVT) REF. F Passenger Vehicle 3D Target (GVT) REF. G	Passenger Vehicle 3D Target (GVT) REF. F Passenger Vehicle 3D Target (GVT) REF. G	European Motorcycle (EMT) E-Scooter CNCAP Target (PTW) Pedestrian Adult Target Articulation (EPTa) Pedestrian Child Target Articulation (EPTc) Bicyclist Adult Target (EBT) Bicyclist Child Target Playing Child Target (PCT) Standing Scooter Target (SST)	Pedestrian Adult Target Articulation (EPTa) Pedestrian Child Target Articulation (EPTc) Bicyclist Adult Target (EBT) Bicyclist Child Target Playing Child Target (PCT) Standing Scooter Target (SST)
CONDITIONS	Operation Temperature Range	-5° C to 50° C	-5° C to 50° C	-5° C to 50° C	-5° C to 50° C
	Weather resistance	fully sealed electronics	fully sealed electronics	fully sealed electronics	Fully sealed electronics
	Recommended Storage Temperature	5° C to 25° C	5° C to 25° C	5° C to 25° C	5° C to 25° C
	IP Rating	IP66	IP66	IP66	IP66
	Relative Humidity Range	0%-95%, not condensing	0%-95%, not condensing	0%-95%, not condensing	0%-95%, not condensing

OPTIONS FOR **YOUR NEEDS**

All our platforms offer customizable purchasing options, each containing a core unit. Customers can choose between WiFi configurations (Mesh or M2) and GNSS systems (SGB or OxTS), along with various add-on options. Each component is designed to integrate seamlessly, allowing you to create a tailored solution that meets your specific testing requirements.



Wifi Options

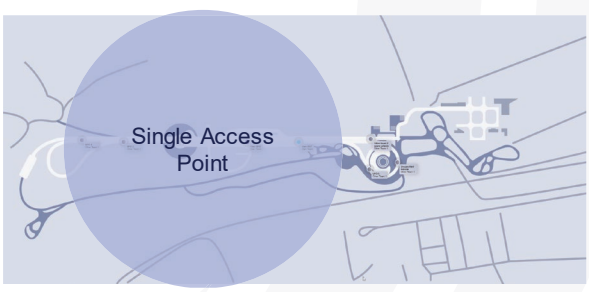
Understanding the differences between Ubiquiti M2 and Rajant Mesh systems is crucial for selecting the right wireless network solution for your needs.

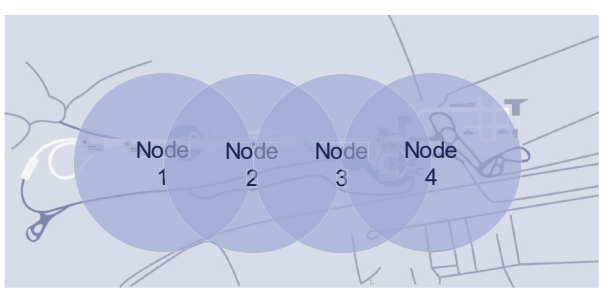
Ubiquiti M2

The Ubiquiti M2 system operates with a single Access Point connected to multiple Clients. In this setup, each client device communicates solely with the Access Point. All network traffic is routed through the Access Point, which then forwards the data to the intended recipient. The maximum operational distance on a proving ground is limited by the range of a single antenna.

Rajant Mesh

In contrast, the Rajant Mesh system uses a network of multiple equal Mesh nodes. Each node in the network is connected to all nearby nodes, creating a robust and flexible communication web. The system automatically selects the best path for data transmission, enhancing network efficiency and reliability. This setup is referred to as WiFi with multiple equal Mesh nodes. The maximum distance on a proving ground can be extended by adding additional nodes, each covering approximately a 250-meter radius.





UFOpro® / UFOpro BLACKSERIES TARGET CARRIER

1 UFOpro® - Core

#UFO-2

UFOpro® target carrier is designed for passenger vehicle testing with speeds up to 80 km/h and includes the following:

- Two hot swappable batteries, ideal for a full testing day
- UFO toolbox and spare part box
- Four UFO handles for carrying the UFO
- One battery charging set with transport box

See the UFOpro® target carrier in action.

1 UFOpro *BlackSeries* - Core

#UFO-3

UFOpro *BlackSeries* target carrier is designed for passenger vehicle testing with speeds up to 100 km/h and includes the following:

- Three hot swappable batteries, ideal for a full testing day
- UFO toolbox and spare part box
- Four UFO handles for carrying the UFO
- One battery charging set with transport box

See the UFOpro BlackSeries target carrier in action.

1.1 UFOpro® Ramp Options

UFOpro® - Standard Ramps (UFO-1-1010-0051)

- Screw-less, welded ramps system for reduced Radar Cross Section designed for passenger vehicle testing.

UFOpro® - Heavy Duty Ramps (UFO-1-1020-0021)

- Reinforced, screw-less, welded ramps system for reduced Radar Cross Section designed for Heavy Duty Vehicle Testing.

UFOpro® / UFOpro BLACKSERIES TARGET CARRIER

1.2 UFOpro® WiFi Options

UFOpro® - WiFi - M2 (UFO-2-1001) / WiFi - AC (UFO-2-1005)

- Powerful M2 WiFi connection with up to 600mW of power. The M2 is ideal for long-distance links, capable of 100Mbps+ TCP/IP speed over multi-km distances

UFOpro® - WiFi - Mesh (UFO-2-1002)

- Mesh network node enables reliable edge connectivity. It uses 2.4-5 GHz dual-band transceiver and is designed for constantly-moving network elements.

1.3 UFOpro® Optional Add-ons

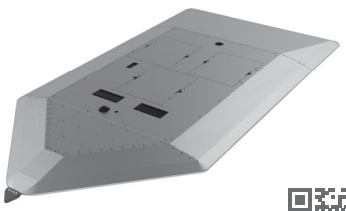
ABS Set (UFO-1-8320)

- Rotary encoders, mounted on front tires
- For reduced flat spots and controlled deceleration
- Can be installed either in UFOpro® or UFOpro *BlackSeries*
- Special control algorithm to deliver best accuracy during deceleration to avoid tire flat spots and increase their lifespan.

See the ABS Upgrade in action.

UFOpro® - Arrow Ramp Set (UFO-1-1040-0042)

- Designed for side impact scenarios (UFO with GVT crashing into side of VUT)
- Designed to slide smoothly under vehicle tire
- Arrow Ramp can be swapped with a front ramp for UFOpro® / UFOpro *BlackSeries*
- Arrow Ramp frame is made from aluminum for passenger car overrun



See the Arrow Ramp Set in action.

UFOpro® / UFOpro BLACKSERIES TARGET CARRIER

1.3 UFOpro® Optional Add-ons

UFOpro® Battery (UFO-1-3010)

See the easy battery swap in action

- UN 38.3 certified
- Voltage 52.8 V
- Capacity 2,91 kWh/set
- Cell type LiFePo4

UFOpro® Battery - Heavy Duty Version (UFO-1-3080)

- UN 38.3 certified
- Voltage 52.8 V
- Cell type LiFePo4

UFOpro® Battery Transport Box (UFO-1-2220)

- Reinforced case for safe transport and storage of the UFOpro® batteries.
- Up to three can be stored per case

UFOmicro®
TARGET CARRIER

2 UFOmicro® – Core

#UFO-8

Designed for PTW testing reaching speeds up to 90 km/h and includes the following:

- UFOmicro® robot, including GNSS unit
- Two chargers and two batteries
- UFOmicro® tool part box
- Spare part box

See the UFOmicro® in action

2.1 UFOmicro® – WiFi Options

UFOmicro® - WiFi - M2 (UFO-8-1001) / WiFi - AC (UFO-8-1003)

- Powerful M2 WiFi connection with up to 600mW of power. The M2 is ideal for long-distance links, capable of 100Mbps+ TCP/IP speed over multi-km distances

UFOmicro® - WiFi - Mesh (UFO-8-1002)

- Mesh network node enables reliable edge connectivity. It uses 2.4-5 GHz dual-band transceiver and is designed for constantly-moving network elements

2.2 UFOmicro® – GNSS Options

UFOmicro® - GNSS - SBG (UFO-9-0219)

- The Eclipse-D Inertial Navigation System integrating a dual-antenna, multi-band GNSS receiver, capable of delivering precise heading as well as centimeter level position accuracy in the most challenging GNSS conditions.

UFOmicro® - GNSS - OxTS (UFO-9-0181)

- The OEM1000 INS solution enables precise centimeter level positioning accuracy

UFOmicro®
TARGET CARRIER

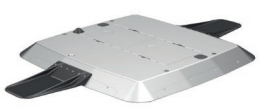
2.3 UFOmicro® – Optional Extension

UFOmicro® - VRU Extension (UFO-8-1100)

- Allows VRU testing with increased stability
- UFOmicro® with VRU extension can be used with the following targets:
  - Pedestrian Adult Target Articulation (EPTa) (UFO-1-5050)
    → NCAP approved combination
  - Pedestrian Child Target Articulation (EPTc) (UFO-1-5070)
    → NCAP approved combination
  - Bicyclist Adult Target (EBT) (UFO-1-5030)
    → NCAP approved combination
  - Bicyclist Child Target (UFO-1-5035)
  - Playing Child Target (PCT) (UFO-1-5180)
  - Standing Scooter Target (SST) (UFO-1-5190)

UFOmicro® - PTW Extension (UFO-8-1200)

- Allows for PTW testing with increased stability
- UFOmicro® with PTW extension can be used with the following targets:
  - European Motorcycle Target & Stands (UFO-1-5140)
    → NCAP approved combination
  - E-Scooter CNCAP Target (UFO-1-5150)
    → NCAP approved combination



2.4 UFOmicro® – Additional Equipment

UFOmicro® - Battery (UFO-8-3170)

- UN 38.3 certified
- Voltage 52.8 V
- Capacity 0,51 kWh/set
- Cell type LiFePo4

UFOmicro® - Battery Transport Box (UFO-1-6120)

- Reinforced case for safe transport and storage of the UFOmicro® batteries

UFOnano®
TARGET CARRIER

3 UFOnano® -Core

#UFO-9

- Designed for pedestrian and bicycle testing
- Maximum speed of up to 20 km/h
- Turn on spot function
- Two hot swappable batteries
- UFO toolbox and spare part box
- One battery charging set with transport box

See the UFOnano® in action

3.1 UFOnano® – WiFi Options

UFOnano® - WiFi - M2 (UFO-9-1001) / WiFi - AC (UFO-9-1006)

- Powerful M2 WiFi connection with up to 600mW of power. The M2 is ideal for long-distance links, capable of 100Mbps+ TCP/IP speed over multi-km distances

UFOnano® - WiFi - Mesh (UFO-9-1002)

- Mesh network node enables reliable edge connectivity. It uses 2.4-5 GHz dual-band transceiver and is designed for constantly-moving network elements

3.2 UFOnano® – GNSS Options

UFOnano® - GNSS - SBG (UFO-9-0219)

- The Eclipse-D Inertial Navigation System integrating a Dual-antenna, multi-band GNSS receiver, capable of delivering precise heading as well as centimeter level position accuracy in the most challenging GNSS conditions

UFOnano - GNSS - OxTS (UFO-9-0181)

- The OEM1000 INS solution enables precise centimeter level positioning accuracy

3.3 UFOnano® – Additional Equipment

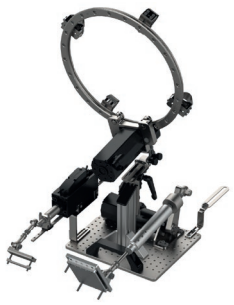
UFOnano® - Battery Set (UFO-1-3160)

- Includes two additional UFOnano® batteries

DRIVINGROBOT

4 DrivingRobot compact #UFO-5

- Steering and pedal hardware install directly over existing equipment in the vehicle
- GNSS unit OxTS RT (UFO-5-1001 dual antenna – including mounting strat)
- Two dGNSS antennas for mounting on the vehicle
  including additional antenna base discs for glass roofs
- WiFi communication equipment
- Tool set
- 48 V lithium battery pack for independent power supply
- One battery charger
- Optimized for ADAS / AV testing protocols
- ISOFIX connector for DrivingRobot Box



Please note: DGNSS correction data to be supplied by customer

VUT & DrivingRobot GNSS Set (UFO-5-1001)

- GNSS Mounting Plate for Cars
- IMU Mounting Kit
- GNSS Unit RT3000V3

4.1 DrivingRobot compact- WiFi Options

VUT & DrivingRobot Bullet - M2 (UFO-1-8410) / AC (UFO-1-8411)

- Powerful M2 WiFi connection with up to 600mW of power. The M2 is ideal for long-distance links, capable of 100 Mbps+ TCP/IP speed over multi-km distances.

VUT & DrivingRobot Mobile Node - Mesh (UFO-1-8630)

- Mesh network node enables reliable edge connectivity. It uses 2.4-5 GHz dual-band transceiver and is designed for constantly-moving network elements.

4.2 Audiovisual Alarm Detection in VUT #UFO-1-8510

- AVAD 4 System from DTC
- Detector for audio-visual signals from the vehicle
- Windshield mounting kit
- Color and pattern recognition

DRIVINGROBOT

5.1 DrivingRobot modular

DRm150™ (UFO-6-DRm150)

- Steering Robot Modular Unit 150 (SRm150™)
- Pedal Robot Modular Unit
- Seat Rail Mount
- Steering Wheel Adapter
- Isofix Holder
- Control Tablet & Mount
- Network option

DRm60™ (UFO-6-DRm60)

- Steering Robot Modular Unit 150 (SRm60™)
- Pedal Robot Modular Unit
- Seat Rail Mount
- Steering Wheel Adapter
- Isofix Holder
- Control Tablet & Mount
- Network option

5.2 SteeringRobot modular

SRm150 (UFO-6-SRm150)

- Steering Robot Modular Unit 150 (SRm150™)
- Pedal Robot Modular Unit
- Seat Rail Mount
- Steering Wheel Adapter
- Isofix Holder
- Control Tablet & Mount
- Network option

SRm60 (UFO-6-SRm60)

- Steering Robot Modular Unit 60 (SRm60™)
- Pedal Robot Modular Unit
- Seat Rail Mount
- Steering Wheel Adapter
- Isofix Holder
- Control Tablet & Mount
- Network option

DRIVINGROBOT

5.3 PedalRobot modular

PRm (UFO-6-PRm)

- Pedal Robot Modular Unit
- Seat Rail Mount
- Isofix Holder
- Control Tablet & Mount
- Network option

5.4 Steering Wheel Adapter

#UFO-6-0007

- The Steering Wheel Adapter can be mounted on steering wheels with a diameter between 330-550 mm
- The Steering Wheel Adapter is the same for the SRm150™ and SRm60™
- Multiple Steering Wheel Adapters allow to fastly switch between VUTs as mounting can be done in advance

5.5 DrivingRobot GNSS Options

VUT & DrivingRobot GNSS Set (UFO-5-1001)

- GNSS Mounting Plate for Cars
- IMU Mounting Kit
- GNSS Unit RT3000V3

VUT & DrivingRobot Bullet - M2 (UFO-1-8410)

- Powerful M2 WiFi connection with up to 600mW of power. The M2 is ideal for long-distance links, capable of 100 Mbps+ TCP/IP speed over multi-km distances.

VUT & DrivingRobot Mobile Node - Mesh (UFO-1-8630)

- Mesh network node enables reliable edge connectivity. It uses 2.4-5 GHz dual-band transceiver and is designed for constantly-moving network elements

5.6 Audiovisual Alarm Detection in VUT

#UFO-1-8510

- AVAD 4 System from DTC
- Detector for audio-visual signals from the vehicle
- Windshield mounting kit
- Color and pattern recognition

ROBOT INFRASTRUCTURE

6 Robot Infrastructure Set

The infrastructure set contains all components necessary to operate our UFO target carriers. The infrastructure sets are available in two versions: Ubiquiti M2 and Rajant Mesh. Details on the differences between the two are described on the following pages.

6.1 Robot Infrastructure Set - M2 / Mesh

#UFO-1-8550 / #UFO-1-8555

Control Box Set (UFO-1-2160)

- Stationary autonomous unit for the central coordination of the UFO systems
- Transmission of correction data
- Offers an interface to the control computer as well as a stationary emergency stop

Vehicle Box (UFO-1-2130)

- Can be used in the VUT as an interface for GNSS and WiFi data
- Communicates with the Control Box and transmits positioning information and connected device data
- Enables connection to third party equipment

Control Panel Set – M2 (UFO-1-8240-UNIV) / Mesh (UFO-1-8245-UNIV)

- Mobile stand-alone unit for centralized coordination of the UFO system by a single operator
- Allows the adjustment and operation of the UFO carrier platform in manual or automatic mode via UFO operator
- Visualization of the UFO system, mobile phone-based emergency stop

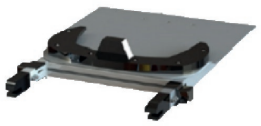
VUT & DrivingRobot Bullet - M2 (UFO-1-8410)
VUT & DrivingRobot Mobile Node - Mesh (UFO-1-8157)
VUT & DrivingRobot Bullet - AC (UFO-1-8411)

- WiFi access point / node for the VUT
- Bullet M2 / ES1 Mesh

ROBOT INFRASTRUCTURE

Isofix Box Holder (UFO-1-8130)

- Designed according to international standard for attachment points for child safety seats in passenger cars
- Used to keep the Vehicle Box positioned in the car



Rugged Outdoor Control Computer - EN / GER (UFO-1-8240-GER/EN)

- Mobile computer for running the UFObase™ Software. Contains Evaluation and Trajectory Generation software
- Robust design and bright screen settings support outdoor usage

Tripod with Rocket – M2 (UFO-1-8150)
Tripod with Node - Mesh (UFO-1-8155)
Tripod with Node - AC (UFO-1-8151)

- The Tripod with Rocket or Mesh node provides a stable WiFi connection to all devices
- It comes with sand bags to achieve high stability

Optional Equipment

Mobile Rocket Mounting Kit (UFO-1-8140)

- Allows the control of 4a remote controller directly from Humanetics Software
- Powered by the control box and ensuring a stable WiFi connection
- Enhances the communication between robots on the proving ground
- Enables fast testing for realistic test scenarios

*Antenna not included

Light Gate Set - M2 (UFO-1-8095-UNIV) / Mesh (UFO-1-8096-UNIV)

- Battery powered Multifunction Box
- Two tripods
- WiFi connection

See the Robot Infrastructure and UFObase™ Control Software in action.

ROBOT INFRASTRUCTURE

Traffic Light Set - M2 (UFO-1-8035-UNIV)
Traffic Light Set - Mesh (UFO-1-8036-UNIV)
Traffic Light Set - AC (UFO-1-8097-UNIV)

- Test-ready indicator
- Can be programmed for driver's view: indicating green (go) when the UFO target carrier is ready; and spectator's view: indicating red do not enter) while the UFO target carrier is in operation
- Charger and software included
- Static object box with two connection ports
- WiFi connection
- Battery powered

See the Traffic Light in action.

Pedestrian Trigger Box Set - M2 (UFO-1-2050)
Pedestrian Trigger Box Set - Mesh (UFO-1-2055)
Pedestrian Trigger Box Set - AC (UFO-1-2051-UNIV)

- Allows the control of 4a remote controller directly from Humanetics Software
- Charger and software included
- WiFi connection
- Battery powered
- Automatic triggering of pedestrian articulation
- Includes a 4a remote controller
- Delivers the most accurate synchronization in the movement of VRU dummies

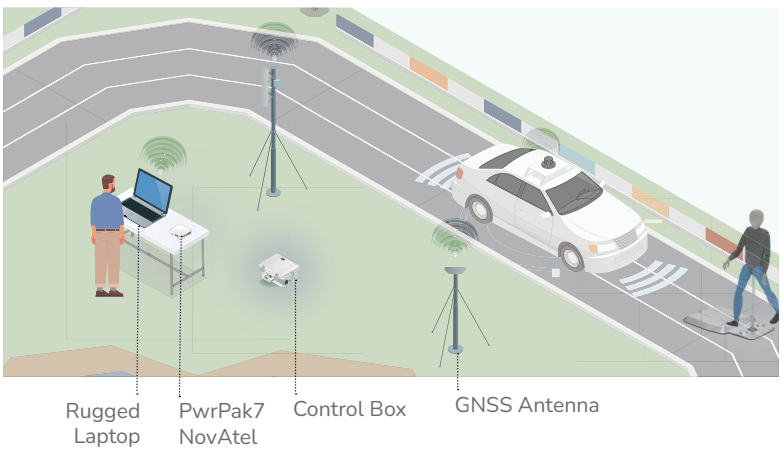
Tripod with Static Node + POE Supply Box Set - Mesh (UFO-1-8156-UNIV)

- A mobile mesh node to extend the existing mesh allowing to cover large area testing
- Battery powered

dGNSS POSITIONING SYSTEMS

Humanetics Standard Solution Integrated dGNSS unit

- Includes dGNSS Base Station with:
  - Integrated dGNSS unit (Novatel)
  - GNSS antenna on tripod with TNC cable
- The PwrPak7 is a compact enclosure that delivers scalable Global Navigation Satellite System (GNSS) with internal storage and INS options



7.1 GNSS Base Station - dGNSS Control Box Extension #UFO-1-8050

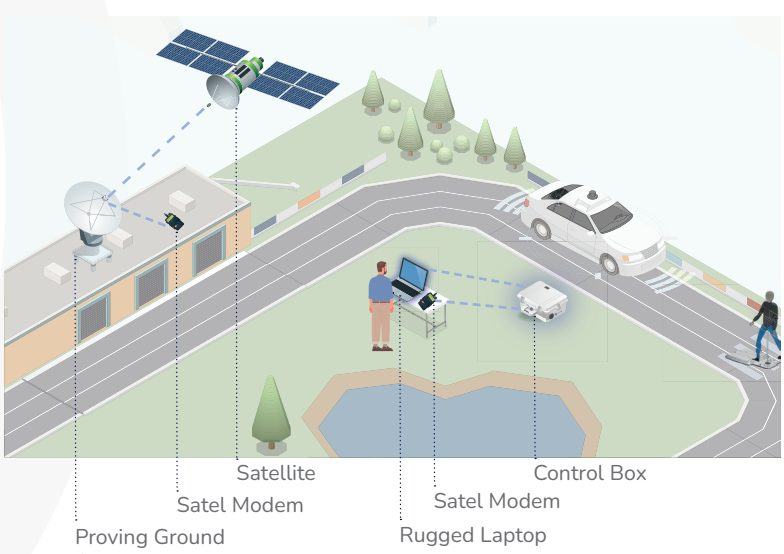
- Requires Robot Infrastructure Set M2 / Mesh
- Integrated dGNSS receiver
- dGNSS correction data is distributed within the UFO WiFi system (radio modem not required)
- dGNSS unit (Novatel) mounted inside Control Box
- Glonass Beidou Galileo incl.
- GNSS antenna on tripod with TNC cable
- Settings via UFO Control Laptop

7.2 GNSS Set - VUT & DrivingRobot #UFO-5-1001

- GPS mounting plate for cars
- IMU mounting kit
- GNSS Unit RT3000V3

Proving Ground Solution

- Satel Modem transmit the data of already installed base stations on the proving ground to the Humanetics Control Box
- Our Humanetics system is tested with following Base Stations:
  - PwrPak7
  - ProPak6
  - RT-Base S
  - Racelogic Vbox RTK-Basisstation



dGNSS POSITIONING SYSTEMS

7.3 Satel Modem Set 400[1] #UFO-1-8800

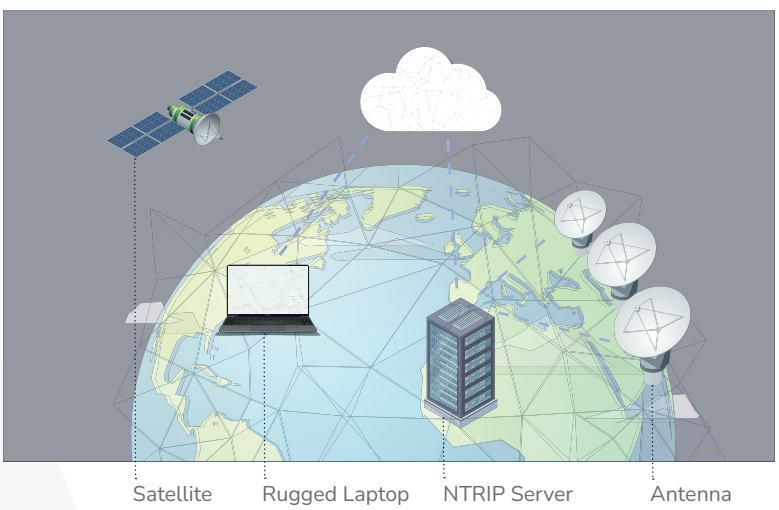
- Two Satel modems for Europe included
- RCTMv3 correction data for all the Humanetics robots involved in testing
- Integrated battery and charger included

7.4 Satel Modem Set 800[1] #UFO-1-8810

- Two Satel modems for Europe included
- RCTMv3 correction data for all the Humanetics robots involved in testing

Nation Wide Solution

- The Networked Transport of RTCM via Internet Protocol (NTRIP) is a protocol for streaming differential GPS (DGPS) corrections over the Internet for real-time kinematic positioning.
- The Humanetics system offer the possibility to receive and use NTRIP correction data



7.5 NTRIP Interface #UFO-1-8560

- Possibility to receive NTRIP correction data
- Other NTRIP client on request
- Lefebure NTRIP Client (others on request)

Note: Local NTRIP data stream subscription not included

[1] Satel Modems are only available to customers located in Europe

SOFTWARE

8 UFObase™ #UFO-1-9060

- Base Software, handles communication, execution of tests, virtual lightgate, simulation, simple trajectory generator

8.1 Basic Software Bundle #UFO-1-9340-BP

UFObase™ (UFO-1-9060)

- Base Software, handles communication, execution of tests, virtual lightgate, simulation, simple trajectory generator

Synchronized Virtual Lightgate Feature (UFO-1-9010)

- Enables the UFO to adjust longitudinal and lateral position relative to the VUT as soon as the VUT passes the virtual light gate
- Speed of UFO target carrier is synchronized with test vehicle speed at all times (for accurate point of impact)
- Enables maximum accuracy and repeatability of longitudinal lateral test scenarios
- Beneficial and helpful in windy testing conditions or with manual driven VUT

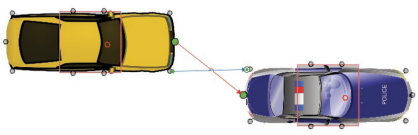
See the Full Synchronization Software in action.

Data Forwarding Feature (UFO-1-9030)

- The data from the robot can be transferred directly to the VUT during the test through a CAN port (either through the Vehicle Box or through the DrivingRobot Box)
- It includes position data, velocity data, acceleration data, NCOM data and CAN-DBC file

Distance Calculation Feature (UFO-1-9040)

- Calculates distances of manually defined positions of robots and VUTs
- Real-time display of distances between measurement points
- Calculates time to collision



See the Range Functionality & Predefined Scenario Library in action.

Event Trigger Handling Feature (UFO-1-9300)

SOFTWARE

UFO as Master Vehicle Feature (UFO-1-9160)

- UFO target carrier can be used as leading vehicle with the DrivingRobot as the following vehicle
- Enables to conduct scenarios also with limited space on the proving ground

See the UFO target carrier as Master Vehicle in action.

Teachmode Feature (UFO-1-9290)

- A trajectory can be driven by the VUT and assigned as a test path for future vehicles or platforms to run, allowing you to drive and record a complicated path instead of building out the entire scenario in a trajectory program.

Trajectory Generator (UFO-1-9210)

- User-friendly trajectory generator for UFObase scenarios
- Quick trajectory generation with predefined NCAP scenarios and easy scenario adaption

8.2 Scenario Scripting Bundle #UFO-1-9350-BP

Advanced Scenario Scripting Feature (UFO-1-9170)

- New way to draw test scenarios with multiple test phases (UFObase Scenario (UBS))

Trigger Edit Feature (UFO-1-9280)

- Enables the user to define specific trigger conditions to create more complex scenarios

8.3 NCAP Library Subscription - UFO only #UFO-1-9230-S

- New way to draw test scenarios with multiple test phases (UFObase Scenario (UBS))
- Simplifies the process of configuring tests on the proving ground and staying up to date with the latest test scenarios by providing a comprehensive collection of pre-configured tests
- Quickly and easily set up test scenarios, saving time and reducing the risk of errors.
- Covering over 1100 NCAP scenarios and driving conditions to ensure that your ADAS systems are tested to the highest standards
- Subscription model ensures that new tests are uploaded as soon as they are published, making sure you have the latest test configurations installed for UFOs

SOFTWARE

8.4 NCAP Library Subscription - UFO only + DrivingRobot #UFO-1-9240-S

- Enables the user to define specific trigger conditions to create more complex scenarios
- Simplifies the process of configuring tests on the proving ground and staying up to date with the latest test scenarios by providing a comprehensive collection of pre-configured tests
- Subscription model ensures that new tests are uploaded as soon as they are published, making sure you have the latest test configurations installed for UFOs and DrivingRobot

8.5 Test Evaluation and Reporting Suite – UFO only #UFO-1-9140

- Validates and evaluates test results for Euro NCAP Scenarios
- Evaluation possible with third party testing systems on request
- Automatically generates Euro NCAP conform MME reports

8.6 Test Evaluation and Reporting Suite – UFO + DrivingRobot #UFO-1-9150

- Validates and evaluates test results for Euro NCAP Scenarios
- Evaluation possible with third party testing systems on request
- Automatically generates Euro NCAP conform MME reports

See the Test Evaluation & Reporting Suite in action.

SOFTWARE

8.7 DrivingRobot Software Bundle #UFO-1-9360-BP

DrivingRobot Friction Compensation Feature (UFO-1-9190)

- Reduces the friction of the DrivingRobot, in test scenarios where the steering is actively intervening
- Can be tuned in several modes.
- Needed for Euro NCAP LSS scenarios

Audiovisual Alarm Detection Interface Feature (UFO-1-9180)

- Needed for Forward Collision Warning and Blindspot Tests
- Signals from AVAD System are sent to Humanetics Software and used for advanced scenario control (FCW-Tests, Blindspot)
- Trigger signals from AVAD are saved as part of Humanetics result files
- Possibility to integrate AVAD 2/3/4 with Humanetics DrivingRobot

Manual Speedup Feature(UFO-1-9270)

- Developed for testing cars with manual gearbox
- VUT is accelerated manually and then transferred to the DrivingRobot

8.8 TrackBase Analyze™ #UFO-1NB-9275-S

- Runs automatic platform system check runs to detect potential problems early on
- Predictive Maintenance enables proactive issue resolution
- Offers over 100 actionable insights to resolve issues

8.9 TrackBase Connect®

- Customized solution for managing proving ground activities
- Enables visualization of the proving ground and zone bookings for optimal resource utilization
- Enables integration of various infrastructures, such as traffic systems, weather stations, ISO22133 compliant ADAS equipment

DELIVERY

9.1 Online Training at Delivery #UFO-1-7200

- Detailed user manual
- Best practice guidelines and installation videos
- Online Training included with each robot
  - Good Internet connection at proving ground is required
  - Portable video device with Microsoft Teams is recommended

Online training is not available in the US

9.2 Factory Delivery* #UFO-1-7160

- Detailed user manual
- Best practice guidelines
- Installation videos
- Visit to the Linz Humanetics active safety development center
- Theoretical training
- Sessions on the proving ground

Factory delivery is not available in the US

9.3 Elite Delivery* #UFO-1-7210

- Detailed user manual
- Best practice guidelines
- Installation videos
- Customer site visits with on-site training with a Humanetics training engineer
- Sessions on the proving ground

* Price on demand

SERVICE PACKAGES

9.4 Standard Service Package #UFO-1-7510

- Remote support
- Software update

9.5 Professional Service Package #UFO-1-7340

- Covering simple robot service requirements
- Remote support
- Annual robot service
- Annual battery health-check
- Software update

9.6 Premium Service Package* #UFO-1-7360

- Includes the benefits of the Professional Service Package and beyond
- Covering all customer needs for a carefree and smooth working day
- Priority ticket system and remote support
- Annual robot service and battery health-check
- Software update
- Access to pool equipment
- Loan platform during service and repair
- Spare parts frame contract

*Premium service package is not available in the US

ACTIVE SAFETY ACADEMY

10.1 Academy Training - Basic #UFO-1-7675

- Includes general safety information as well as battery information and an overview of infrastructure set-ups and software options

10.2 Academy Training - Basic UFOpro® Package #UFO-1-7676

- General hardware information about the UFOpro® including Setup, assembly/extensions, application of targets and battery change

10.3 Academy Training - Basic UFOmicro® Package #UFO-1-7677

- General hardware information about the UFOmicro® including Setup, assembly/extensions, application of targets and battery change

10.4 Academy Training - Basic UFOnano® Package #UFO-1-7678

- General hardware information about the UFOnano® including Setup, assembly/extensions, application of targets and battery change

TARGET OPTIONS

11.1 Passenger Vehicle 3D Target (GVT) REF. F

#UFO-1-5010

- Compatible with UFOpro® and UFOpro *Black Series*
- Modeled after Ford Fiesta
  - Realistically replicates radar and visual properties of a real car

11.2 Passenger Vehicle 3D Target (GVT) REF. G

#UFO-1-5110

- Can be used for Euro NCAP CCR evaluations, CCFtap scenarios as well as internal development
- Greater stability provided by additional central frame supports

11.3 Stationary Stand for Passenger Vehicle 3D Target

#UFO-1-5080

- Used for stationary tests
- Fits Passenger Vehicle 3D Target REF. F and REF. G

11.4 Pedestrian Dummy - Adult Articulating (EPTa)[2]

#UFO-1-5290

- Euro NCAP-compliant adult pedestrian target from MESSRING
- Replicates human properties in size and shape, with articulating legs
- Articulated EPT – Euro NCAP Pedestrian Target
- Web based control, no remote control required
- IMU-trigger (acceleration sensor)
- Leg movement starts automatically when the platform accelerates
- Very robust design

[2] Image MESSRING GmbH

TARGET OPTIONS

11.5 Pedestrian Dummy - Child Articulating (EPTc)[2] #UFO-1-5300

- Euro NCAP-compliant child pedestrian target from MESSRING
- Articulated EPT – Euro NCAP Pedestrian Target
- Web based control, no remote control required
- IMU-trigger (acceleration sensor)
- Leg movement starts automatically when the platform accelerates
- Very robust design

11.6 Bicyclist Adult Target (EBTa)[2] #UFO-1-5030

- Full Adult Bicycle target Package includes: bicycle, human dummy, 3x wheels, 15x spokes from 4activeSystem and MESSRING
- Compliant with Euro NCAP VRU testing protocols
- Rotating wheels
- Adjustable torso position (aero, upright)
- Crashable up to 60 km/h
- Water resistant

11.7 Bicycle Dummy Child[1] #UFO-1-5035

- Euro NCAP-compliant child bicyclist target from 4activeSystems
- Represents a 6-7 year old child with articulating legs
- Robust and modular system – easy and fast change of spare parts
- Crashable up to 60 km/h

11.8 Pedestrian Dummy - Adult Articulating (EPTa)[1] #UFO-1-5050

- Euro NCAP-compliant adult pedestrian target from 4activeSystems and MESSRING
- Replicates human properties in size and shape, with articulating legs
- Articulated EPT – Euro NCAP Pedestrian Target
- Homogeneous distribution of radar cross section (RCS)
- Visual signature – mono and stereo camera
- Crashable up to 60 km/h
- Water resistant

Note: articulation with UFO-1-2050 Pedestrian trigger Box or 4a remote controller to be provided by customer

[1] Image 4activeSystems GmbH
[2] Image MESSRING GmbH

TARGET OPTIONS

11.9 Pedestrian Dummy - Child Articulating (EPTc)[1] #UFO-1-5070

- Euro NCAP-compliant child pedestrian target from 4activeSystems and MESSRING
- Represents a 7 year old child with articulating legs
- Articulated EPT – Euro NCAP Pedestrian Target
- Homogeneous distribution of radar cross section (RCS)
- Visual signature – mono and stereo camera
- Crashable up to 60 km/h
- Water resistant

Note: articulation with UFO-1-2050 Pedestrian trigger Box or 4a remote controller to be provided by customer

11.10 European Motorcycle Target & Stands (PTW)[1] #UFO-1-5140

- Corresponding to category L3 as applied by UNECE
- Realistic properties in size and shape and rotational features
- Compliant to ISO 19206-5 WD, Euro NCAP
- Compatible with UFOmicro® target carrier
- Crash speed lateral up to 60 km/h / longitudinal up 50 + 20 km/h

11.11 E-Scooter CNCAP Target (PTW)[1] #UFO-1-5150

- Compatible with UFOmicro® target carrier
- Crash speed lateral up to 60 km/h / longitudinal up to 40 km/h
- Corresponding to category L3e-A1 as applied by UNECE

11.12 Motorcycle Stands (PTW) #UFO-1-5140-6001

- Needed for the usage of the PTW targets like E-Scooter (10.8) or European Motorcycle Target (10.7)

[1] Image 4activeSystems GmbH

TARGET OPTIONS

11.13 Playing Child Target (PCT)[2] #UFO-1-5180

- Target in the shape of a two-year-old child sitting on a play car
- Available in different colors
- Compatible with UFOnano® target carrier and UFOmicro® with VRU extension
- Dimension: 680 x 580 x 360 mm | Weight: 2.2 kg

11.14 Standing Scooter Target (SST)[2] #UFO-1-5190

- Target in the shape of a young woman (P50 median female)
- Compatible with UFOnano® target carrier and UFOmicro® with VRU extension
- Realistic sensor response for radar, camera, lidar, ultrasound and IR
- Dimension: 1660 x 1050 x 415 mm | Weight: 5.6 kg

12.1 UFO Service Carrier #UFO-1-6060

- Manual hydraulic lifting device for transportation; can be used as a service table
- Net weight: 138 kg | Carrying capacity: 500 kg
- Dimension (table top): 800x1600 mm
- Lifting height: 310 - 900 mm
- Stroke/step: 25 mm
- For UFOpro®, UFOpro *BlackSeries*, UFOmicro® and UFOnano®

[2] Image MESSRING GmbH

PRODUCT **LIST**

POS	PART NUMBER	DESCRIPTION
UFOpro®		
1	UFO-2	UFOpro® - Core
1	UFO-3	UFOpro® Black Series - Core
1.1	UFO-1-1010-0051	UFOpro® - Standard Ramps
1.1	UFO-1-1020-0021	UFOpro® - Heavy Duty Ramps
1.2	UFO-2-1001	UFOpro® - WiFi - M2
1.2	UFO-2-1005	UFOpro® - WiFi - AC
1.2	UFO-2-1002	UFOpro® - WiFi - Mesh
1.3	UFO-1-8320	UFOpro® - ABS Set
1.3	UFO-1-1040-0042	UFOpro® - Arrow Ramp Set
1.3	UFO-1-3010	UFOpro® - Battery
1.3	UFO-1-3080	UFOpro® - Battery Heavy Duty Version
1.3	UFO-1-2220	UFOpro® - Battery Transport Box
UFOmicro®		
2	UFO-8	UFOmicro® - Core
2.1	UFO-8-1001	UFOmicro® - WiFi - M2
2.1	UFO-8-1002	UFOmicro® - WiFi - Mesh
2.1	UFO-8-1003	UFOmicro® - WiFi - AC
2.2	UFO-9-0219	UFOmicro® - GNSS - SBG
2.2	UFO-9-0181	UFOmicro® - GNSS - OxTS
2.3	UFO-8-1100	UFOmicro® - VRU Extension
2.3	UFO-8-1200	UFOmicro® - PTW Extension
2.4	UFO-8-3170	UFOmicro® - Battery
2.4	UFO-1-6120	UFOmicro® - Battery Transport Box
UFOnano®		
3	UFO-9	UFOnano® - Core
3.1	UFO-9-1001	UFOnano® - WiFi - M2
3.1	UFO-9-1006	UFOnano® - WiFi - AC
3.1	UFO-9-1002	UFOnano® - WiFi - Mesh
3.2	UFO-9-0219	UFOnano® - GNSS - SBG
3.2	UFO-9-0181	UFOnano® - GNSS - OxTS
3.3	UFO-1-3160	UFOnano® - Battery Set

PRODUCT LIST

POS	PART NUMBER	DESCRIPTION
DrivingRobot compact		
4	UFO-5	DrivingRobot compact
4	UFO-5-1001	VUT & DrivingRobot GNSS Set
4.1	UFO-1-8410	VUT & DrivingRobot Bullet - M2
4.1	UFO-1-8411	VUT & DrivingRobot Bullet - AC
4.1	UFO-1-8630	VUT & DrivingRobot Mobile Node - Mesh
4.2	UFO-1-8510	Audiovisual Alarm Detection in VUT
DrivingRobot modular		
5.1	UFO-6-DRm150	DRm150™
5.1	UFO-6-DRm60	DRm60™
5.2	UFO-6-SRm150	SRm150
5.2	UFO-6-SRm60	SRm60
5.3	UFO-6-PRm	PRm
5.4	UFO-6-0007	Steering Wheel Adapter
5.5	UFO-5-1001	VUT & DrivingRobot GNSS Set
5.5	UFO-1-8410	VUT & DrivingRobot Bullet - M2
5.5	UFO-1-8630	VUT & DrivingRobot Mobile Node - Mesh
5.6	UFO-1-8510	Audiovisual Alarm Detection in VUT
Robot Infrastructure Set		
6.1	UFO-1-8550	Robot Infrastructure Set - M2
6.1	UFO-1-8555	Robot Infrastructure Set - Mesh
6.1	UFO-1-2130	Vehicle Box
6.1	UFO-1-8240-UNIV	Control Panel Set – M2
6.1	UFO-1-8245-UNIV	Control Panel Set – Mesh
6.1	UFO-1-8410	VUT & DrivingRobot Bullet - M2
6.1	UFO-1-8411	VUT & DrivingRobot Bullet - AC
6.1	UFO-1-8157	VUT & DrivingRobot Mobile Node - Mesh
6.1	UFO-1-8130	Isofix Box Holder
6.1	UFO-1-8240-GER/EN	Rugged Outdoor Control Computer - EN / GER
6.1	UFO-1-8150	Tripod with Rocket – M2
6.1	UFO-1-8155	Tripod with Rocket – AC
6.1	UFO-1-8155	Tripod with Node - Mesh
6.1	UFO-1-8140	Mobile Rocket Mounting Kit
6.1	UFO-1-8095-UNIV	Light Gate Set - M2
6.1	UFO-1-8096-UNIV	Light Gate Set - Mesh
6.1	UFO-1-8035-UNIV	Traffic Light Set - M2
6.1	UFO-1-8097-UNIV	Traffic Light Set - AC

PRODUCT LIST

POS	PART NUMBER	DESCRIPTION
6.1	UFO-1-8036-UNIV	Traffic Light Set - Mesh
6.1	UFO-1-2050	Pedestrian Trigger Box Set - M2
6.1	UFO-1-2051-UNIV	Pedestrian Trigger Box Set - AC
6.1	UFO-1-2055	Pedestrian Trigger Box Set - Mesh
6.1	UFO-1-8156-UNIV	Tripod with Static Node + POE Supply Box Set - Mesh
dGNSS		
7.1	UFO-1-8050	GNSS Base Station - dGNSS Control Box Extension
7.2	UFO-5-1001	GNSS Set - VUT & DrivingRobot
7.3	UFO-1-8800	Satel Modem Set 400, only available in Europe
7.4	UFO-1-8810	Satel Modem Set 800, only available in Europe
7.5	UFO-1-8560	NTRIP Interface
SOFTWARE		
8	UFO-1-9060	UFObase™ - Core
8.1	UFO-1-9340-BP	Basic UFO Software Bundle
8.1	UFO-1-9010	Synchronized Virtual Lightgate Feature
8.1	UFO-1-9030	Data Forwarding Feature
8.1	UFO-1-9040	Distance Calculation Feature
8.1	UFO-1-9300	Event Trigger Handling Feature
8.1	UFO-1-9160	UFO as Master Vehicle Feature
8.1	UFO-1-9290	Teachmode Feature
8.1	UFO-1-9210	Trajectory Generator
8.2	UFO-1-9350-BP	Scenario Scripting Bundle
8.2	UFO-1-9170	Advanced Scenario Scripting Feature
8.2	UFO-1-9280	Trigger Edit Feature
8.3	UFO-1-9230-S	NCAP Library Subscription - UFO only
8.4	UFO-1-9240-S	NCAP Library Subscription - UFO + Driving Robot
8.5	UFO-1-9140	Test Evaluation and Reporting Suite – UFO only
8.6	UFO-1-9150	Test Evaluation and Reporting Suite – UFO + Driving Robot
8.7	UFO-1-9360-BP	Driving Robot Software Bundle
8.7	UFO-1-9190	DrivingRobot Friction Compensation Feature
8.7	UFO-1-9180	Audiovisual Alarm Detection Interface Feature
8.7	UFO-1-9270	Manual Speedup Feature
8.8	UFO-1NB-9275-S	TrackBase Analyze™
8.9		TrackBase Connect®

PRODUCT LIST

POS	PART NUMBER	DESCRIPTION
DELIVERY & SERVICE		
9.1	UFO-1-7200	Online Training at Delivery
9.2	UFO-1-7160	Factory Delivery
9.3	UFO-1-7210	Elite Delivery
9.4	UFO-1-7510	Standard Service Package
9.5	UFO-1-7340	Professional Service Package
9.6	UFO-1-7360	Premium Service Package
ACADEMY		
10.1	UFO-1-7675	Academy Training - Basic
10.2	UFO-1-7676	Academy Training - Basic UFOpro® Package
10.3	UFO-1-7677	Academy Training - Basic UFOmicro® Package
10.4	UFO-1-7678	Academy Training - Basic UFOnano® Package
TARGETS		
11.1	UFO-1-5010	Passenger Vehicle 3D Target (GVT) REF. F
11.2	UFO-1-5110	Passenger Vehicle 3D Target (GVT) REF. G
11.3	UFO-1-5080	Stationary Stand for Passenger Vehicle 3D Target
11.4	UFO-1-5290	Pedestrian Adult Target Articulation (EPTa)
11.5	UFO-1-5300	Pedestrian Child Target Articulation (EPTc)
11.6	UFO-1-5030	Bicyclist Adult Target (EBTa)
11.7	UFO-1-5035	Bicyclist Child Target (EBTc)
11.8	UFO-1-5050	Pedestrian Adult Target Articulation (EPTa)
11.9	UFO-1-5070	Pedestrian Child Target Articulation (EPTc)
11.10	UFO-1-5140	European Motorcycle Target & Stands (PTW)
11.11	UFO-1-5150	E-Scooter CNCAP Target (PTW)
11.12	UFO-1-5140-6001	Motorcycle Stands (PTW)
11.13	UFO-1-5180	Playing Child Target (PCT)
11.14	UFO-1-5190	Standing Scooter Target (SST)
12.1	UFO-1-6060	UFO Service Carrier

* Delivery and service options are not available in the US

All prices are in EUR and do not contain any taxes or duties. All products are designed and produced according to European standards. Buyer is responsible for compliance with local safety and environmental requirements.

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