4active ctive
SYSTEMS

WE TRUST 4a

2

IN PHYSICS WE TRUST

4active**Systems**

4activeSystems is one of the world's leading companies for active vehicle safety, focusing on advanced dummy objects and test systems for the evaluation and development of AEB/AES-systems and autonomous driving vehicles.

Since 2006, we have been delivering innovative solutions and products that have become global standards.

Our high-quality products „Made in Austria" combined with excellent support make us a reliable partner for vehicle manufacturers, test labs and automotive suppliers worldwide.

Our team consists of highly qualified, passionate employees with excellent know how in physics, electronics, mechatronics and material science.

4active**FB**-eco

Highly automated robotic platforms for future ADAS and AD testing

- ☑ precise dynamic Swarm-trajectories, live monitoring and auto-reporting
- ☑ open interfaces (OTX) and extensive connectivity (Mesh)
- ☑ designed according to Euro NCAP VRU and related ISO-standards

The world lowest profile robotic platform with maximum performance

- ☑ extrem low profile (20-35 mm) and zero radar reflectivity
- ☑ precise dual antenna dGNSS/IMU (GPS RTK-L2, GLONASS, Beidou, Galileo)
- ☑ speeds up to 30 km/h with high accelerations +3 m/s² and -5 m/s²

Highest efficiency under rough conditions

- ☑ autonomous fast charging technology - 10 min charging / 2-5 h testing
- ☑ traversable by heavy vehicles - trucks (40 tons) – protection class IP67
- ☑ automatic target adaption and intuitive operation

V.2.0
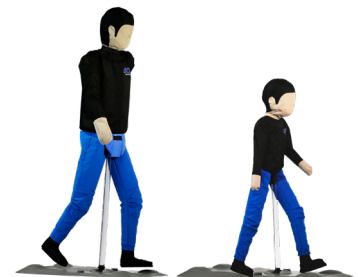
4active**FB**-eco

Performance

maximum speed	5 / 8 / 10 / 20 / 30 km/h
acceleration	3 m/s² and -5 m/s² ★
accuracy	up to 2 cm
GNSS / inertialsystem	dual antenna IMU/dGNSS (GPS RTK-L2, GLONASS, Beidou, Galileo)
battery system	LTO 20 Ah – autonomous fast charging
drive system	1000 W dual power drive units
communication	WLAN mesh system
control software	4a Control (DEMO, CERT, NCAP, SWARM)
remote control	ruggedized outdoor safety panel
maximum overrung weight	8000 kg per wheel

★ Euro NCAP-compliant incl. EPT, EBT mounted

Dimensions

length	1000 mm
width	600 mm
chassis height	20-35 mm
weight	20 kg

Model types

☑ 4activeFB-eco - DEMO: 8 km/h - selected VRU trajectories for demo events
☑ 4activeFB-eco - CERT: 20 km/h - specifically for certification inspections
☑ 4activeFB-eco - NCAP: 10 / 20 km/h - acceleration (+3m/s²) acc. Euro NCAP 2020
☑ 4activeFB-eco - SWARM: 30 km/h - dynamic Swarm-trajectories

4active**FB**-small

Designed according to Euro NCAP VRU specifications

☑ height and ground clearance for pedestrian targets (EPT)
☑ wheels of bicyclist target (EBT) have permanent contact to ground
☑ RCS levels according to international standards/test protocols

Fully synchronized operation with all relevant driving robots

☑ real time position data from/to robot - import/export drive files
☑ corrects LAT/LONG waypoint errors of driving robots (VUT)
☑ full synchro mode - synchronization of 5 independent platforms

Allows testing under rough conditions

☑ traversable by heavy vehicles - trucks (40 tons)
☑ waterproof with IP67 protection
☑ precise performance at high speeds (up to 80 km/h)

4active**FB**-small

Performance

speed levels	30/50/80 km/h
acceleration longitudinal	+ 3 m/s² / - 5 m/s² ★
acceleration lateral	± 3 m/s²
turning radius	0.5 m
ground clearance	0-7 mm
maximum payload	30 kg
battery charging time	~ 1h ★★
battery operating time	EPT > 6h / EBT > 3h / PTW >1 h(@50 km/h) ★★★
positioning system	dual antenna dGNSS-IMU
dGNSS-RTK	L1/L2 GPS/GLONASS/BEIDOU
protection class	IP67
operation temperature range	-10° to 40° C (-20° to 55° C) ★★★★

★ depends on speed ★★ at 20°C ★★★ depending on acceleration ★★★★ additional test equipment available

Dimensions

length	2200 mm
width	900 mm
weight	55 kg
transport dimensions	1490 x 950 x 90 mm

Key features

- ☑ fast and easy battery swap system
- ☑ easy and efficient testing under worst conditions
- ☑ stealth technology - very low radar cross section
- ☑ traversable with full loaded 40 tons trucks

4active**FB**-large

The best global solution fulfilling all Euro NCAP C2C specifications

- ☑ to perform AEB/AES – CCRx and LSS scenarios
- ☑ compatible with vehicle target (GVT)
- ☑ very low RCS levels according to international standards/test protocols

Fully synchronized operation with all relevant driving robots

- ☑ real time position data from/to robot - import/export drive files
- ☑ corrects LAT/LONG waypoint errors of driving robots (VUT)
- ☑ full synchro mode - synchronization of 5 independent platforms

Allows testing under rough conditions

- ☑ traversable by heavy vehicles - trucks (40 tons)
- ☑ waterproof with IP67 protection
- ☑ precise performance at high speeds (up to 100 km/h)

4active**FB**-large

Performance

speed levels	50/80/100 km/h
acceleration longitudinal	+ 3m/s² / - 6 m/s² ★
acceleration lateral	± 3 m/s²
turning radius	7 m
ground clearance	0-15 mm
maximum payload	150 kg
battery charging time	~ 1 h ★★
battery operating time	4a GVT > 4h (@50 km/h)★★★
positioning system	dual antenna dGNSS-IMU
dGNSS-RTK	L1/L2 GPS/GLONASS/BEIDOU
protection class	IP67
operation temperature range	-10° to 40° C (-20° to 55° C) ★★★★

★depends on speed ★★at 20°C ★★★depending on acceleration ★★★★additional test equipment available

Dimensions

length	2400 mm
width	1400 mm
weight	155 kg

Key features

- ☑ fast and easy battery swap system
- ☑ easy and efficient testing under worst conditions
- ☑ stealth technology - very low radar cross section
- ☑ traversable with full loaded 40 tons trucks
- ☑ Euro NCAP scenarios: AEB-CCRs/CCRm/CCRb, CCFtap, ELK, LSS

4active**SB**

The propulsion system for Euro NCAP VRU

☑ to perform all AEB/AES-VRU test scenarios
☑ platform speed up to 20 km/h - correction of velocity via GPS
☑ complies with ISO 19237, ISO 22078, Euro NCAP, JNCAP, CNCAP, ...

Full synchro mode with all relevant driving robots and dGNSS-systems

☑ real time position data from/to robot - import/export drive files
☑ corrects LAT/LONG waypoint errors of driving robots (VUT)
☑ full synchro mode for a very accurate collision point

Easy transport and quick set up

☑ fast installation in about 30 min
☑ battery powered system - operating time up to 8 h
☑ active unlocking system to release the target before impact

V.1.0
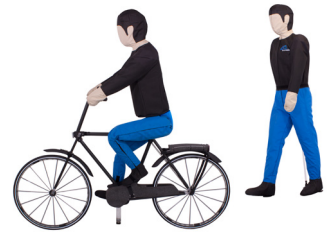
4active**SB**

Performance

vehicle speed	100 km/h
platform speed	20 km/h
acceleration	3.5 m/s²
system length crossing	35 m
system length longitudinal	50 m
power supply	110-230 VAC / 50-60Hz

Dimensions

weight driving unit	85 kg
weight deflection unit	60 kg
weight platform	12 kg
hight platform	25 mm

Euro NCAP scenarios

CPFA	✔
CPNA / CPNC / CBNA	✔
CPLA / CBLA	✔
CPTA / CPRA	✔

Key features

- ☑ fully compatible with all relevant robots/dGNSS-systems
- ☑ easy and fast assembly/disassembly
- ☑ easy operation via WLAN (laptop, control panel)
- ☑ automatic triggering of dummy articulations
- ☑ protection class: IP 54

4active**XB**

The propulsion system for Euro NCAP VRU

☑ to perform all AEB/AES-VRU test scenarios
☑ platform speed up to 50 km/h - correction of velocity via GPS
☑ complies with ISO 19237, ISO 22078, Euro NCAP, JNCAP, CNCAP, ...

Full synchro mode with all relevant driving robots and dGNSS-systems

☑ real time position data from/to robot - import/export drive files
☑ corrects LAT/LONG waypoint errors of driving robots (VUT)
☑ full synchro mode for a very accurate collision point
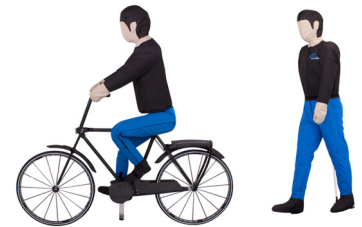
Easy transport and quick set up

☑ fast installation in about 30 min
☑ low power needed - supercapacitors
☑ fully compatible with all driving robots/dGNSS-systems

4active**XB**

Performance

vehicle speed	100 km/h
platform speed	50 km/h
acceleration	3.5 m/s²
system length crossing	65 m
system length longitudinal	50 m
power supply	110-230 VAC / 50-60Hz

Dimensions

weight driving unit	208 kg
weight deflection unit	135 kg
weight platform	12 kg
hight platform	25 mm

Euro NCAP scenarios

CPFA	✔
CPNA / CPNC / CBNA	✔
CPLA / CBLA	✔
CPTA / CPRA	✔

Key features

☑ fully compatible with all relevant robots/dGNSS-systems
☑ easy and fast assembly/disassembly
☑ easy operation via WLAN (laptop, control panel)
☑ automatic triggering of dummy articulations

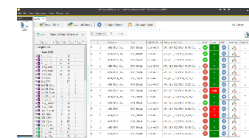# 4active**EQ** - AVL Smart ADAS Analyzer

The best solution to support the workflow for NCAP and active safety testing

☑ independent, open solution for evaluation and reporting of active safety tests
☑ validates high rated NCAP results in a very short cycle
☑ always up-to-date databases for rapidly changing test requirements

Providing highest level of user friendliness

☑ workflow optimized user interface for faster results
☑ open interfaces and seamless integration into 4activeSystems test equipment
☑ pre-defined set of NCAP report templates
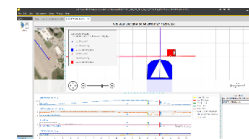
Precise - reliable - efficient

☑ fully automated import, validation and scoring of test data
☑ instantaneous online validation of ADAS (e.g. NCAP) tests during test execution
☑ sophisticated and well-proven data processing core
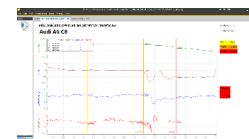
4active**EQ** - AVL Smart ADAS Analyzer

Supported protocols & report templates

EU-NCAP 2019	AEB/FCW City, AEB/FCW Inter-Urban, AEB/FCW VRU-Pe, AEB/FCW VRU-Cy, LDW, LKA, ELK
EU-NCAP 2020	AEB/FCW Car-to-Car, AEB/FCW VRU-Pe, AEB/FCW VRU-Cy, LDW, LKA, ELK
A-NCAP 2020	AEB/FCW Car-to-Car, AEB/FCW VRU-Pe, AEB/FCW VRU-Cy, LDW, LKA, ELK
C-NCAP 2021	AEB/FCW Car-to-Car, AEB/FCW VRU-Pe, AEB/FCW VRU-TW, LKA, LDW
C-IASI 2018	AEB/FCW Car-to-Car

Reporting standards

EU-NCAP	Excel & MME
A-NCAP	Excel & MME
C-NCAP	Excel
C-IASI	Excel

Key features

☑ pre-configured test plans
☑ instant test validation and scoring
☑ automatic failure detection
☑ ready to use report templates

AVL

4active**DR**-Driving Robot

highly advanced system for computer controlled driving of cars & trucks

☑ drives the vehicle by operating the steering wheel, accelerator and brake pedal
☑ providing lateral and/or longitudinal closed-loop or open-loop operation modes
☑ to perform standard and customized test procedures with robotic precision

providing the highest level of user friendliness

☑ very flexible and comfortable user interface
☑ highly performant robot control software
☑ modular actuator design and flexible application software

precise - reliable - efficient

☑ designed for a fast installation into vehicles without changes to the car
☑ compact, lightweighted and ruggedized components - each component < 10 kg
☑ only quick teach-in set-up - no calibration required

4active**DR**-Driving Robot

steering actuator

	ADAS/ NCAP config.	High Dynamic config.
nominal load point	10 Nm @ 720 °/sec	60 Nm @ 1280 °/sec
max. speed	750 °/sec	1700 °/sec
max. torque	30 Nm	75 Nm

- ☑ steering wheel diameter range - app. 377 – 405 mm
- ☑ torque support on driver'side
- ☑ uncovered airbag area
- ☑ handle bars for the driver

throttle actuator

angle	90°max.
torque	15 Nm (nom), 30 Nm (max)
velocity	330 °/s max.

- ☑ lays on pedal (free access to human foot)
- ☑ adjustable position

brake actuator

	ADAS/NCAP config.	High Dynamic config.
stroke	150 mm max.	150 mm max.
force	350 N max.	1.800 N max.
velocity	0.4 m/s max.	2.1 m/s max.

- ☑ pneumatical brake redundancy upon request
- ☑ clamping attachment, no drills

Key extensions

- ☑ clutch + shift robot for manual transmission
- ☑ truck adapter set
- ☑ driverless add-ons with brake redundancy
- ☑ keyboys for starting / stopping engine

STÄHLE
ROBOT SYSTEMS
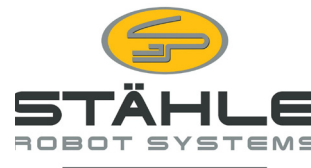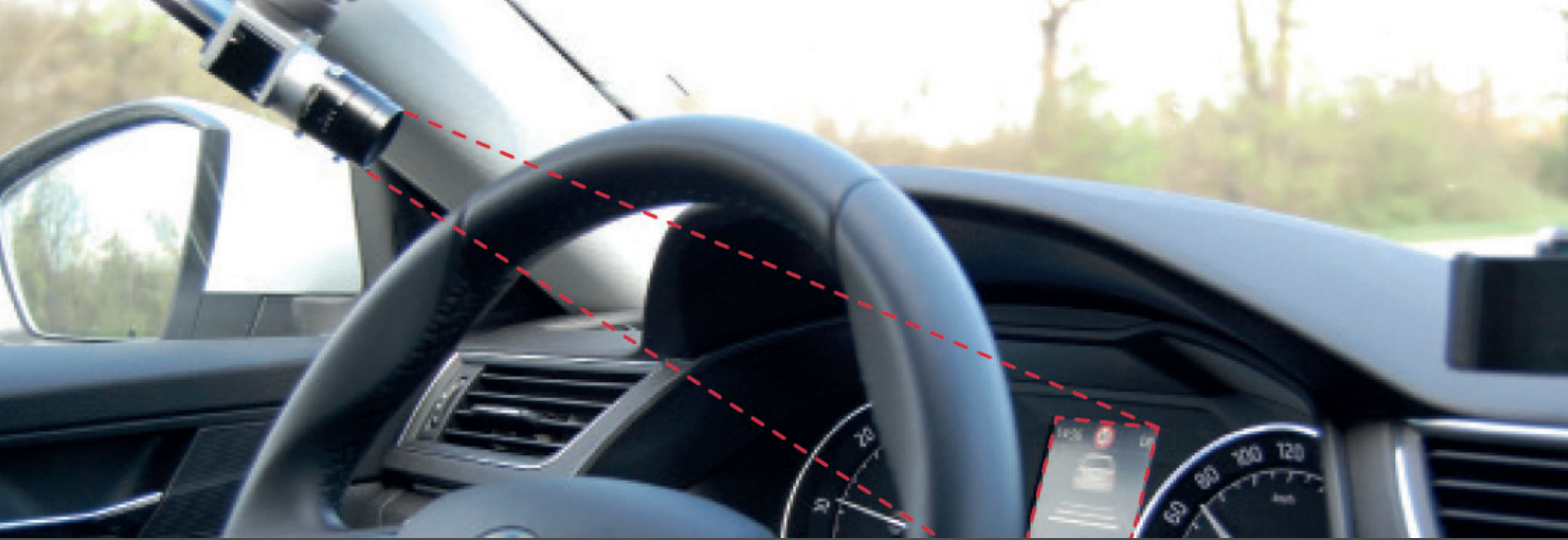
4active**EQ**-AVAD 3

Detector for audio/visual signals from the vehicle

☑ detects acoustic and optical warnings and messages from inside the vehicle
☑ using high-performance camera and microphone
☑ ideally suited for AEB, FCW, SAS, LSS in compliance with EuroNCAP

Successfully used by most manufacturers, OEMs and test laboratories

☑ very fast, top-quality processor for sound and image processing
☑ up to 8 patterns, colours and colour search areas - up to 100 simultaneous tones
☑ different software feature codes available

Precise - reliable - efficient

☑ easy handling and easy system configuration
☑ triggers corresponding trigger signals within a few milliseconds
☑ measurement profiles can be saved at any time and reloaded later on

4activeEQ-AVAD 3

Performance

frame rate	up to 300fps
latency	down to 6.5ms (depending in configuration)
input power	9-36V DC
cooling	passive (no fan)
CAN Baudrate	up to 666,67

Dimensions

size	320x320x85mm
weight	7,5kg

Specification

☑ minimal latency times (according to NCAP specifications)
☑ 100 Hz frame rate (optional up to 300 fps)
☑ CAN-and LAN outputting rate 1 KHz maximum
☑ just a few milliseconds of information delay
☑ status signals activate the memory function

DTC GmbH
Navigation & Security Solutions

Optional enhancements

☑ CAN interface with two channels for vehicle data
☑ up to 8 patterns, colours and colour search areas
☑ up to 100 simultaneous tones
☑ single measuring camera optional up to 300 fps
☑ LAN communications interface
☑ single result combinations logically linkable to an overall result
☑ triggering from bit patterns for ECU messages with latency time calculation

4active**EQ**-Mesh

4activeEQ-Mesh - unlike any other wireless mesh system

☑ to extend network range, proving ground coverage and mobility
☑ one network node can make multiple connections simultaneously
☑ routes data continuously and instantaneously

Providing fully mobile broadband connectivity

☑ edge devices get connected via 2.4GHz and 5Ghz simultaneously
☑ quickly adapts to rapidly-deployed and quickly or constantly moving platforms
☑ routing decisions are based on the lowest latency

Precise - reliable - efficient in any application

☑ support for several strong cryptographic options
☑ high bandwidth for data, voice, and video applications
☑ scalability to hundreds of mobile, high-bandwidth nodes

4active**EQ**-Mesh

Performance

frequency	2.4 GHz and 5 GHz
antenna connector	(2) Type N (female)
modulation	DSSS [*], CCK [*], OFDM
max. physical layer data rate	300 Mbps (throughput varies)
max. RF transmit power [**]	29 dBm ± 2 dB
receive sensitivity	varying between -93 dBm ± 2 dB and -72 dBm ± 2 dB
input voltage	9 - 30 VDC Passive PoE
power cunsumption	2.8 W (average, idle); 15 W (maximum, peak) @ 24 V
protection class	IP67
operating temperature	-40°C to +60°C
ethernet	10/100/1000 Mbps IEEE 802.3, RJ-45, auto MDI/MDIX
USB	Micro-B USB port for firmware upgrades and GPS device add-on

[*] concerns only 2,4 GHz   [**] is governed by local regulations and varies by frequency

Dimensions

frequency	155 mm x 149 mm x 41 mm
weight	440 g ± 10 g

Key features

- ☑ no single point of failure
- ☑ ease of integratio
- ☑ low maintenance
- ☑ scalability
- ☑ 802.11 compatibility

4active**PS**

### 4activePS - static pedestrian target

- ☑ available as 50% adult male, 7-year, 2-year, 1-year old child
- ☑ replicates human properties in size, shape and articulation
- ☑ complies with ISO 19237, ISO 19206-2, Euro NCAP, JNCAP, ...

Allows testing under rough conditions

- ☑ extremely light and soft structure to prevent damage on VUT
- ☑ robust and modular system – easy and fast change of spare parts
- ☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

- ☑ 50% adult male
- ☑ 7-year, 2-year, 1-year old child
- ☑ heated pedestrian target – 4activeHT

V.2.0
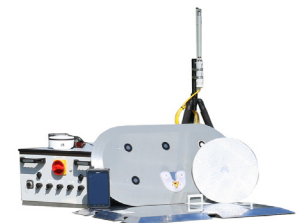
4active**PS**

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infraredstar★	✔
ultra-sonic	✔
crash speed	up to 60 km/h
operation speed	up to 10 km/h

<div align="right">★ optional</div>

Dimensions adult

body height	1800 mm
shoulder width	500 mm
torso angle	85 °
weight	< 4 kg★★ / 7,5 kg ★★★

<div align="right">★★ 4activePS ★★★ 4activePA</div>

Dimensions child

body height	1154 mm
shoulder width	298 mm
torso angle	78 °
weight	< 2 kg★★ / 4 kg★★★

<div align="right">★★ 4activePS ★★★4activePA</div>

Key features

- ☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
- ☑ absolute waterproof - testing under rainy conditions
- ☑ extremely light
- ☑ soft structure to prevent damage on VUT

4active**OD**-newborn

4activeOD-newborn

☑ for testing occupant detection systems
☑ simulates typical postures of a newborn child
☑ complies with EuroNCAP-test protocol CPD version 1.1

Test setups

☑ different CRS possible
☑ different seat positions
☑ remote control of functionalities

Physical properties

☑ human like movements e.g breathing
☑ adjustable breathing patterns
☑ realistic response to relevant sensor systems

4active**OD**-newborn

Performance

radar systems	☑
camera systems	☑
lidar systems	☑
ultrasonic systems	☑
wifi sensing systems	☑
euroNCAP movement patterns	☑
modular concept	☑
user defined movement patterns	☑

Dimensions

body height	520mm ± 10
shoulder width	170mm ± 10
head circumference	110mm ± 10
chest circumference	290mm ± 10

Key features

☑ quick setup
☑ adjustable movement patterns
☑ robust and modular system
☑ easy and flexible control
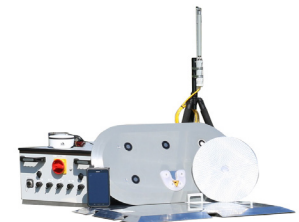
4active**PS**-1year child

4activePS-1year child

- ☑ for testing automated valet parking systems (AVPS)
- ☑ simulates typical postures of a 1 year old child
- ☑ complies with upcoming ISO 19206-9

Allows testing under rough conditions

- ☑ extreme lightweight and soft structure to prevent damage on VUT
- ☑ robust and modular system – easy and fast change of spare parts
- ☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available postures

- ☑ crawling
- ☑ sitting
- ☑ lying

V.1.0

4active**PS**-1year child

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
ultra-sonic	✔
crash speed	up to 60 km/h
operation speed	up to 10 km/h

★ optional

Dimensions

body height	658 mm
shoulder width	172 mm
head width	109 mm
torso angle	85 °
weight	< 2 kg

Key features

- ☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
- ☑ absolute waterproof - testing under rainy conditions
- ☑ extremely lightweight
- ☑ soft structure to prevent damage on VUT
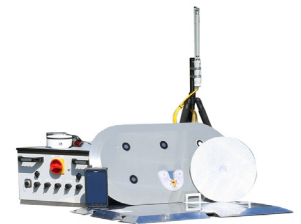
4active**PS**-2years child

4activePS-2years child

☑ for testing automated valet parking systems (AVPS)
☑ simulates typical postures of a 2 year old child
☑ complies with upcoming ISO 19206-9

Allows testing under rough conditions

☑ extreme lightweight and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available postures

☑ standing
☑ lying
☑ sitting

V.1.0

4active**PS**-2years child

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
ultra-sonic	✔
crash speed	up to 60 km/h
operation speed	up to 10 km/h

★ optional

Dimensions

body height (excl. shoes)	865 mm
shoulder width	232 mm
head width	132 mm
torso angle	85 °
weight	< 2 kg

Key features

- ☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
- ☑ absolute waterproof - testing under rainy conditions
- ☑ extreme lightweight
- ☑ soft structure to prevent damage on VUT

4active**HT**

4activeHT - heated cover dummy

☑ for testing passive IR-systems like night vision
☑ applicable as a static or moving object
☑ compatible with 4activeSB, 4activeXB, 4activeFB-small, 4activeFB-eco

Optimal heat transfer due to battery powered heated cover

☑ power supply (2x12V) via trailing cable
☑ heating mats ensure an optimal heat transfer to the outer surface
☑ control of 5 different heating zones: head, torso, legs, hands, arms

Available options

☑ 4activePS-HT - heated static pedestrian target
☑ 4activePA-HT - heated articulated pedestrian target
☑ 4activeAN-HT - heated animal target

4active**HT**

Dimensions 4activePS-HT

body height adult	1800 mm
weight adult	< 8 kg★
body height child	1154 mm
weight child	< 4 kg ★

Dimensions 4activePA-HT

body height adult	1800 mm
weight adult	< 10 kg★
body height child	1154 mm
weight child	< 5 kg★

Dimensions 4activeAN-HT

body height roe deer	170 mm
weight	< 6 kg★

Performance

collision speed crossing scenario	up to 30 km/h (18 mph)
collision speed longitudinal scenario	Δv 20 km/h (12 mph)

★ weight excl. accessories (batteries, cable)

Key features

☑ compatible with 4activeSB, 4activeXB, 4activeFB-small, 4activeFB-eco
☑ for testing passive IR-systems like night vision
☑ heating control unit to control five different zones
☑ power supply (2x12V) via trailing cable

4activePA

4activePA - The official Euro NCAP pedestrian target (EPTa, EPTc)

☑ available as 50% adult male and 7-year-old child
☑ replicates human properties in size, shape and articulation
☑ complies with ISO 19206-2, Euro NCAP, CNCAP, JNCAP, ...

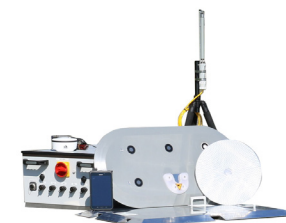**Allows testing under rough conditions**

☑ extremely light and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

☑ 50% adult male, 7-year-old child
☑ heated pedestrian target – 4activeHT
☑ additional synchronized articulation (arms, head, ...)

4active**PA**

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
ultra-sonic	✔
crash speed	up to 60 km/h
operation speed	up to 10 km/h

<div align="right">★ optional</div>

Dimensions adult

body height	1800 mm
shoulder width	500 mm
torso angle	85 °
weight	< 4 kg★★ / 7,5 kg ★★★

<div align="right">★★ 4activePS ★★★ 4activePA</div>

Dimensions child

body height	1154 mm
shoulder width	298 mm
torso angle	78 °
weight	< 2 kg★★ / 4 kg★★★

<div align="right">★★ 4activePS ★★★4activePA</div>

Key features

- ☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
- ☑ absolute waterproof - testing under rainy conditions
- ☑ extremely light
- ☑ soft structure to prevent damage on VUT

4active**BS**-adult

The official Euro NCAP bicyclist target (EBT)

☑ standard average european utility bike – average male
☑ realistic properties in size, shape and rotating wheels
☑ complies with ISO 19206-4, Euro NCAP, UN-ECE, ...

Allows testing under rough conditions

☑ extremely light and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

☑ heated bicyclist target – 4activeHT
☑ different frame colours
☑ synchronized articulation (pedalling, arm signs, ...)

4activeBS-adult

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
ultra-sonic	✔
crash speed lateral / longitudinal	up to 60 km/h / up to 45 km/h
operation speed	up to 35 km/h

★ optional

Dimensions bike

handlebar height	1200 mm
diameter wheels	700 mm
wheel base	1230 mm
weight	6 kg

Dimensions bicyclist

body height	1800 mm
shoulder width	500 mm
torso angle	10°
weight	< 4 kg

Key features

☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
☑ rotating wheels - permanent contact to ground
☑ foldable bike - easy transportation and storage
☑ extremely light and soft structure

4active**BS**-child

The ISO 19206-4 conform child bicyclist target

☑ standard average european utility bike – 6 to 7 year old child (ISO 19206-4)
☑ realistic properties in size, shape and rotating wheels
☑ complies with ISO 19206-4, UN-ECE R151

Allows testing under rough conditions

☑ extremely lightweight and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

☑ different frame colours
☑ heated bicyclist target – 4activeHT

V.1.0

4activeBS-child

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
ultra-sonic	✔
crash speed lateral / longitudinal	up to 60 km/h / up to 45 km/h
operation speed	up to 35 km/h

★ optional

Dimensions bike

handlebar height	715 mm
diameter wheels	412 mm
wheel base	733 mm
weight	< 5 kg

Dimensions bicyclist

body height	1200 mm
shoulder width	298 mm
torso angle	10°
weight	< 2 kg

Key features

☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
☑ rotating wheels - permanent contact to ground
☑ foldable bike - easy transportation and storage
☑ extremely lightweight and soft structure

4active**PS**-eKickboard-Scooter

## 4activePS-scooter - static pedestrian target

- ☑ available as 50% adult male
- ☑ replicates scooter-driver properties in size and shape
- ☑ designed according to related ISO-standards

Allows testing under rough conditions

- ☑ extremely light and soft structure to prevent damage on VUT
- ☑ robust and modular system – easy and fast change of spare parts
- ☑ absolutely waterproof - testing under rainy conditions
- ☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

- ☑ heated pedestrian target - 4activeHT★
- ☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
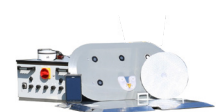
★delivery time on request

V.2.0

4active**PS**-eKickboard-Scooter

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
ultra-sonic	✔
crash speed	up to 60 km/h
operation speed	up to 10 km/h

★ optional

Dimensions adult

body height	1800 mm
shoulder width	500 mm
torso angle	85 °
weight	< 4 kg

Dimensions scooter

total height	1211 mm
total width	490 mm
footboard height	160 mm
wheel base	1114 mm
wheel diameter	250 mm

Key features

- ☑ compatible with 4activeSB, 4activeFB-small, 4activeFB-eco
- ☑ absolutely waterproof - testing under rainy conditions
- ☑ extremely light
- ☑ soft structure to prevent damage on VUT

4active**MC** (CNCAP E-Scooter)

The approved E-scooter target for C NCAP 2021 ADAS tests

☑ corresponding to category L3e-A1 as applied by UNECE
☑ realistic properties in size, shape and microdoppler features
☑ complies with ISO/PWI 19206-5, CNCAP 2021

Allows testing under rough conditions

☑ extremely light and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Additional optional features

☑ synchronized movement features
☑ side leaning features
☑ active lighting

V.1.0
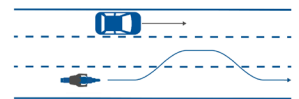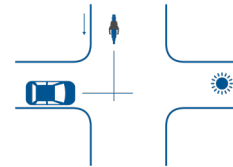
4active**MC** (CNCAP E-Scooter)

Performance

mono/ stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
crash speed lateral / longitudinal	up to 60 km/h / up to 40 km/h
operation speed	60 km/h

★ optional

Dimensions motorbike

seat height	760 mm
wheel base	1210 mm
total width	540 mm
wheel diameter	400 mm
weight	< 13,5kg

Dimensions biker

height (body)	1650 mm ± 20
width (shoulder)	450 mm ± 20
depth (torso)	200 mm ± 20
weight	< 4 kg

Key features

- ☑ compatible with 4activeFB-small
- ☑ extremely light and soft structure
- ☑ robust and modular system
- ☑ synchronized movement features

4active**MC**

The approved PTW target for planned Euro NCAP 2023

☑ corresponding to category L3 as applied by UNECE
☑ realistic properties in size, shape and rotational features
☑ complies with ISO 19206-5 WD, Euro NCAP, …

Allows testing under rough conditions

☑ extremely light and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

☑ different models (scooter, …)
☑ different optical appearance and colours
☑ synchronized movement features

V.3.0

4active**MC**

Performance

mono/ stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	✔
near infrared / far infrared★	✔
crash speed lateral / longitudinal	up to 60 km/h / up to 50 + 20 km/h
operation speed	80 km/h

★ optional

Dimensions motorbike

seat height	820 mm
wheel base	1420 mm
total width	750 mm
wheel diameter	17"
weight	< 11 kg

Dimensions biker

height (body)	1800 mm ± 20
width (shoulder)	500 mm ± 20
depth (torso)	235 mm ± 20
weight	< 4 kg

Key features

- ☑ compatible with 4activeFB-small, 4activeXB
- ☑ extremely light and soft structure
- ☑ robust and modular system
- ☑ synchronized movement features
- ☑ simulat rotating wheels

4active**C2**

Conform to the Euro NCAP target 2020 specification

☑ easy and fast reassembly within 2 minutes by 2 people
☑ compatible with 4activeFB-large and other robotic platforms
☑ complies with ISO 19206-3 WD, Euro NCAP, ...

Allows testing under rough conditions

☑ extremely light and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

☑ different car categories, different optical appearance and colours
☑ active lighting features (brake, blinking, ...)
☑ synchronized movement features

4active**C2**

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
near infrared	✔
ultra-sonic	✔
crash speed lateral / longitudinal	up to 60 km/h / up to 72 km/h★
operation speed	up to 100 km/h

★ at ELK oncoming with 10% overlap

Dimensions

overall length	4060 mm
overall height	1430 mm
overall width	1800 mm
tire diameter	600 mm
wheelbase	2560 mm
weight	< 80 kg

Euro NCAP scenarios

AEB-CCRs / -CCRm / -CCRb	✔
CCFtap, ELK, LSS	✔

Key features

- ☑ easy and fast reassembly in 2 min by 2 people
- ☑ extremely light and soft structure
- ☑ robust and modular system
- ☑ different options available

4active**AN**

The most realistic animal targets worldwide

☑ available as Roe Deer, White Tail Deer, Moose, Wild Boar,...
☑ compatible with 4activeFB-small, 4activeSB★, 4activeXB
☑ as an outcome of long-term research projects

★ depending on dummy type

Allows testing under rough conditions

☑ extremely light and soft structure to prevent damage on VUT
☑ robust and modular system – easy and fast change of spare parts
☑ realistic response for Radar-, Lidar, Camera and IR-Systems

Available options

☑ heated animal target – 4activeHT (AN)
☑ additional synchronized articulation (legs)
☑ radar-invisible stand for static tests

V.2.0

4active**AN**

Performance

mono/stereo camera system, Lidar sensors	✔
360° - Radar characteristic	✔
micro-Doppler spread	optional
near infrared (far infrared★)	✔ (★optional)
ultra-sonic	✔
crash speed	up to 50 km/h★★
operation speed	up to 60 km/h★★

★★ depending on animal type

Dimensions

Roe Deer	960x1085x170 mm
White Tail Deer	1490x1210x270 mm
Wild Boar	1580x1020x560 mm
Moose	2490x1930x690 mm

Weight

Roe Deer	4,5 kg
White Tail Deer	7,5 kg
Wild Boar	14 kg
Moose	35 kg

Key features

☑ extremely light and soft structure
☑ robust and modular system
☑ many different animal types available
☑ realistic response for Radar-, Lidar, Camera, IR-Systems

4active**EQ**-Light System

Easily transportable Light System for night tests in urban situations

☑ light system acc. to Euro NCAP / CNCAP TEST PROTOCOL – AEB VRU systems
☑ in compliance with the European standard DIN EN 13201, ISO 19237
☑ reflecting real world conditions

Allows testing under rough conditions

☑ absolutely waterproof for testing under rainy conditions
☑ ballast elements to guarantee a wind stability up to 20 m/s
☑ compact size for easy transport and storage

Available options:

☑ Light system for night tests acc. to Euro NCAP 2020 (5 pcs)
☑ Light system for night tests acc. to CNCAP (6 pcs)
☑ Light system for night tests acc. to Euro NCAP 2023 (7 pcs)

4active**EQ**-Light System

Performance

LED Light	220-240V. 50-60Hz. 4.000K white

Dimensions

height elevator tripod	5000 mm
width elevator tripod	1200 mm
packing size per set	2150x950x1150 mm
packing weight per set	380★ / 430★★ / 520★★★ kg

★ applies to Euro NCAP 2020 ★★ applies to CNCAP ★★★ applies to Euro NCAP 2023

Equipment

- ☑ 5x★ (6x★★/ 7x★★★) elevator tripod for raising the lamp
- ☑ 5x★ (6x★★ / 7x★★★) LED light
- ☑ 1x luxmeter for verifying the specified illumination
- ☑ 4x★ (5x★★/ 6x★★★) cable 25m including drum
- ☑ 1x cable 25m
- ☑ 1x measuring tape
- ☑ 1x water level
- ☑ 1x aluminium plate
- ☑ aluminium transport boxes

★ applies to Euro NCAP 2020 ★★ applies to CNCAP ★★★ applies to Euro NCAP 2023

Key features

- ☑ absolutely waterproof
- ☑ wind stability up to 20 m/s
- ☑ reflects real world conditions
- ☑ compact size for easy transport and storage

4active**EQ**-Obstruction Wall

Easy transportable obstruction wall for ADAS and AD testing

☑ represents properties of a brick wall
☑ realistic response for Radar-, Lidar, Camera and IR-Systems
☑ designed according to NCAP-requirements for AEB VRU Systems

Allows testing under rough conditions

☑ extremely light and easy to build up
☑ absolutely waterproof for testing under rainy conditions
☑ ballast elements to guarantee a wind stability up to 20 m/s

For testing on proving grounds and test tracks

☑ multi layer structured fibre reinforced construction
☑ built of modular segments - easily expandable
☑ easy transport and storage

4active**EQ**-Obstruction Wall

Dimensions

height	2000 mm
length per part	1220 mm
total length (7 parts)	8500 mm
weight	31 kg
colour	light grey

Radar Properties

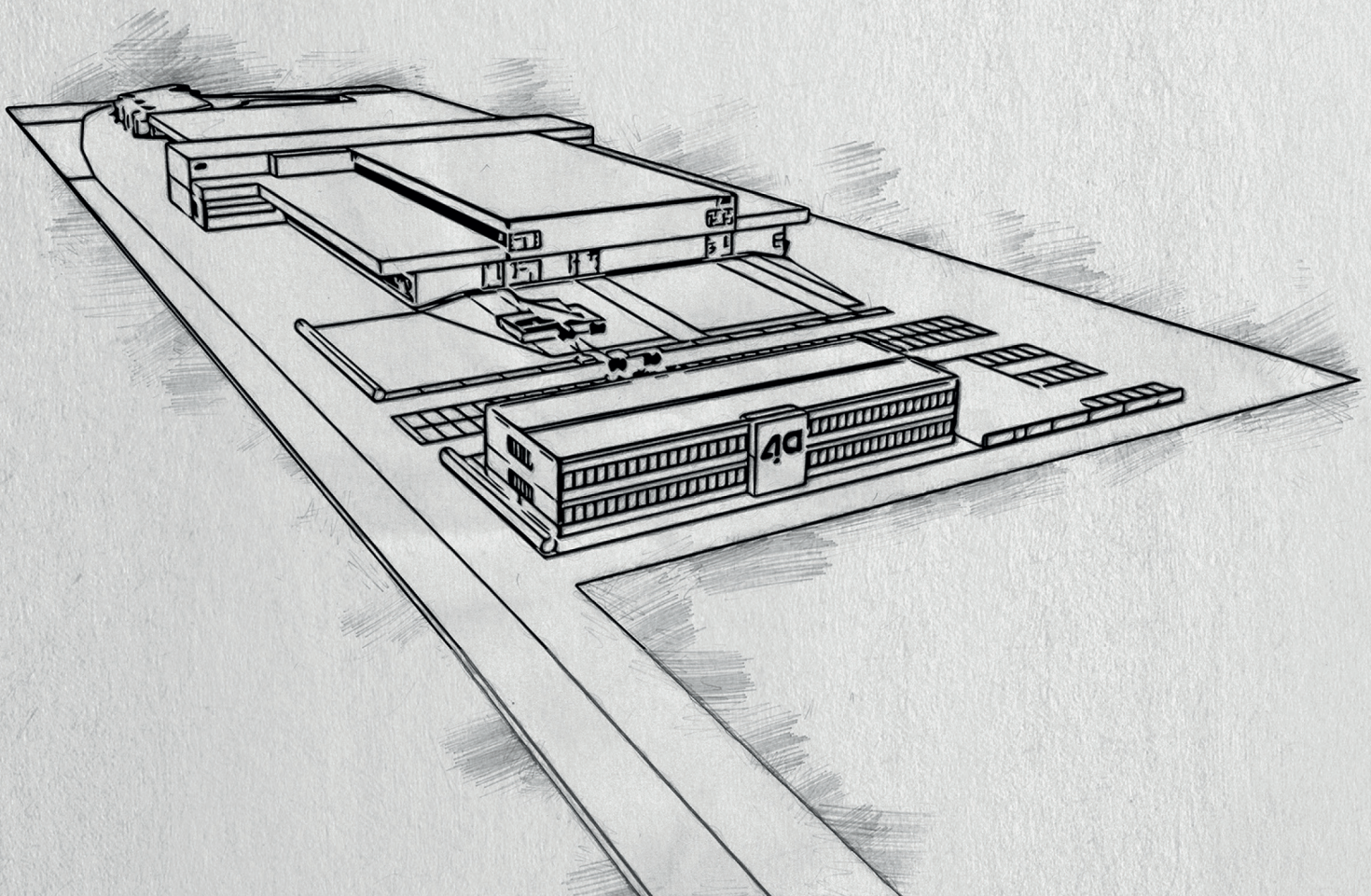|	
IR Reflectivity	850 to 910 nm -> 50%
Radar Reflectivity★	10-30 dBsm (viewing angle 0 deg) 20-0 dBsm (viewing angle 45 deg)

★for a frequency of 77 GHz

Key features

- ☑ extremely light and easy to build up
- ☑ absolutely waterproof
- ☑ wind stability up to 20 m/s
- ☑ easy transport and storage