

# iTURTLE

## Computer Remote Controlled Target Carrier for ADAS Testing - Technology Demonstrator -

Advanced Driver Assistance Systems (ADAS) are designed to prevent accidents caused by unskilled drivers, external events (collision with pedestrians, bicycles, motorcycle or other hard and soft targets) or due to difficult environment. To test the interaction between an ADAS and such targets, iTURTLE will be used.

- position accuracy of 2 cm (under static and dynamic motion condition; GNSS RTK)
- fully remote controlled via WLAN; interfaces to payload: CAN / Ethernet / PSS / RS232 / RS422 (e.g. to command certain target actions like lifting pedestrian's arms)
- the setup supports one, two or more moving vehicles and RTK-GNSS reference station.
- iMAR's well-known iTraceRT INS/ GNSS technology used for navigation
- iTURTLE can be over-run by other vehicles without damages in case of any planned or accidently impact

iTURTLE is a computer controlled platform, which can move with up to 80 km/h on the road and which can carry any dummy device (target)

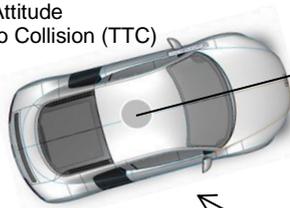
like a pedestrian, bicycle or car mock up. The most flat design of iTURTLE, its high positioning accuracy based on iMAR's proven iTraceRT technology, its light weight and easy handling makes iTURTLE to be an universal add-on device on the ADAS test environment.

Due to its exceptional time synchronisation hardware, iMAR has selected its inertial measurement systems of the family iTraceRT to be used for MVT (Multi Vehicle Testing) and iTURTLE based ADAS applications. For this the iTraceRT contains a powerful L1/L2 RTK-GNSS receiver with deeply coupled INS/ GNSS realtime processing, a wheel sensor interface, a wireless data transmission and as an option a postproc software.

The following sketch shows the configuration in which the iTURTLE is used for ADAS testing:

### EGO Vehicle

- EGO position
- iTURTLE position
- Distance
- Heading (absolute)
- Bearing (relative)
- EGO Attitude
- Time to Collision (TTC)



Bearing & Distance

WLAN

### All Data with RTK accuracy \*

\*) Absolute with external Correction Data, relative without.

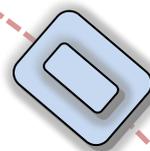
GNSS correction data



iREF-L1L2

### iTURTLE

- iTURTLE position
- EGO position
- Distance
- Heading (absolute)
- Bearing (relative)



The small size and light weight of iTURTLE is achieved by using the highly miniaturize

iTraceRT with integrated gyros, accelerometers, GNSS receiver and WLAN.





Photographs:  
iREF-L1L2, Honda Pedestrian Crash Test Dummy, iTURTLE on road, iTraceRT-M200

### Technical Data of iTURTLE for ADAS and MVT Applications:

Payload Capability:	up to 25 kg (can be customized up to 100 kg)
Speed:	up to 80 km/h (can be customized)
Maneuvering:	fully steerable
Protection:	IP54 for outdoor operation
Size:	1'000 x 900 x 120 mm (L x W x H) or customized
Weight:	approx. 25...60 kg, depending on size and payload capability
Temperature:	-40...+55 °C
Shock, protection:	60 g, 11 ms, IP68
Installation aids:	plug & play; integrated GNSS and WLAN antennas and re-chargable battery
Software packages:	integrated in iTraceRT-Command
Output:	WLAN based data transmission; USB, CAN, RS232; Data for EuroNCAP AEB testing (Autonomous Emergency Braking)
Inputs:	RTK correction data (via WLAN); event trigger
Wireless transmission:	included for communication to the test vehicle and for configuration
Inertial Meas. System:	see data sheet of iTraceRT-M200 (MEMS based)
RTK-GPS accuracy:	2 cm + 2 ppm of distance between iTURTLE and base station (no outages)
Data rate:	200 Hz (adjustable) for position updates
RTK-GNSS system:	included (L1/L2 receiver); GPS + GLONASS
Sync. Reference:	UTC time, provided as time stamp
Power:	internal re-chargable and exchangeable battery

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