



**iMAR is a worldwide leading developer and producer of inertial measuring systems for Navigation, Control, Surveying and Stabilisation.**

**FOR A WORLD  
IN MOTION**

**DEFINE STANDARDS ANEW**

**iMAR's strengths and expertises comprise the fast and reliable realisation of Out-of-the-box concepts, the development of complete, customer-specific system solutions for autonomous systems as well as test environments for the verification or homologation of these systems.**

**iMAR defines standards for system solutions concerning Navigation, Control, Surveying, Stabilisation and Automation and provides it's respective services worldwide.**

# iMAR Solutions for



## UNMANNED LAND PLATFORMS



### AUTONOMOUS PARKING & SHUNTING

iMAR develops intelligent solutions for outdoor or indoor applications: for example, for the fully automatic driving off the production line and the autonomous allocating of a free parking space.

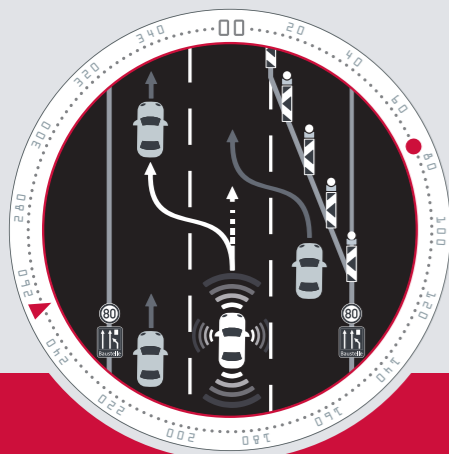
### VERIFICATION OF SENSORS & ACTUATORS

Timely and reliable accelerating and braking are essential and vital. iMAR develops solutions using its technology of fully autonomous guidance and control of vehicles, which guarantee a verification of safety critical components in and for dynamic test environments.



### TURN-KEY TEST AND PROVING GROUND AUTOMATION

From vehicle equipment for positioning, control and communication up to the complete proving ground infrastructure: iMAR signifies pathbreaking developments of system components up to complete solutions, e.g. acc. to ISO 22133.



• TREND SETTING • COMPLETE SOLUTIONS • EASY OPERATION

# iMAR Solutions for



## UNMANNED LAND PLATFORMS

### COMMAND AND GUIDANCE OF UNITS (MIL)

For the sake of your mission: Rely on the high end solutions of iMAR for the determination and visualisation of your own position, for target determination and allocation.

- Command and control of units (platoon, company, battalion, ..)
- Battle Field Management
- Swarm Control



### UNMANNED PLATFORMS — INDOOR & OUTDOOR

Extremely efficient, cost saving, constantly ready for use. UGVs (unmanned ground vehicles) conquer the mining industry, road construction industry and the exploitation: supported by inertial, GNSS, visual and many other technologies of iMAR.

### QUALITY ASSURANCE & CONTROL

- Material structure surveillance and control
- Load tests, e.g. for personnel protection in leisure parks
- Surveillance of buildings and structures
- Indoor – Positioning & Guidance of personnel etc.

Smart solutions from iMAR provide highest reliability.



# iMAR Solutions for



## UNMANNED AIR PLATFORMS

### UNMANNED AERIAL VEHICLES (MIL)

- Navigation – Surveillance – Reconnaissance
- Airborne Gravimetry
- A /C Guidance
- Target Displays / Drones

Precision, compactness as well as EMI /EMC and environmental hardening distinguish iMAR's solutions from others.



### COMMAND AND CONTROL OF AIRBORNE FORCES / SQUADRONS

- Acrobatic flights
- mixed swarms (manned / unmanned)
- Airborne refuelling

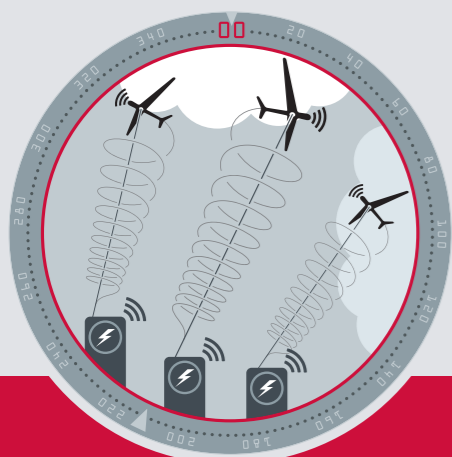
Civil or military, cost and safety aspects require the operation of fully automated or mixed manned and unmanned vehicles in swarms – with iMAR's iNAT navigation system - family, in combination with the iDMN Dynamic Mesh Communication Network, iMAR provides the answer and solution for this requirement.



### SPECIAL APPLICATIONS

- Automated free house deliveries of goods
- Automated vehicle guidance, e.g. for energy harvesting with Kites

The future has started, secure it and be part of it. iMAR provides the required system components and the total solutions – also available as an air – land – sea network.



# iMAR Solutions for



## UNMANNED SEA PLATFORMS

### AUTONOMOUS UUV

Localisation and control of autonomous underwater vehicles (AUV) and remote operated vehicles (ROV)

- Guidance of underwater vehicles, among others for exploration, wreck searching etc.
- Reconnaissance, mine hunting etc.
- Torpedo navigation



### AUTONOMOUS SURFACE VESSELS

- Command and control of a convoy
- Dynamic Positioning / Berthing
- Simplifying the ship landing
- Improvement of comfort and safety on vessels

iMAR's systems allow all this, due to the optimised hardware and software (INS/GNSS / sensor fusion), control of rudder & flaps, a secure communication network (Mesh) etc.



### AUTONOMY AT SEA, ON BORD & IN THE HARBOUR

- Automation of harbour tugs
- automated loading and de-loading of vessels
- Logistics and fleet management of straddle carriers in container harbours

Positioning & guidance by means of sensor fusion, provided by iMAR as complete solutions or in cooperation.



• TREND SETTING • COMPLETE SOLUTIONS • EASY OPERATION

# DETERMINING THE PACE

## FROM THE IDEA TO MASS PRODUCTION – AND BEYOND



iMAR not only develops and produces stand-alone units for Positioning and Control of vehicles but additionally offers turn-key solutions of complete systems. One example is iSWACO-ARGUS. iSWACO-ARGUS is the solution for the verification of the safety relevant features of highly and fully automated driving vehicles. It covers all SAE levels, i.e. from level 0 “hands on” up to level 4 “hands off, mind off - sometimes” and level 5 “hands off, no driver”. iSWACO-ARGUS stands for “Swarm Control & Continuous Surveillance” and controls and monitors the motion behaviour of the Vehicle under Test (VUT) as well as all other traffic simulating vehicles (TSV) on the proving ground and gives the unmatched flexibility to generate and execute also precise repeatable tests within real emulated traffic scenarios or even on public roads.

iSWACO-ARGUS contains the navigation and control (iNAT), the iARGUS-VCS vehicle control system for direct control of the vehicle’s actuators to follow the desired trajectory, the iARGUS-MV deep-learning assisted machine vision based module for advanced collision avoidance, the mesh based communication system with unmatched low latency (iDMN) for real-time control, and the visualisation and the management of the data obtained during the performed test scenarios (iARGUS-CMD). The iSWACO-ARGUS infrastructure can be installed quickly, simply and safely on arbitrary proving grounds and test vehicles. Thus, it is the testing and automation solution for both, OEMs and testing / homologation organizations. This scenario, which also covers the guidance and control of swarms, can be applied to many examples and cases of operation, civil and military, on land, at sea and airborne.

Besides the proving grounds, iMAR also offers the layout and equipment of modern container terminals in harbours, comprising the autonomous navigation, guidance and control of container vehicles etc.

Last but not least, also the landing of an UAV on an unmanned vessel is no more an illusion but reality. Thus, partial and full autonomy are no longer just objectives but iMAR proven reality.

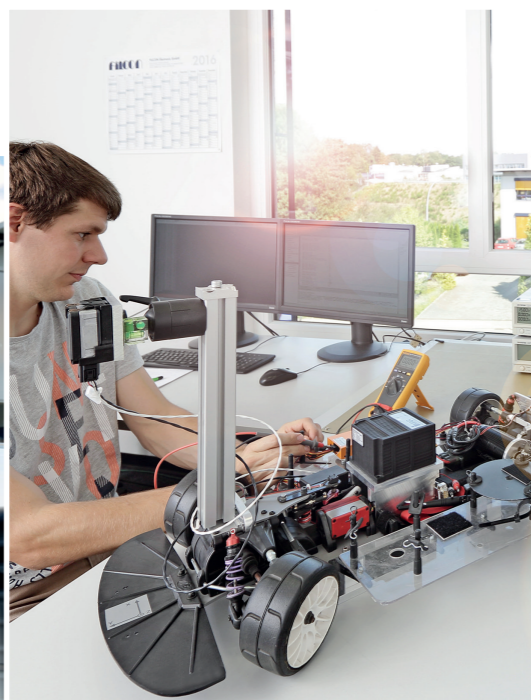
Everything from research and development,  
through manufacturing and integration,

down to testing and qualification in house.  
Supporting advanced ADAS & HAF testing.

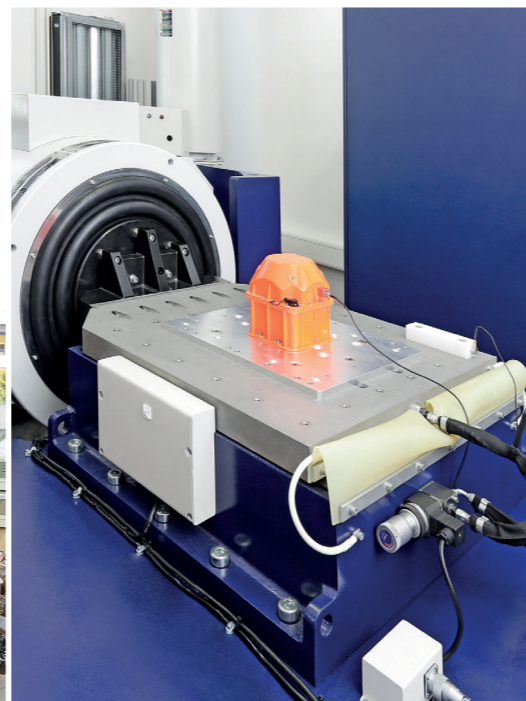
Full autonomy, legally as well as technically and from the logistics point of view means high flexibility and is the basis for a leading technological position of iMAR. We have a great knowledge and expertise in research, development and environmental qualification as well as in the required operating resources grounded for production, integration and testing of our products.



**RESEARCH**



**DEVELOPMENT**



**QUALIFICATION**



**MANUFACTURING**



**INTEGRATION**

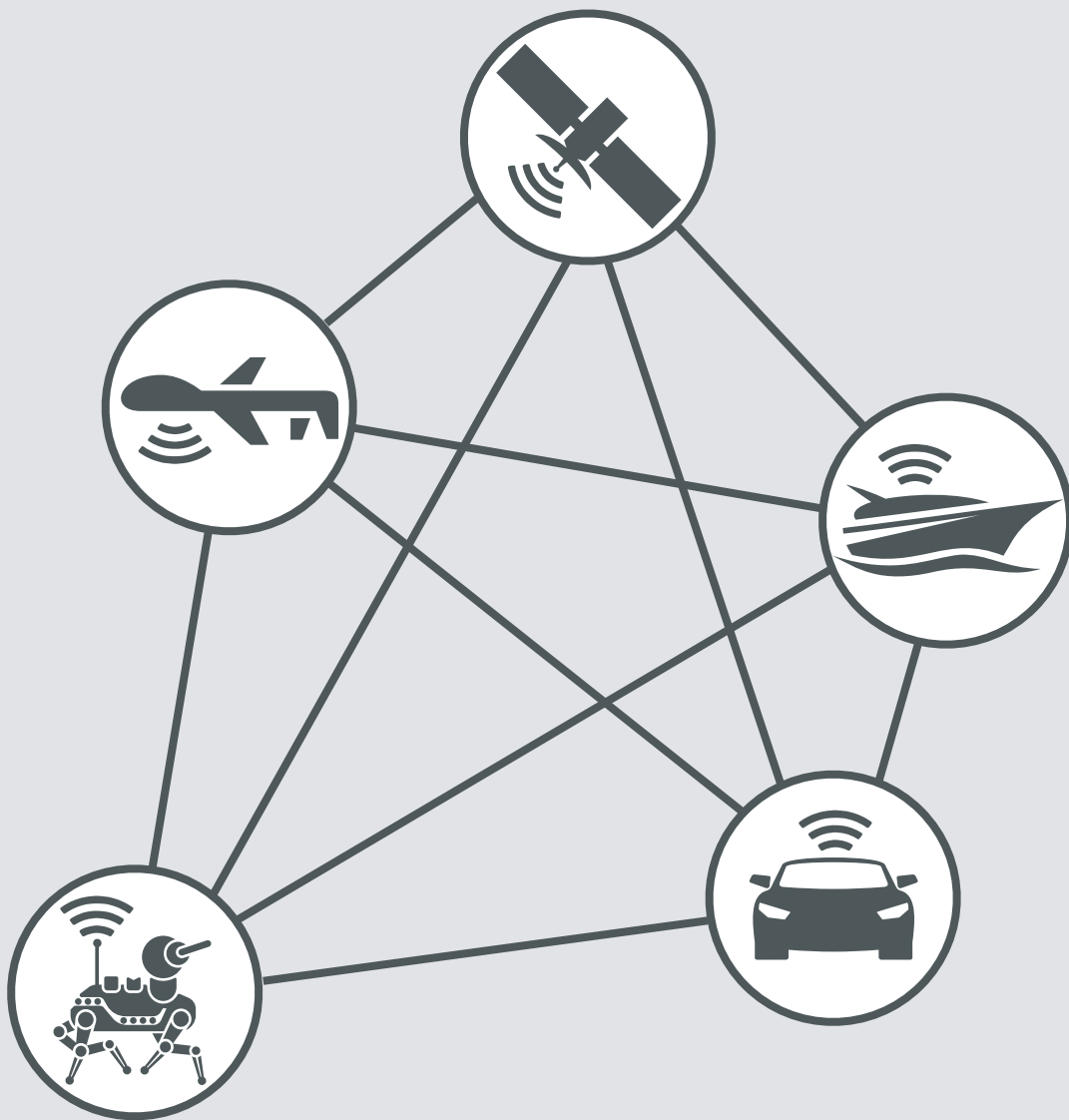


**TESTING**

Quality and flexibility as well as the satisfaction of our customers are iMAR's distinct features which we demonstrate and prove in the diversified fields of application day-after-day.

# DEVELOPING SOLUTIONS FOR THE TASKS OF TODAY AND TOMORROW

**WHATEVER IS YOUR CHALLENGE –  
YOU NAME IT AND WE'LL MASTER IT**



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