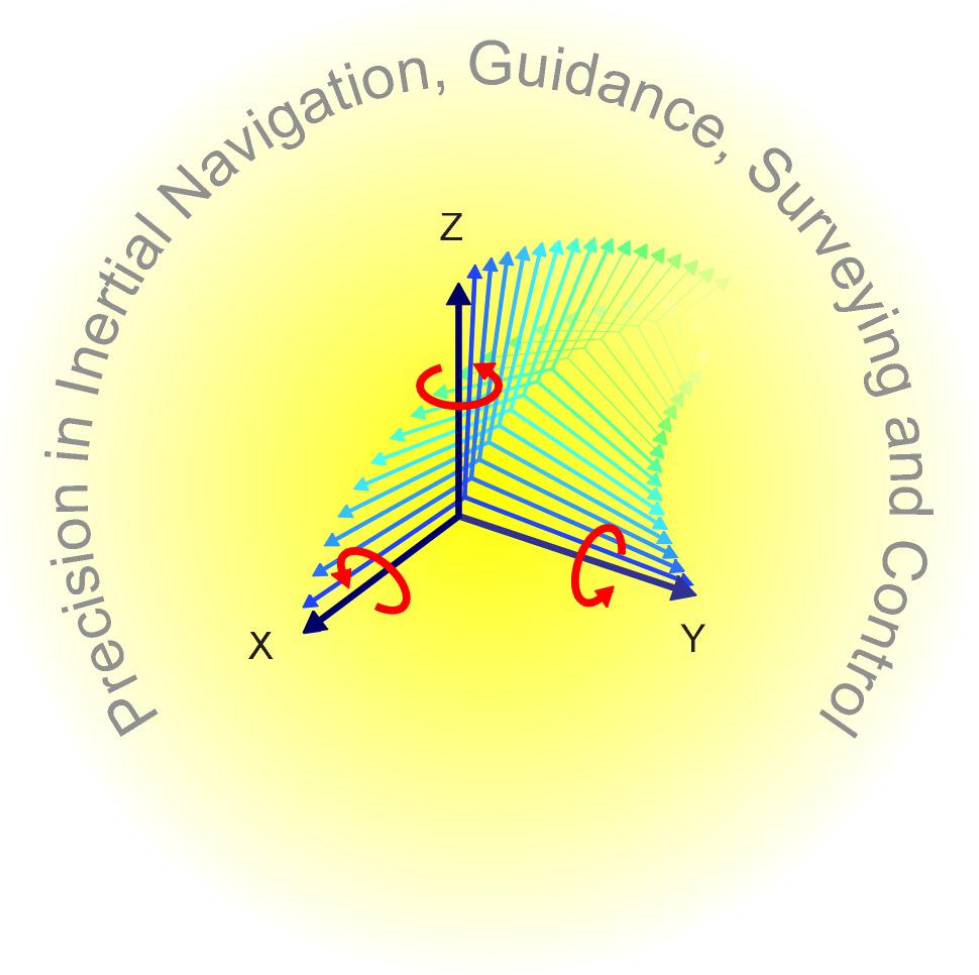


Bereich Marinesysteme • Marine & Naval Systems Division

Gesellschaft für inertiale Meß-,
Automatisierungs- und Regelsysteme

Systems for Inertial Measuring, Automation and Control

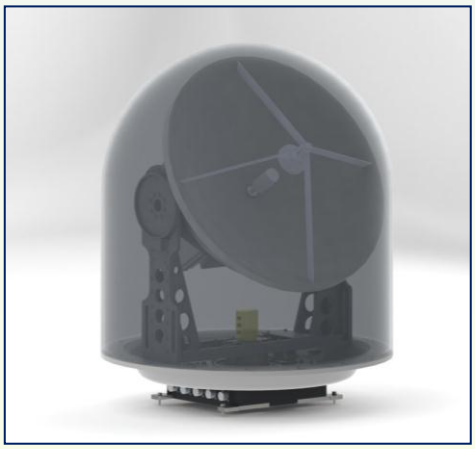
St.Ingbert • Germany

www.imar-navigation.de

Inertial Measuring Systems are used to determine the dynamic properties and trajectory of a moving object, as well as to the purpose of navigation, guidance and control or stabilization of objects like vehicles moving on land, at sea, in the air and even in space. Translational movements like sway, surge and heave, rotation and velocities are detected by means of accelerometers and gyroscopes („gyros“).

iNAV and iVRU analyse inertial quantities like acceleration and rotation rate, as well as any auxiliary data - the so-called support information like „seagoing“-related quantities / DVL, magnetic heading, GPS position and GPS velocity. On this basis they determine in real time all quantities, which are essential to guide or control a vessel moving in the water: roll, pitch, heading, heave, 3-D velocity, 3-D motion trajectory, information data necessary for stabilizing weapons, etc.

iSSMC analyses the motion state of the ship and the nominal attitude set either manually by the pilot or automatically by the ship's computer. All these data are used to generate the controlling variables needed to steer the main screw, rudders, stabilizing fins, bow thrusters and (optional) other actuators as well. iSSMC also guarantees signal integrity in redundant systems for safety-crucial applications and if required it can make signals available for different applications like aerials' stabilization.

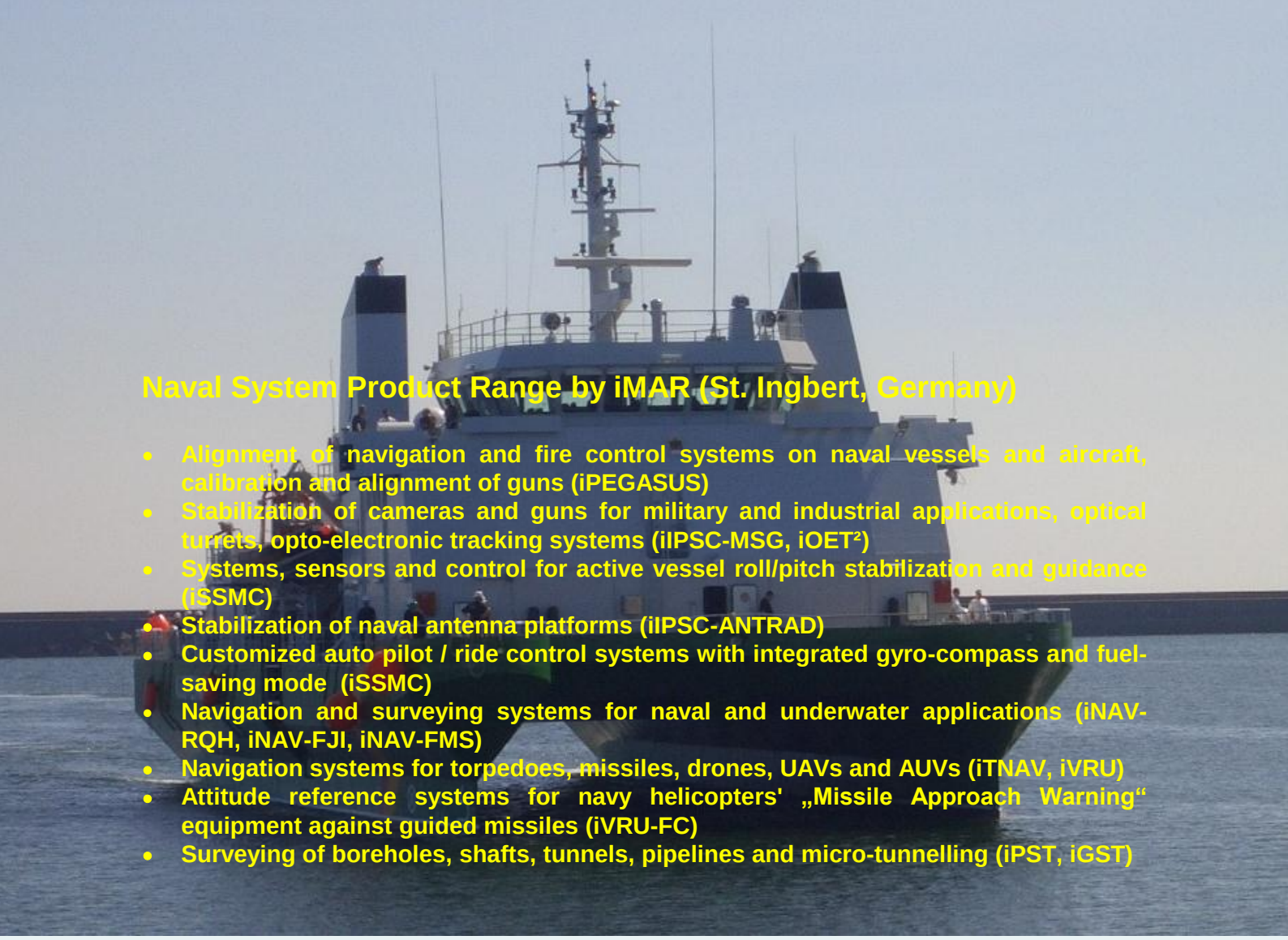


As a system supplier, iMAR offers a wide range of turnkey solutions both as stand-alone products and global systems, for instance to:

- support the shipbuilding industry in engineering not only stabilizing fins and rudders (foils, trim tabs, T-foils, interceptors, etc.) with the best possible hydrodynamical and energy-performance features, but also engine units;
- conceive, produce, deliver and install all necessary measuring and control systems (iNAV, iVRU, iSSMC), including bridge assembly (panel) and interfaces with the actuator system (rudders, stabilizing fins, aerials, weapons, optronic systems etc.);
- design of interfaces between existing actuators and control and guidance systems. Support in preparing and applying for the relevant licences and design inspections by the competent bodies like German Lloyd or military authorities.

customized version

Besides monitoring and control systems for surface vessels (like the two German Customs' SWATH offshore patrol vessels Helgoland and Borkum), iMAR designs and manufactures optronic stabilized EOTS systems **iIPSC** (e.g. for the German Navy), stabilization systems (e.g. for the US Navy Cobra Judy missile defence system), torpedo navigation systems (like DM2A4 SeaHake for several European navies) as well as navigation and control systems for underwater vessels (e.g. for FUGRO) or open architecture based marine ship stabilized pedestals for communication and radar antennas (**iIPSC-ANTRAD**) or stabilized weapon stations.



Naval System Product Range by iMAR (St. Ingbert, Germany)

- Alignment of navigation and fire control systems on naval vessels and aircraft, calibration and alignment of guns (iPEGASUS)
- Stabilization of cameras and guns for military and industrial applications, optical turrets, opto-electronic tracking systems (iIPSC-MSG, iOET²)
- Systems, sensors and control for active vessel roll/pitch stabilization and guidance (iSSMC)
- Stabilization of naval antenna platforms (iIPSC-ANTRAD)
- Customized auto pilot / ride control systems with integrated gyro-compass and fuel-saving mode (iSSMC)
- Navigation and surveying systems for naval and underwater applications (iNAV-RQH, iNAV-FJI, iNAV-FMS)
- Navigation systems for torpedoes, missiles, drones, UAVs and AUVs (iTNAV, iVRU)
- Attitude reference systems for navy helicopters' „Missile Approach Warning“ equipment against guided missiles (iVRU-FC)
- Surveying of boreholes, shafts, tunnels, pipelines and micro-tunnelling (iPST, iGST)

Referenzliste • References (Auszug) • (Excerpt)

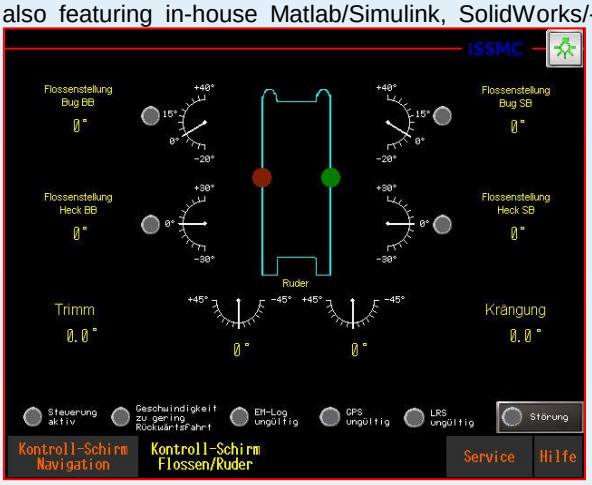
Atlas Elektronik
AUDI AG
Autoflug
Autoliv
BAE UK
BAE Systems USA
Bauer Spezialtiefbau
Belgium Army
BGT / Diehl
Blohm & Voss
BMW
Bosch
Bundesamt für Wehrtechnik (BWB)
CONTI - TEVES
DaimlerChrysler
Deutsche Bahn AG
Dongfeng Motors
Dornier
Dynamit Nobel
EADS
ELAC Nautik
Elbit Systems
E.ON
Eurocopter
FGAN
FKFS
Ford AG
Fugro NL/US
GeneralDynamics
German Navy
GIF
Gruppe Rüstung (GRD)
HDW AG
Honda
HSVA Hamburg
HydroControl
IGGF
IFI
Kongsberg
Krauss-Maffei-Wegmann
Leica
LMS
Mauser Werke
Mercedes-Benz AG
NATO / SACLANT
NavTeq
NovAtel
Oerlikon Contraves
OPEL AG
PII Pipetronix
Prüftechnik AG
RAFAEL
Rheinmetall
Rosen Engineering
RWTH Aachen
SACR AG
SF Schweizer Flugzeugwerke
SIEMENS AG
SMART
Spain Navy
OMNICOM
SAAB Dynamics
SVA Potsdam
Steyr-Daimler-Puch AG
Thyssen Krupp Marine Systems
Toyota
TU Braunschweig
Turkish Navy
UK Navy
US Navy
Uni München
Volkswagen AG
Wacker AG
WTD41/52/61/71/81
Westland-Agusta Helicopters


iMAR GmbH was founded in 1992 in St. Ingbert, near Frankfurt (Germany), where it still has its headquarters and production site (1.500 sq. m/16,000 sq. ft). Our company has extensive long-time experience in conception, development, production, maintenance, sales and support of inertial measuring and navigation systems destined to a wide range of standard and special applications in various fields like surveying, stabilisation, guidance, control and defence.

Three key elements make a sound basis for developing

our advanced inertial measuring systems - know-how, expertise and in-depth knowledge of inertial measuring technologies, navigation algorithms, sensor systems, propulsion technologies, hydraulics, mechatronics and process calculation systems, as well as hardware design & software engineering.

Our cost-effective, premium high-tech products and system solutions are the result of a policy of continuous investment in human resources and technological innovation; 40 employees (2010), all highly qualified and dedicated to their work, state-of-the-art sensor technologies ranging from MEMS gyros to ring laser gyros and a powerful development and production tool chain also featuring in-house Matlab/Simulink, SolidWorks/-



COSMOS, AltiumDesigner, FPGA design, HyperMill, 3-axis and 5-axis CNC centres etc..

Quality and reliability of our products are guaranteed by our modern production site, which is certified according to ISO 9001 / EN 9100 quality standards (industrial engineering / development and production lifecycle according to aviation requirements) and EASA Part21G for aviation manufacturing. Our comprehensive testing equipment also includes several two and three axes turntables, full range temperature chambers and a 40 kN shock and vibration testing platform fully complying with mil/space specifications. After final testing our products are delivered to customers operating in industrial branches, automotive industry, to civil aviation companies and to the armed forces (navy, army and airforces) and aerospace agencies of many countries.

iMAR

Gesellschaft für inertiale Meß-,
Automatisierungs- und Regelsysteme

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