

WHO DEVELOPS INNOVATIVE
HIGH-FREQUENCY RADIO MODULES
AND COMMUNICATIONS SYSTEMS?

> WE DO

Research

Development

Products

Testing



> WWW.IMST.DE



> WWW.IMST.DE

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IMST

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IMST

CENTRE OF EXCELLENCE AND
DEVELOPER OF PROFESSIONAL
RADIO TECHNOLOGY

> IMST GMBH



FROM DRAWING BOARD TO PRODUCTION

IMST GmbH is a center of excellence and developer of professional radio technology. We are proud to look back on more than 17 years of success. There have been many changes since 1992, but the values that created IMST – innovation, integrity and smart partnerships – have remained. We have held on to this tradition and it has served us well.

As an engineering company and service provider, IMST is one of the world's leading developers of high-frequency circuits, radio modules and communication systems. We have partnerships in standard business sectors as well as public research. Our strength is our customer-orientated support through every stage of product development – from initial advising to the start of production, we offer a one stop solution!

How does IMST differ from typical engineering companies? Instead of limiting ourselves to our core abilities, we embrace variety, flexibility and learning through research. The equivalent of the IMST model in physics would be a "coupled resonator" – demand and stimulus determine the resonant areas where we "buzz." This makes IMST crisis-resistant even in difficult times and always responsive and reliable. Our customers and partners enjoy sustainable benefits as a result. And, thanks to our links with European research institutes involved in the EU's general programme, we give our customers the competitive edge that comes from direct access to the world's most up-to-date research and development.

Learn how you can benefit from our products, technologies and services. This brochure provides an overview of IMST. Please contact us for additional information



Ingo Wolff



Peter Waldow



IMST customer?

More than 100 of our engineers work for companies worldwide, and most are listed in the TecDax.

> WWW.ANTENNEN.IMST.DE

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Antennas

MARKET LEADER THROUGH
FUNDAMENTAL RESEARCH

> ANTENNAS



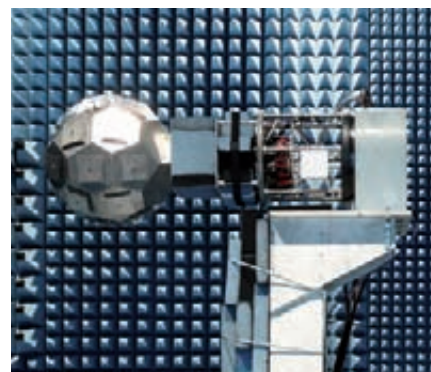
ANTENNAS FOR EVERY APPLICATION

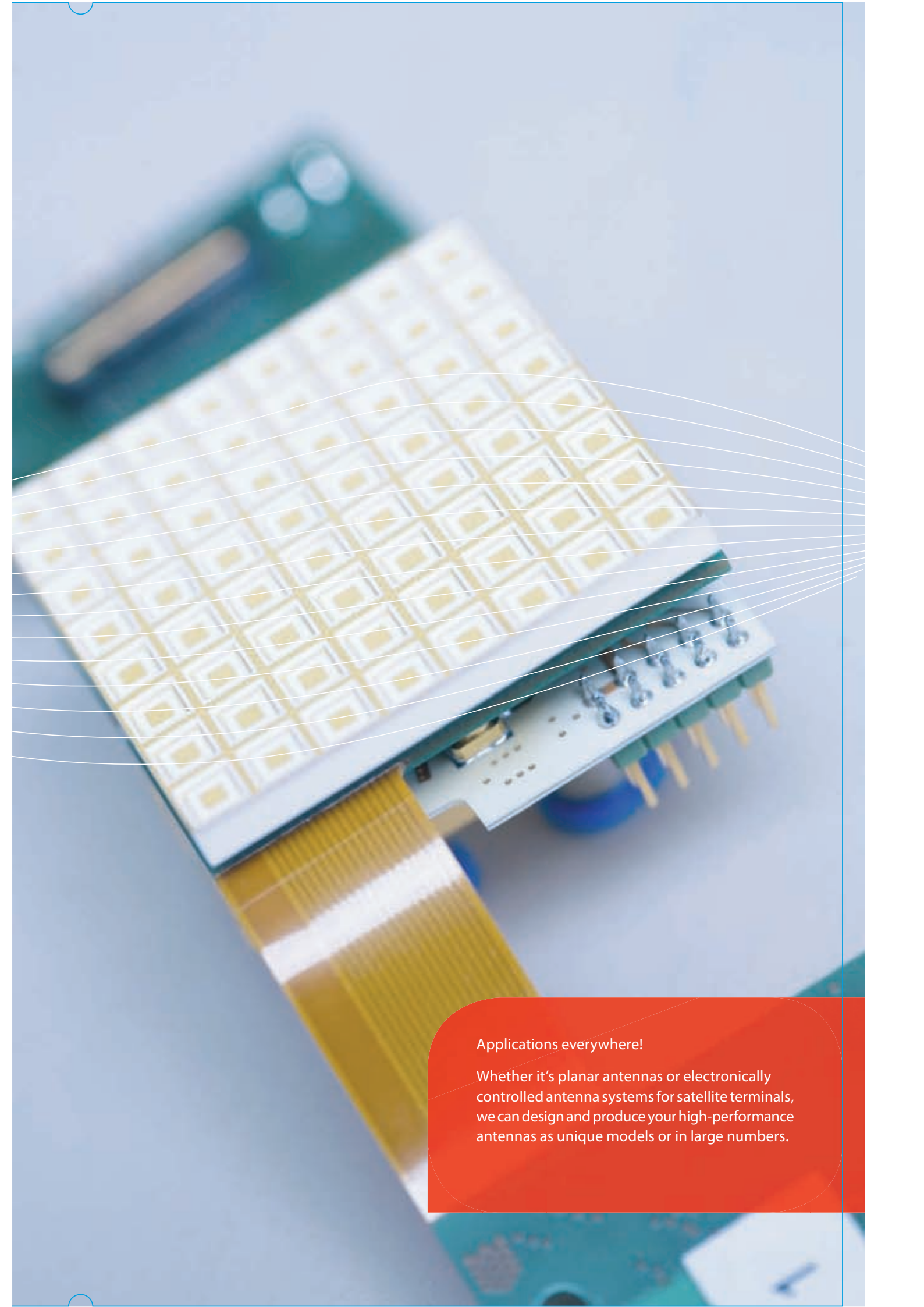
The development of high-performance antennas is a core element of IMST's product line. Our intensive fundamental research – for example, in electronically controlled antennas – has made us one of the world's leading innovators in this field. You can find our high-performance antennas in mobile telephones, vehicles, airplanes and ships.

At IMST, you are our partner, not just "a customer." We are dedicated to research, development and service to our clients so that we can provide needs-orientated, individualized solutions.

Our antennas and systems are designed and produced according to your instructions and applications – mobile satellite communication, complex radar systems, cellular radio terminals or radio modules. Our services include planning the initial concept, producing prototypes, and on-site licensing. Whether you need planar antennas or electronically controlled antenna systems for satellite terminals, whether you need one unique antenna or hundreds of identical ones, IMST is your source.

Through strategic cooperation with our industrial partners, we can supply large quantities of the antennas we design. The components and modules at the core of every antenna are based on our extensive design experience and high-performance simulation and measuring instruments. Our partnerships also allow us to design and create extremely complex active antenna systems. If you are seeking high-quality, custom-fit solutions for sophisticated applications, contact us.





Applications everywhere!

Whether it's planar antennas or electronically controlled antenna systems for satellite terminals, we can design and produce your high-performance antennas as unique models or in large numbers.

> WWW.SCHALTUNGSTECHNIK.IMST.DE

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MICRO-ELECTRONIC
CIRCUITS FOR RADIO, RADAR
AND INDUSTRIAL METROLOGY

> CIRCUIT TECHNOLOGY

Circuit Technology

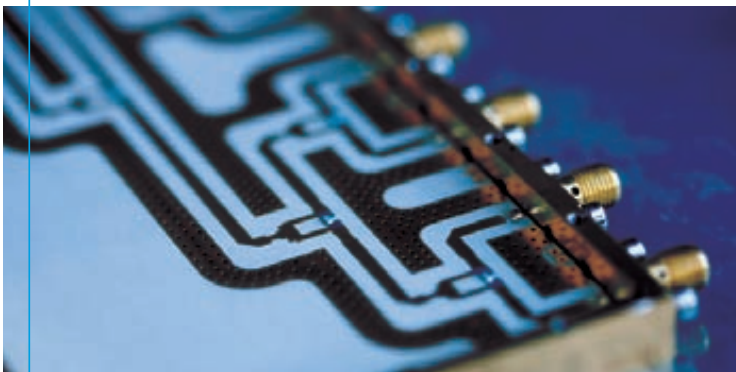


CUSTOMIZED CHIP DESIGN IN THE LOWEST AND HIGHEST FREQUENCY RANGES

The development of micro-electronic circuits, or chip design, is a core ability at IMST. Our circuits can be found in diverse applications like radio communications, radar technology and industrial metrology.

The frequencies that we work with are of particular importance. We cover ranges from the lowest to the highest frequencies. Various integration levels are also available: completely miniaturised as integrated circuits in Si- or III-V technology, as LTCC-modules (Low Temperature Co-fired Ceramics), and, with the largest dimensions, classic printed circuit boards. From the smallest to the largest circuits, IMST has a complete repertoire!

Since the price of chips has plummeted in recent years, many companies have abandoned designing chips for integrated circuits. Our chip design team of 20 development engineers takes responsibility for cost optimization and tailor-made, client-specific circuit development. We make sure that our circuits perform all the functions you need, comply with environmental regulations, and are absolutely competitive. Our success in this market segment is proof!





Innovation Through Experience

Our chip design team constantly proves that quality circuits can be designed at extremely competitive prices – customer service included.

> WWW.WIRELESS-SOLUTIONS.DE

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ON THE BALL – WIRELESSLY!

> WIRELESS SOLUTIONS

Wireless Solutions



RADIO – THE KEY TECHNOLOGY OF THE 21st CENTURY

Wireless communication systems are increasingly important in all areas of daily life. Learning from the telecommunications sector, industry and private households soon demanded the benefits of being “wireless”. Whether the field is communications, location via radio, or narrow and broadband radio systems, the uses of wireless applications are unlimited!

We are continually expanding our know-how in developing services for wireless systems. Our target-orientated approach has allowed us to play a decisive role in the success of many well-known companies’ products across a variety of business sectors, such as process automation, building automation, medical technology, and the automotive sector.

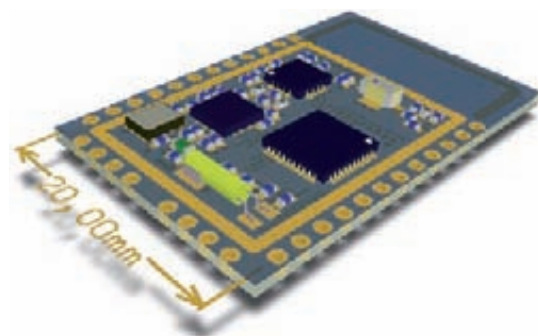
We can assist you at any stage of product development – from feasibility studies to system design and fabrication, to certification. One of our special strengths is our ability to draw on the comprehensive fund of knowledge within our organization. We also have the connections to produce your new product using one of our partner companies.

WiMOD™

We have our own product group in WiMOD™ – a range of pre-qualified radio modules for the license-free ISM bandwidth 433/868 MHz and 2,4 GHz. Our starter-kit and software provide a quick entrance to wireless technology.

Hardware and software can be adapted to customer needs quickly and cheaply at any time. If you prefer, we can support you with the integration of a WiMOD™ Module into your product. We can also create custom radio solutions to your specifications. Detailed information can be found on our website www.wireless-solutions.de.

Try us out – we provide complete service!





Communicate Wirelessly

Wireless communications systems from IMST have already been successful in process automation, building automation, medical technology, the automotive industry, and security technology.

> WWW.PRODUKTE.IMST.DE

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HIGH-PERFORMANCE, PRECISION, SPEED

> DESIGN TOOLS

Design Tools



“MADE BY ENGINEERS FOR ENGINEERS!”

Made by engineers for engineers – this is our motto for our highly-developed design software for drafting circuits. These products are used worldwide as interactive, high-performance development tools for high-frequency technology.

IMST has optimized software tools such as Empire XCcel™, MultiLib™, Coplan™ and Topas for your specific applications. They all share extraordinary high-performance, precision and speed during the simulation and synthesis of circuits. Each of these tools has a user-friendly interface and is continually being improved by our developers.

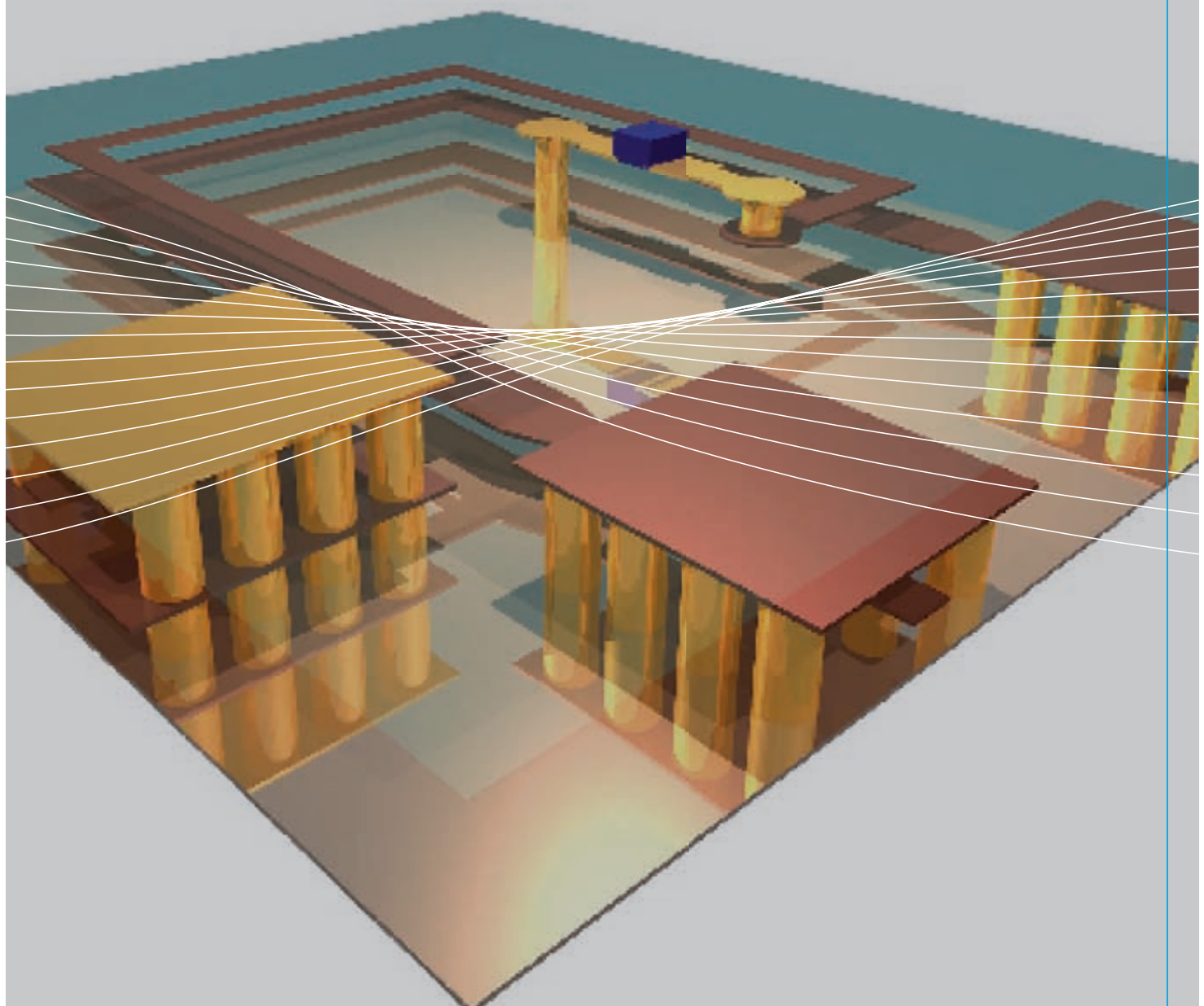
These products are distributed through our network of international sales representatives. You benefit from ever-expanding levels of support, particularly by on-site services.

Application Areas

While Empire XCcel™ (www.empire.de) is used for three-dimensional simulations of electromagnetic fields, Coplan™ (www.coplan.imst.de) is a comprehensive library of tried and tested models for co-planar circuit technology. Coplan™ is specially optimized for Agilent's ADS™ – Advance Design System. MultiLib™ (www.multilib.de) is a newly developed software application for calculating multilayered circuits (Multilayer) and is also integrated into Agilent's ADS. MultiLib™ provides numerous options in the definition and calculation of coupled circuit structures, with no restrictions on horizontal or vertical arrangements, allowing you to calculate complex circuits.

Topas (www.topas.imst.de) – TransistOR Parameter Scaleable – is a non-linear model for the simulation and parameter extraction of semi-conductor construction elements, such as field effect transistors.

The current versions and product descriptions are available on our website. Please note that we also offer regularly scheduled training seminars for those who wish to learn more about our design tools.



Software – Quality Tools with Expert Support

With IMST, you get a user-friendly interface and continually improved software solutions. Our international network of representatives guarantees outstanding on-site service.

> WWW.EMPIRE.DE

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ONE OF THE FASTEST FIELD
SIMULATORS IN THE WORLD

> **EMPIRE XCcel™**

Empire XCcel



EMPIRE XCcel™ – EFFECTIVE 3D-EM SIMULATION

For engineers, Empire XCcel™ is synonymous with challenging 3D simulations of electromagnetic fields.

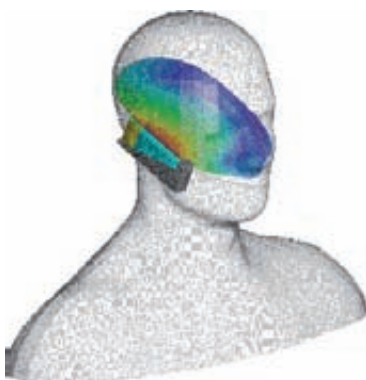
This simulator was originally designed by IMST engineers 10 years ago for their own projects because nothing like it was available at the time. Since its launch in 1998, this product has successfully established itself in both domestic and international markets.

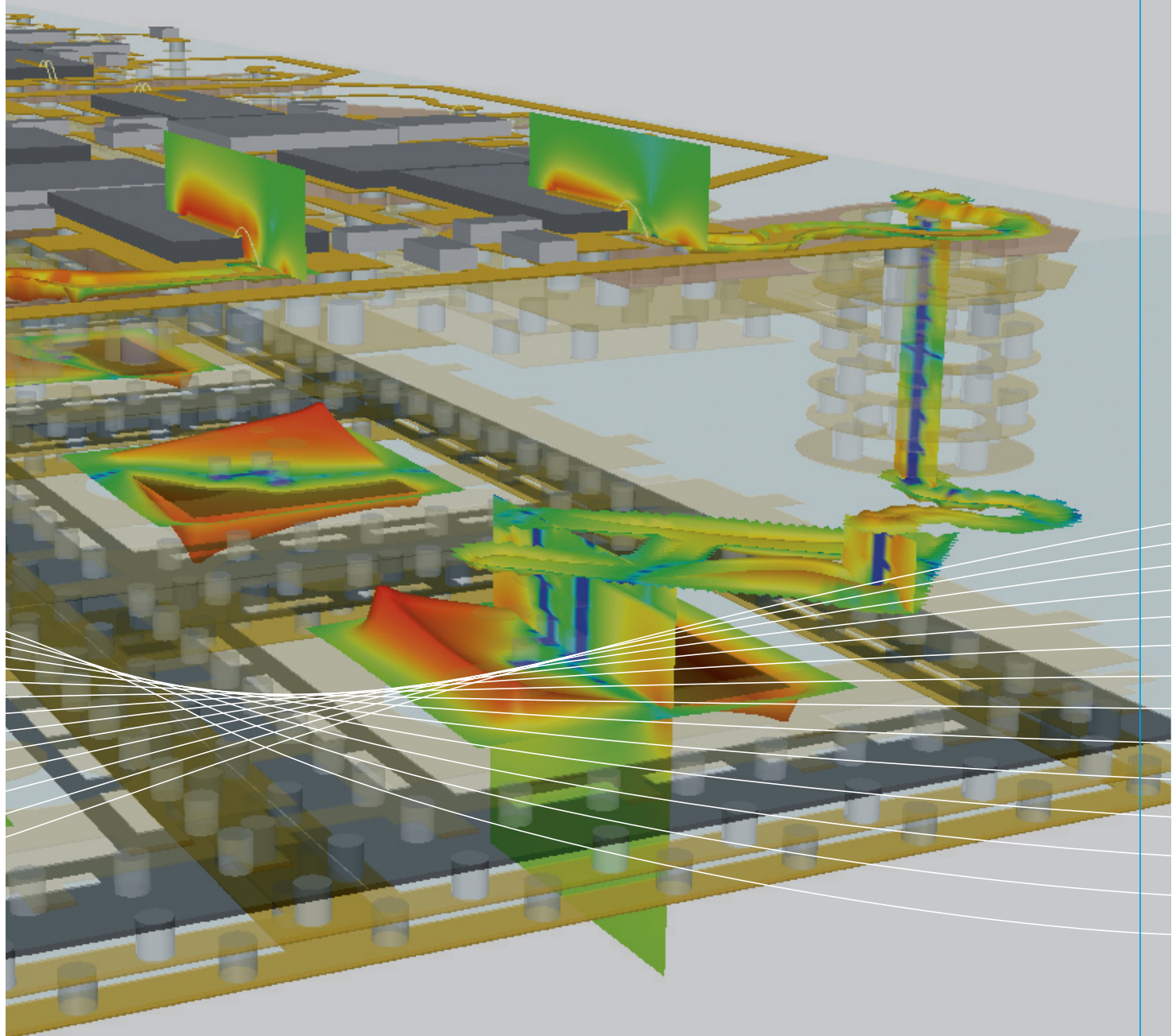
Empire XCcel™ (www.empire.de) is based on the high-performance Finite-Difference-Time Domain-Method (FDTD), which is an industry standard for development of RF components and antennas. International benchmarking tests have verified that Empire XCcel™ is one of the fastest and most precise field simulators in the world!

The simulator's range is enormous – from semi-conductor packages to the propagation of electromagnetic waves in the interior of airplanes – Empire XCcel™ quickly provides precise calculation for large or small applications.

Our clients value the high quality of our simulator and the extensive application know-how of our staff. In our seminars, participants learn 3D-EM-simulation and the FDTD method. They also receive intensive training in the various applications for antennas, HF-components, printed circuit boards and hollow conductors. We also provide an overview of specialized areas, such as MEMS, EMV and LTCC, as well as resonance estimations, far field transformation, parameter variations, loss calculation, and optimization.

For many years our commitment to quality and dedication to service have distinguished our relationships with our business partners all over the world.





For over 10 years, the state-of-the-art Empire XCcel™ has been one of the world's fastest field simulators. Its application bandwidth is remarkable. With Empire you can calculate everything from semi-conductor packages to wave propagation in airplane interiors.

> WWW.EMBEDDED-SYSTEMS.IMST.DE

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INTEGRAL, INTELLIGENT, VERSATILE

> EMBEDDED SYSTEMS



SOFTWARE-GEARS WITH ABSOLUTE PRECISION

Embedded systems have become an integral part of product development. It is hard to imagine life without them, and of course IMST has gathered comprehensive knowledge in this area.

Embedded solutions are also an integral part of control systems for instruments, buildings or vehicles. These systems are often equipped with “intelligent” control and multiple functions that can be activated via communications software. This modern mobile technology requires absolute precision. Metaphorically speaking, software “gears,” such as signal processing, multiple access, administration of radio resources, routing, and other communications protocols, must fit together and mesh properly in real time.

We enhance conventional embedded systems through our “radio” components. Our focus is on application-orientated radio networks designed specifically to meet your needs. We also save you time, effort, and money by taking over the implementation of the complete software architecture for mobile devices, removing difficult coordination problems.

i_way

IMST supplies innovative solutions in mobile gateway and wireless router technology. Our software framework i_way easily establishes remote access for mobile embedded systems. i_way is remarkable for its modularity and ease of migration.

The hardware-orientated functions in the physical layer, also referred to as “basis band signal processing,” perform the work of sending and receiving complex, digitally-modulated radio signals.

Embedded cores

Our longstanding experience in implementing various radio modems has allowed us to develop libraries of IPs that can be directly converted into hardware implementations. These form the cornerstone for every client-specific solution and guarantee the shortest possible development times with the highest quality results. We can only provide a brief overview here of our capabilities, but we have comprehensive know-how in critical areas like location and navigation, and proprietary system design for wireless routers (Universal Mobile Data Access), ultra broadband (UWB), Bluetooth or WLAN system development.

IMST
7162/1
CHANNEL

The one-stop solution for software architecture

Optimize your radio network: we supply innovative, complete solutions for embedded systems, gateways and wireless routers at attractive prices.

> WWW.IMST-TESTCENTER.DE

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ACCREDITED MEASURING
AND TESTING CENTER

> **CONTROLLING
& TESTING**



Controlling
& Testing

ONE OF THE LARGEST TESTING CENTERS IN GERMANY

IMST's accredited testing center provides many critical measuring and testing services in accordance with CE, EMV guidelines, for example, and SAR values, for radio devices and mobile phones. These tests are carried out under national, European, and international standards as appropriate for your requirements.

We also offer professional measuring technology to test the performance capabilities of antennas, HF materials, circuits, and even complete systems such as GSM/UMTS. For quality and reliability testing, our center has protocols for mobile phone batteries and environment simulations – temperature, humidity, and mechanical tests – which are important distinguishing features of modern products.

In addition to device-related acceptance and approval controls, component characterization, and end product tests, we also provide our clients with safety inspection and evaluation in electric, magnetic and electromagnetic fields, e.g. according to 26. BImSchV or the Accident Prevention and Insurance Association's guidelines (BGV/BGR B11) etc.

Our testing center is committed to the highest standards of quality and to prompt, punctual and tailor-made service. If we cannot accommodate your request, we have a constantly growing network of expert partner laboratories who can work with you.

With IMST, you get these benefits:

- + one contact person for every service
- + highly flexible, cost-effective service
- + expert consulting throughout the development process and product testing

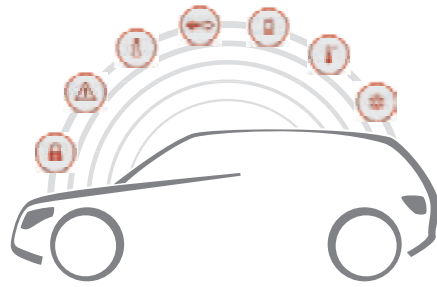
Our 10 year presence in the market proves our success!

IMST's testing center has been certified and accredited according to the DIN EN ISO 9001:2008 and DIN EN ISO/IEC17025. Our testing laboratories have also been recognized by the Federal Office of Motor Transport. As an independent testing institute, we also have extensive qualifications for end devices, such as the CTIA and mobile network operators.



Safety for Everyone

Our testing center clients include environmental authorities, ministry offices, real estate authorities, mobile network and facility operators, companies, action groups, and private individuals.



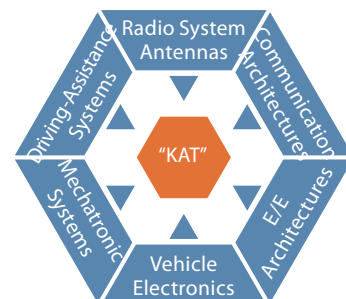
COMMUNICATION AND LOCATION TECHNOLOGY FOR THE AUTOMOTIVE INDUSTRY

We know that the future belongs to those with the most innovative technology. Only ongoing creative development and commitment to engineering leadership will keep Germany at the forefront of the global market.

With the expansion of our premises early in 2009, IMST also laid the foundation stone for the Competence Center for Automotive Technology, abbreviated as "KAT" in German. The focus of this new center is developing cutting-edge communication and location technologies for automotive electronics. This includes technologies like car-to-car and car-to-infrastructure communications, communication and routing platforms, location and navigation based on radio technology as well as driver assistance and remote door-locking systems.

KAT also deals with the development of novel components for vehicle radio technology, such as wireless sensor networks, tire pressure sensors, radar sensors, and special antennas.

With the help of important partners from science and industry, our ultimate aim with this project is increased vehicle safety. One area is advanced radio technology that allows vehicles to exchange traffic information to prevent accidents. Another example is our work on a new type of radar system to improve identification of objects in the immediate vicinity of a vehicle, thereby reducing accidents.



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AUTOMOTIVE INDUSTRY,
ENERGY MARKETS,
AND MEDICAL TECHNOLOGY

> SPECIAL PROJECTS





ELECTRO-MOBILITY AND ENERGY EFFICIENCY – ECOLOGY AND ECONOMICS IN PERFECT HARMONY

Rising energy prices and stricter environmental specifications are a result of the ever-increasing global demand for growth. This demand has caused increased consumption of natural resources. New technologies that can reduce or reverse consumption are high priorities. We see enormous growth potential for engineering services in this market sector.

IMST and its project partners are developing products and technologies that will make sense economically and ecologically. These are worthwhile efforts that we hope will produce a sustainable growth strategy for all of us.

The major challenges are to purify the air and to develop clean energy via innovative technologies. This is why we are working with our partners on the sustainable reduction of CO₂ emissions. We are also pursuing novel propulsion concepts for vehicles and concepts to optimize the efficiency of wireless energy transmission. IMST is working toward a considerable reduction of environmental degradation and more efficient electric vehicles.

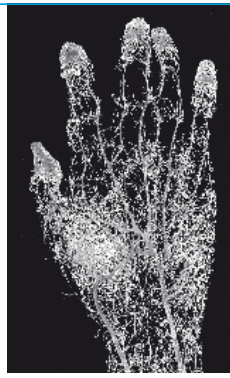
Smart Metering

Increasing attention is being given to “intelligent” meters, also known as Remote or Smart Metering. These metering systems transfer water, heating, and electricity billing information via wireless data communication to the user and the provider. The European Commission has issued guidelines on the implementation and function of these systems.

Smart metering systems simplify and reduce the cost of billing. They can be installed in a building entrance, a cellar, or inside a house or apartment because there is no need for a worker to read the meter directly. A small device wirelessly transmits consumption measurements. Our role is the development of the radio transmission aspect of this process. Tailor-made proprietary approaches and standard solutions based on ZigBee™ are already available.



MRT Today



MRT in the Future

IMPROVED QUALITY OF LIFE THROUGH INNOVATIVE MEDICAL TECHNOLOGY

We live in a society with an increasing number of elderly people and people of all ages needing health care. To limit costs, providers are turning to integrated and intelligent assistance systems that enable people with medical problems to remain in their homes instead of living in expensive care centers, like nursing homes.

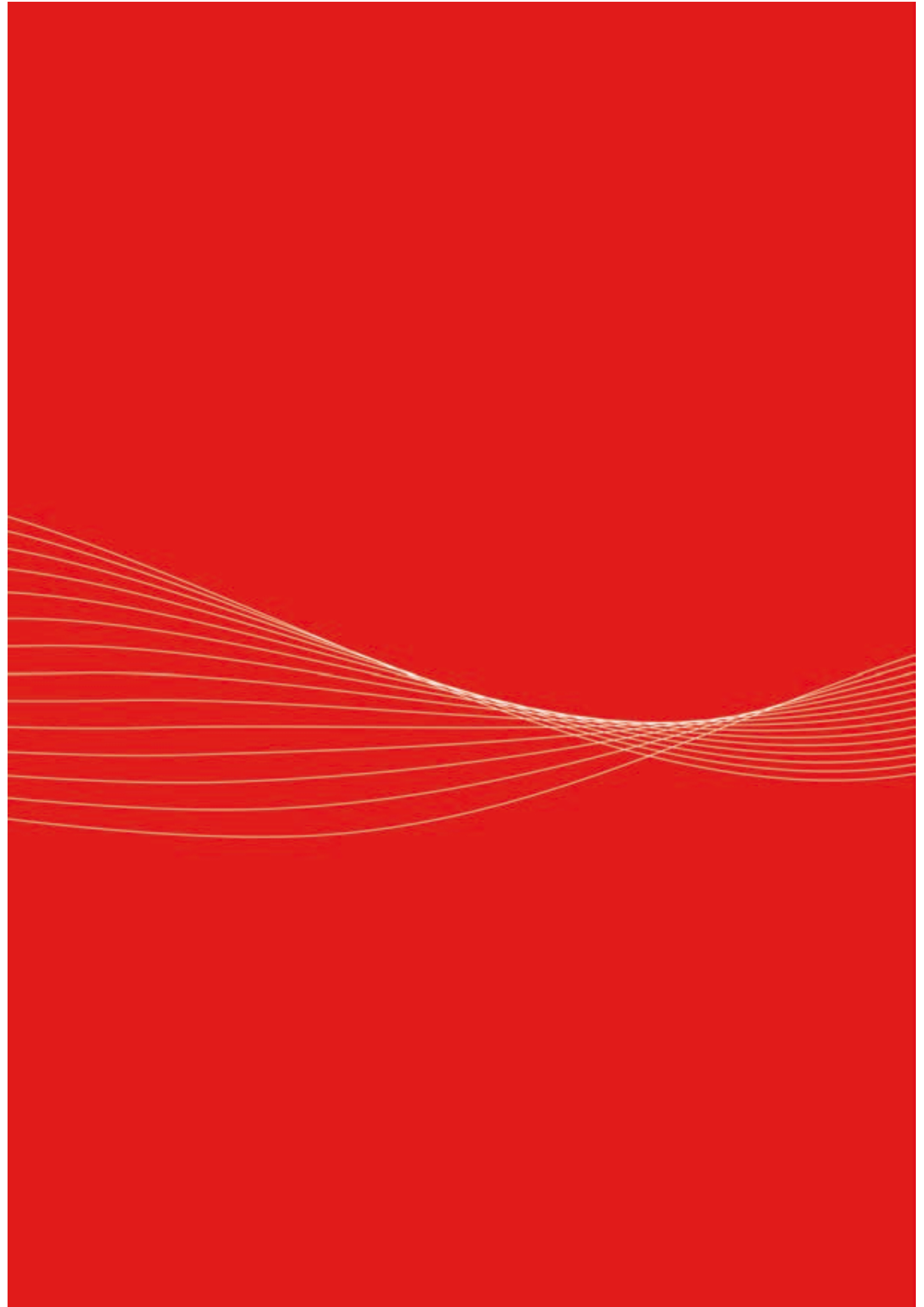
IMST is focussing on this promising future market and is indirectly benefiting from the demographic shift and accompanying medical advances. We are working with manufacturers and associations to create new products.

AAL (Ambient Assisted Living) technologies are making a significant contribution to the hope of individuals who want a long and independent life in their own homes. The services provided by AAL include assistance with daily duties, health and activity monitoring, and access to emergency service systems. Users of these technologies will require less direct medical attention and care from their families or other providers.

IMST is committed to the development of these radio-based assistance systems.

MRT – the view inside

We are extremely proud of our innovations in the field of MRT (Magnetic Resonance Tomography). In currently available technology, MRT machines work with a power of 3 Tesla (magnetic flux density). IMST engineers and experts from Essen's Medical University, SIEMENS, and the University of Duisburg-Essen, have developed an innovative, multi-channel, high-frequency reception coil for devices with magnetic fields of up to 7 Tesla (magnetic flux density). The result will be pictures with an incredibly high resolution and sensitivity. Tumors and vascular wall damage can be identified at far earlier stages, which will allow earlier and more effective medical intervention.



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