

Rosenberger

Medical & Industries

Innovative Solutions for Medical, Industrial and Consumer Markets





A SYNONYM FOR QUALITY AND INNOVATION.

On the following pages we present the complex and diverse range of innovative, high-quality products developed in our Medical & Industries Business Area.



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Rosenberger Online Catalog

Our Rosenberger Online Catalog contains the current standard product range with specific details, including data sheets, assembly instructions and panel piercings.

catalog.rosenberger.com

WELCOME TO ROSENBERGER.

The roots of Rosenberger start as early as 1958. Since then, Rosenberger has grown from a small tooling shop to a global manufacturer of connectivity solutions.

The Rosenberger Medical and Industries Business Area was created in 2008 to design and produce customized and standard products for these specific markets. From the beginning we have developed a close and open relationship with our customers which was and is a key for early project involvement and understanding of the specific customer applications. Being an integral part of the overall value chain enables us to create products and systems helping to improve the solutions and services of our customers.

Over the past decades, Rosenberger has gained deep knowledge in data transmission technology, connector and system design and highly automated production methods: From high temperature connectors for industrial and consumer applications, high voltage and magnetic easy mating connectors for medical systems, to complete machine to machine (M2M) communication systems applicable across industries. With a very high degree of in-house production, we ensure quality control and cost effectiveness of our products.

But besides offering innovative technology and products, as a family owned business, Rosenberger stands for a long term and personal relationship with our customers. In the end people work with and for people and a trustful relationship is what makes a project successful.

Sincerely yours,

Dr. rer. nat. Tosja Zywiets
Rosenberger
Chief Strategy Officer

Folke Michelmann
Business Area
Medical & Industries,
Vice President



Folke Michelmann

Tosja Zywiets

HOME OF INNOVATION.

A global network of Rosenberger research & development and production centers provides innovation, optimized cost structure and outstanding local customer service.





COMPANY PROFILE

Rosenberger is one of the worldwide leading suppliers of controlled impedance and optical connectivity solutions, system components for mobile communications networks, data centers and test & measurement as well as high voltage contact systems.

ROSENBERGER GROUP

EUROPE

- **Germany:** Fridolfing, Augsburg, Laufen
- **Hungary:** Jászárokszállás, Taksony
- **Denmark:** Birkerød
- **Sweden:** Kista, Solna, Ytterhogdal
- **Spain:** Madrid
- **United Kingdom:** Blackburn

NORTH AMERICA

- **USA:** RNA Plano, RNA Akron, RNA Pennsauken, RSS Lake Charles

SOUTH AMERICA

- **Brazil:** São Paulo
- **Chile:** Santiago

ASIA

- **China:** Beijing, Kunshan
- **India:** Manesar

Rosenberger's quality philosophy is not just to optimize components and products, but to continuously improve and enhance all processes. From product development, planning, procurement, production, sales, logistics and services to environmental policy, Rosenberger aims to offer maximum benefits to our customers all over the world.

Our quality responsibility includes being proactive in protecting our environment and natural resources. We endeavour to avoid any environmental pollution, even beyond the requirements of legal regulations whenever possible.



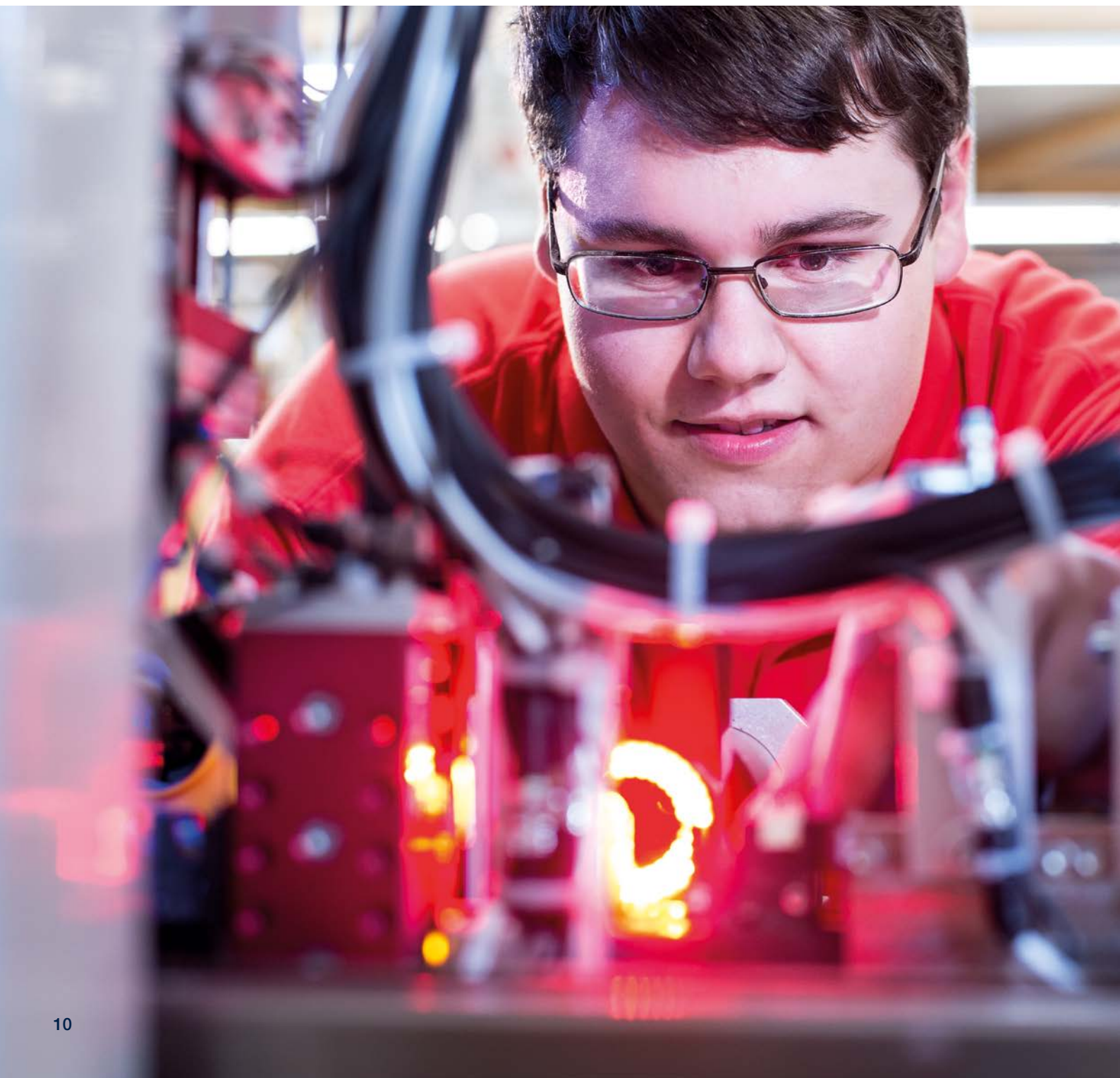


OUR PROMISE TO YOU. AND TO THE ENVIRONMENT.

The quality of our products, solutions and services is an essential part of our corporate strategy.

CREATING THE FUTURE.

The development of technology for the future is deeply anchored at Rosenberger: We are today working on products and solutions that will shape our future lives.





MARKETS CHANGE. PRODUCTS CHANGE.

We want to get faster and smarter in what we do and how we do it.

ENVIRONMENT

Environmental issues, such as limited energy and raw material resources are a driving force which is focusing us to create more efficient products. Customers are demanding up to date services and technologies to be available in real time and with even higher performance. This requires smarter solutions with higher bandwidth, less weight, longer battery life and better usability.

THE INDUSTRIAL WORLD IS NOW ALSO THE DIGITAL WORLD

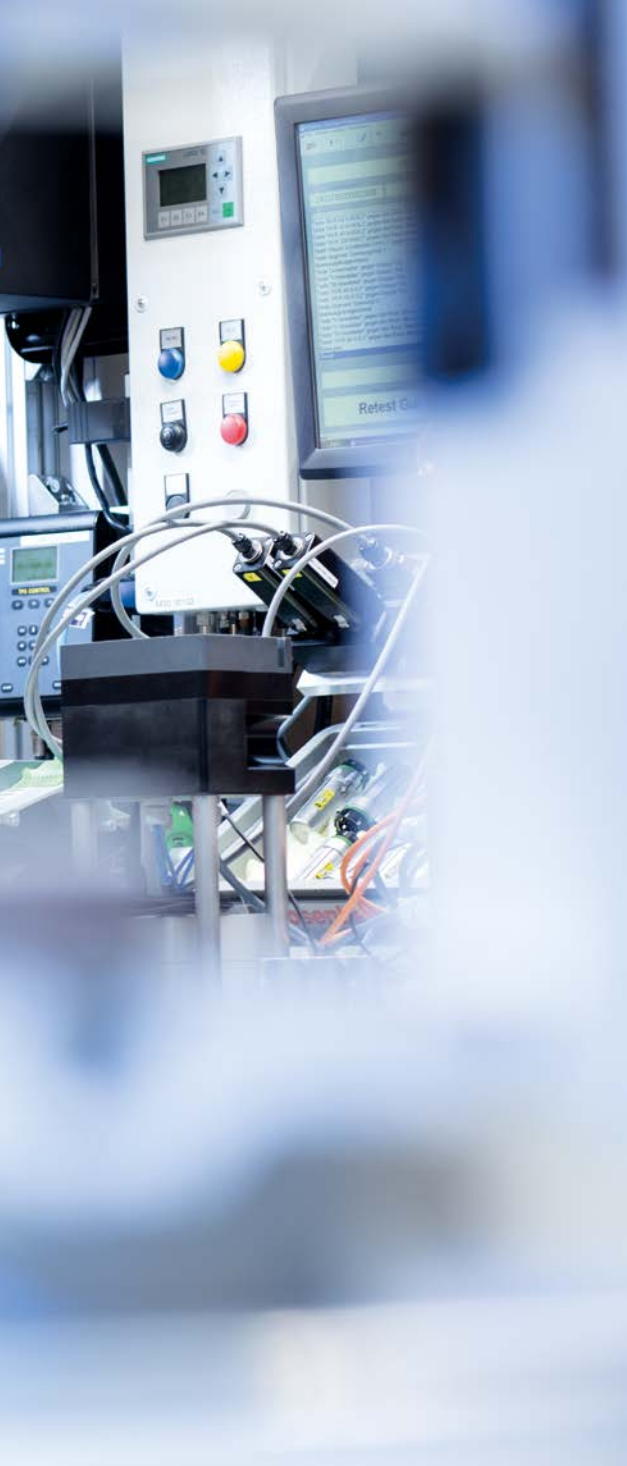
Now we are facing the next big step in evolution with Industry 4.0. Processes are getting smarter in the supply chain, production, logistics and customer service.

But M2M is more: It penetrates our everyday private and professional lives with the "Internet of Things" and makes it easier and safer.



DRIVEN BY PERFECTION.

Rosenberger's mission is to be an innovation and technology leader within its business segments.



OUR COMPETENCIES

The most modern manufacturing technologies, the highest possible levels of efficiency in production and continuous development are our core competencies, guaranteeing not just fast delivery and strict adherence to delivery dates, but also the highest level in product quality.

RESEARCH & DEVELOPMENT

Scientifically-based high frequency know-how enables us to continuously improve existing products and to design innovative products and solutions whether standard or customer-specific. Numerous patents are a proof of Rosenberger's leadership as a creative and innovative partner.

ASSEMBLY

As a global supplier of high frequency, fiber optic and power connectivity solutions, Rosenberger operates manufacturing and assembly locations around the world which produce connectors, cable assemblies and components for the automotive industry.

PRODUCTION

Rosenberger is proud to offer as much in-house production as possible whether on RF, power or fiber optic components or at a system level. This includes leading edge production equipment, automated assembly lines and quality and cost-effective solutions, all working within a streamlined process.

Rosenberger is certified according to ISO/TS 16949, DIN EN 9100, ISO 9001 and ISO 14001.

PLATING TECHNOLOGY

Whether corrosion protection, optimized conductivity or other technical and physical features, our components are quickly and flexibly electroplated in our in-house electroplating plant.

INJECTION MOLDING

The most modern machinery and methods as well as the use of special materials and components form the basis for precision and durability of our tools and products. Rosenberger is able to process all available high-performance plastics.

MEDICAL & INDUSTRIES

The Rosenberger Medical and Industries Business Area creates innovative products for medical, industrial and consumer markets. In close cooperation with our customers our offering is the complete product development from the first idea to volume production.

The Medical and Industries team is located in Germany and USA. As part of the Rosenberger Group we use the synergies of research and development, purchasing, production and sales know-how and resources around the world.

Rosenberger's core competencies are:

- Mechanical design
- RF design
- Electrical and optical data transmission technologies
- Enclosing solutions in metal and plastics for components and complete systems
- Connectivity solutions
- Electronic systems on circuit boards

Our business is project-oriented, we are highly customer-focused in what we do and therefore the definition of development schedule, selection of production technologies and materials, use of know-how in development and production with internal resources or with external partners is standard for us.

The Rosenberger Group is used to handle small and large production volumes utilizing our global manufacturing infrastructure.







MODERN CONNECTIONS ARE EASY TO MATE.

Rosenberger magnetic connectors are vibration-proof, cleanable and guarantee a correct connection even in the most inaccessible locations. A further benefit is the "break-away function", which prevents damage to the connector by unintended disconnection.



MAGNETIC SELF-MATING CONNECTORS

Magnetic connectors offer conventional features such as a high number of mating cycles, vibration-proof and combined current, data, LAN & RF connections, but also the advantages of a self-mating magnetic function, prevention of misconnections, easy cleaning and therefore guaranteeing a correct connection in the most inaccessible locations. An important benefit is the break-away function, which prevents damage to the application by unintended disconnection.

Product Features:

- Current up to 40 A
- Flexible voltage range
- Mating cycles >10,000
- Reliable contact pressure and zero-force mating
- Shock and vibration proof
- Waterproof
- UV resistant
- Available in various design versions

Benefits:

- Easy and fast connecting
- High number of mating cycles
- Break-away function

Applications:

- Combined power, data, LAN and RF
- Medical equipment
- Heating system
- Industrial automation
- Outdoor area systems
- Consumer products



RoPD®

Rosenberger Power Data Connectors (RoPD®) were developed for the Light Electric Vehicles Industry (LEV). The contact system consists of 4 data contacts and 2 power transmission pins. Available designs include: Cable assemblies black and white as well as panel connectors.

www.rosenberger.com/ok/ropd



RoDI®

Rosenberger Diagnostic Interface Connectors (RoDI®) are recommended for building services, industrial control and bus systems. The contact system consists of 5 contacts. Available designs include: PCB and panel connectors and cable assemblies.

www.rosenberger.com/ok/rodi



MultiMag

MultiMag connectors are designed for small and compact applications in tight spaces. Available designs include: MultiMag 6 for e.g. USB and MultiMag 15 for general power and data transmission.

www.rosenberger.com/ok/muma



MagneticUSB®

MagneticUSB® solutions are designed for USB 2.0-consumer devices for the various USB connector variants: A, micro-B and adaptor.

www.rosenberger.com/ok/musb



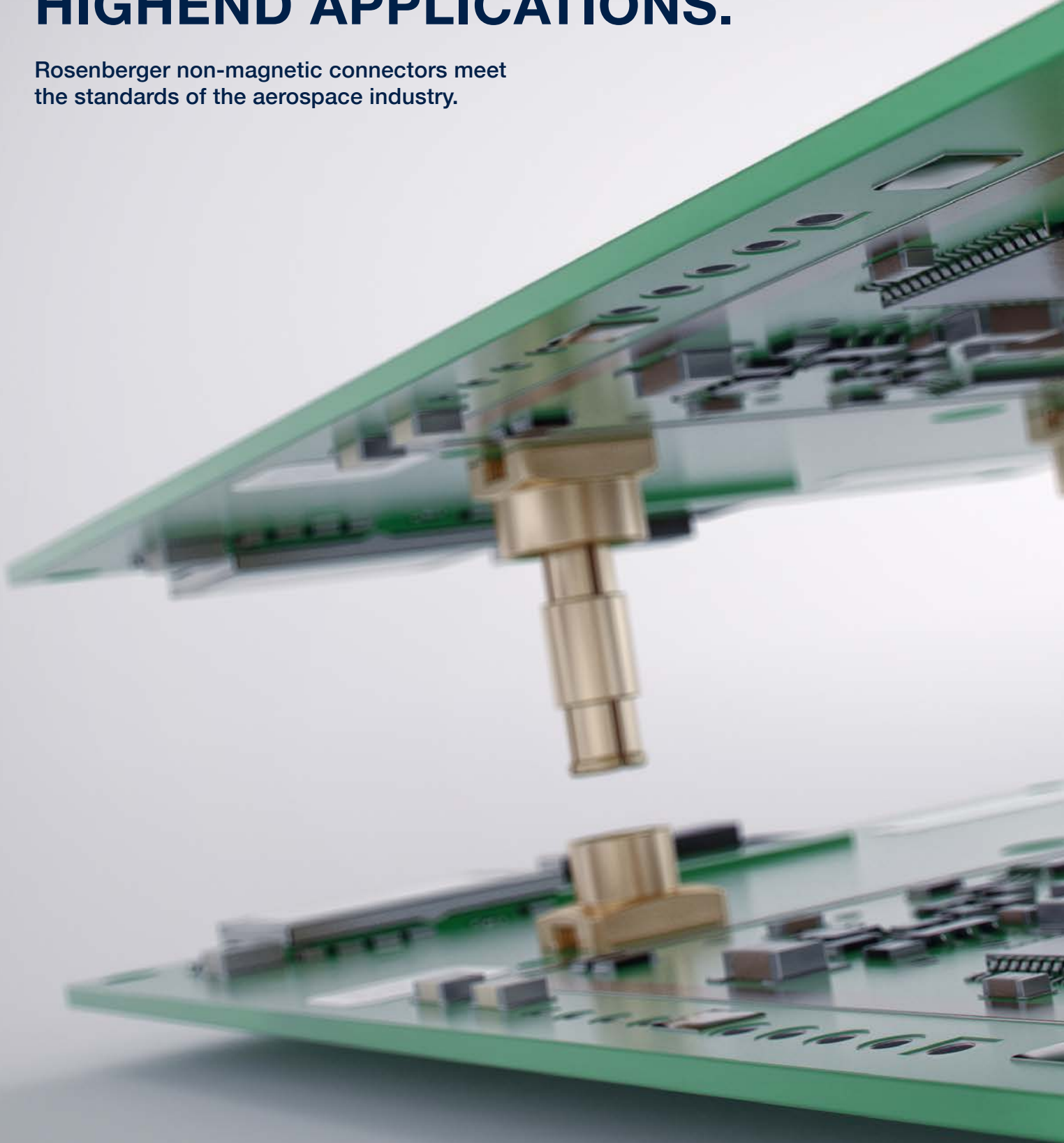
PowerSystem

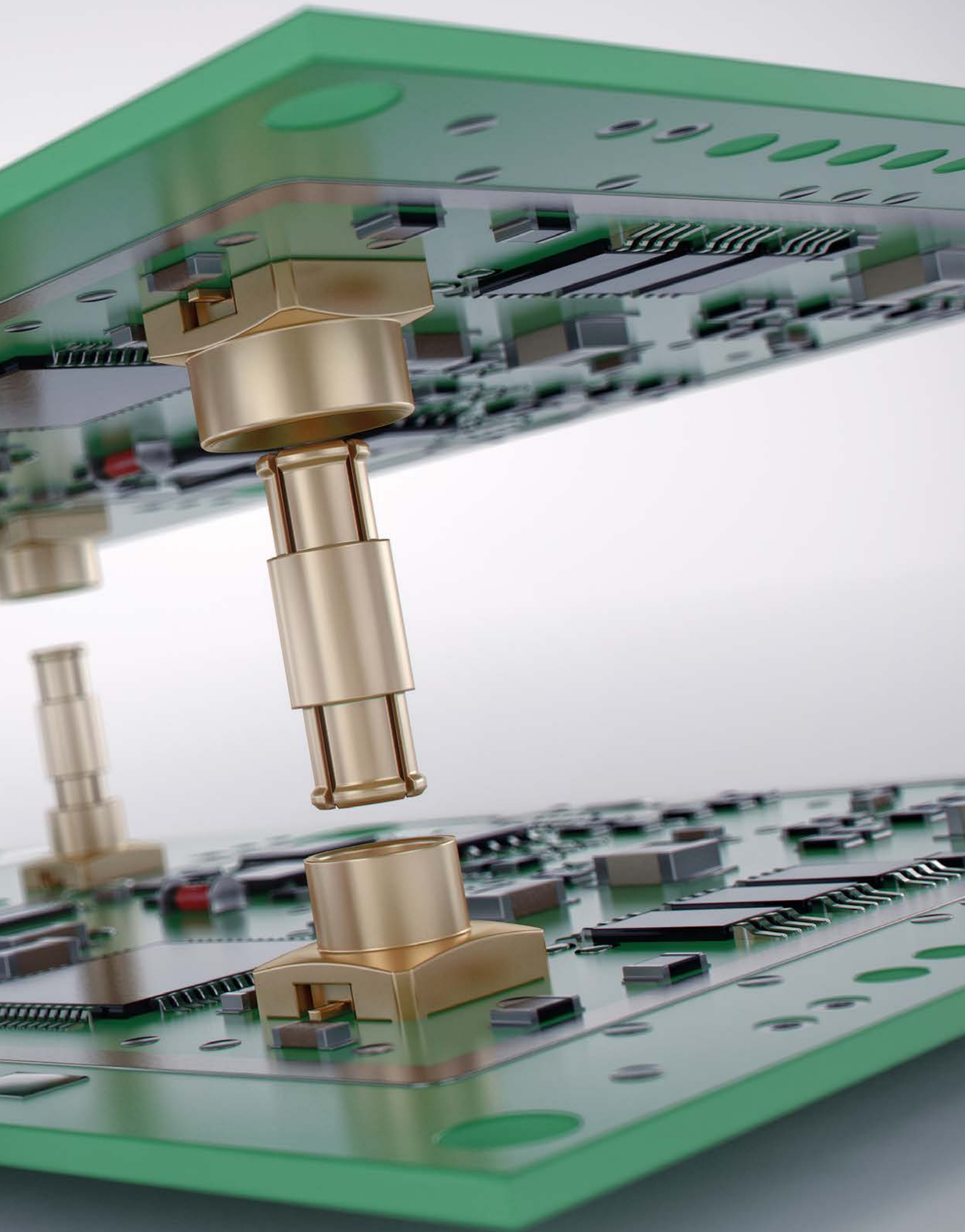
This connector is a magnetic connector system for 12V and 24V with mechanical twist lock. Available designs include: PowerPort straight, PowerClip right angle.

www.rosenberger.com/ok/pows

OPTIMIZED FOR HIGHEND APPLICATIONS.

Rosenberger non-magnetic connectors meet
the standards of the aerospace industry.







NON-MAGNETIC PRODUCTS

Rosenberger non-magnetic products are widely used in MRI (Magnetic Resonance Imaging) equipment, the aerospace industry and industrial applications.

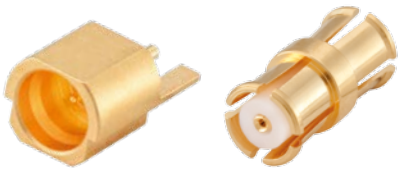
The non-magnetic product range includes standard coaxial connector families, cable clamps and cable assemblies. Customized solutions are available upon request.

Product Features:

- Frequency range DC to 18 GHz
- Current rating typical 2 A
- Data rates up to 10 Gbit/s
- Tolerance compensation > 0.6 mm
- High number of mating cycles up to > 100,000

Benefits:

- Mandatory in special applications, e.g. MRI



SMP Non-Magnetic

Available designs include: Cable and PCB connectors, cable assemblies, adaptors.

www.rosenberger.com/ok/smpnm



QMA Non-Magnetic

Available designs include: Cable and PCB connectors, cable assemblies, adaptors.

www.rosenberger.com/ok/qmanm



Multi Channel Mini-Coax

These are used in low space requirements for high packing densities. Available designs include: PCB connectors, 4 and 8 channel housings, cable connectors, cable assemblies.

www.rosenberger.com/ok/mcmx



Micro-RF Non-Magnetic

Available designs include: Test switches, cable clamps, adaptors and cable assemblies.

www.rosenberger.com/ok/micrnm



PRECISION HAS NO MAXIMUM TEMPERATURE.

Rosenberger's innovative solutions for special environments are made for applications in which standard connectors may not work.

HIGH-TEMPERATURE CONNECTORS

Rosenberger high-temperature connectors are generally used in engine compartments, boilers and ovens. These durable/resilient and customized connector systems are suitable for temperatures up to 450° C. Rosenberger has the know-how of performing thermal and electrical simulations as well as processing high-temperature-proof materials such as ceramics and stainless steel. Different components such as cable assemblies, housing connectors and matched antenna systems are developed in close cooperation with our customers and partners.

Product Features:

- Temperature range up to +450° C
- Corrosion and chemical resistant materials
- Frequency range up to 2.4 GHz
- Non-contact connections
- Variable and fitted housing sizes
- Available in various design versions, e.g. hermetically sealed connectors

Benefit:

- Reliable connector solution in thermally harsh environments

Applications:

- Engine compartments
- Boilers
- Ovens
- Customer specific solutions



High Temperature Connectors
Customer specific assemblies.
www.rosenberger.com/ok/higt

HIGH MATING CYCLE PRODUCTS

Industrial and consumer applications often require a robust user interface for the connection between a special power supply and the device. In these use cases Rosenberger high mating cycle products are the first choice and available in standard and customized versions.

Product Features:

- Up to 100,000 mating cycles
- RF and DC versions
- Emergency disconnection function
- Non-magnetic versions available

Benefits:

- Reduced connector wear leads to longer service intervals and less connector failure
- Longer product lifetime

Applications:

- Test equipment
- Sensor interfaces



High Mating Cycle Products
Customized products.
www.rosenberger.com/ok/higm



HIGH SPEED DATA CONNECTORS

The RosenbergerHSD® interconnect system, based on the star-quad principle, is a symmetrical, impedance-controlled 100 ohms interconnect system for HighSpeedData transmission. Interferences by cross-talk and external sources are prevented, ensuring high-performance transmission quality. Fully automatic component and module assembly reduces the assembly time. Unshielded cable connectors and cable assemblies are also available.

Product Features:

- Data rates up to 1.5 Gbit/s
- Fully shielded twisted quad cables
- Single, Double 8 mm and Double 12.7 mm types
- Primary and secondary lock
- High cable retention force
- Mechanical and colored coding
- No contact pin damage possible
- Waterproof variants

Benefits:

- Transmission of high data rates
- No misconnects: different codings on plastic housings
- Scoop proof-ness

Applications:

Our interconnect system has been developed for automotive electronics as well as for digital infotainment electronics, digital symmetrical networks or even radio base stations. Applicable transmission standards:

- LVDS
- Ethernet
- USB 2.0, 3.0
- IEEE 1394 (Firewire)
- CAN (Controller Area Network)



RosenbergerHSD®

Wide standard product range of board, cable and panel mount connectors.

www.rosenberger.com/ok/hsd

SENSOR CABLES AND CONNECTORS

In conjunction with the appropriate sensors, our cable technology measures force, pressure, acceleration and torque. The piezoelectric measuring technology demands highly insulated coaxial cables and connectors in order to ensure a high insulation resistance greater than 10^{14} ohms throughout the measurement chain.

Product Features:

- Insulation resistance: $> 10^{14}$ ohms
- Operating temperature: up to 200° C
- Interface models: M3, M4, 10-32, for different sensor types and sizes
- Various cable types: e.g. Viton® and Teflon® coated cables or armored cables

Benefits:

- Oil-, dust- and waterproof
- Corrosion-resistant materials
- Vibration stable

Applications:

- Cables for pressure, force, acceleration and torque sensors
- Test equipment for mechanical stress (tension, pressure, torsion etc.)
- Combustion engine development



Sensor Cables

Rosenberger offers sensor cables for vehicle technology, plastics processing and metal machining, as well as assembly and testing technology.

www.rosenberger.com/ok/piezo



GOOD CONNECTIONS ARE PRECIOUS.

Rosenberger Power Supply and Data Connectors combine data and power transmission at the same time.





POWER SUPPLY AND DATA CONNECTORS

Rosenberger power supply and data connector product ranges offer solutions for applications that require high-speed data transmission, ruggedness, high voltage and current capability, water and pressure proofness and EMI-shielding. Application areas include automotive and medical, various battery supply and charging systems, outdoor equipment, AC/DC converters, industrial motors and factory automation.

Product Features:

- Currents up to 200 A, Voltage up to 10 kV
- Data rate: up to 10 Gbit/s, Frequency range up to 5.3 GHz
- Waterproof to IP 68
- Temperature range -40° C to +140° C
- HVIL (high voltage interlock loop)
- EMI shielded
- Touch-safe contacts
- Snap-on/screw locking

Benefits:

- Versatile use for a wide range of supply and signal transmission applications in different industries

Applications:

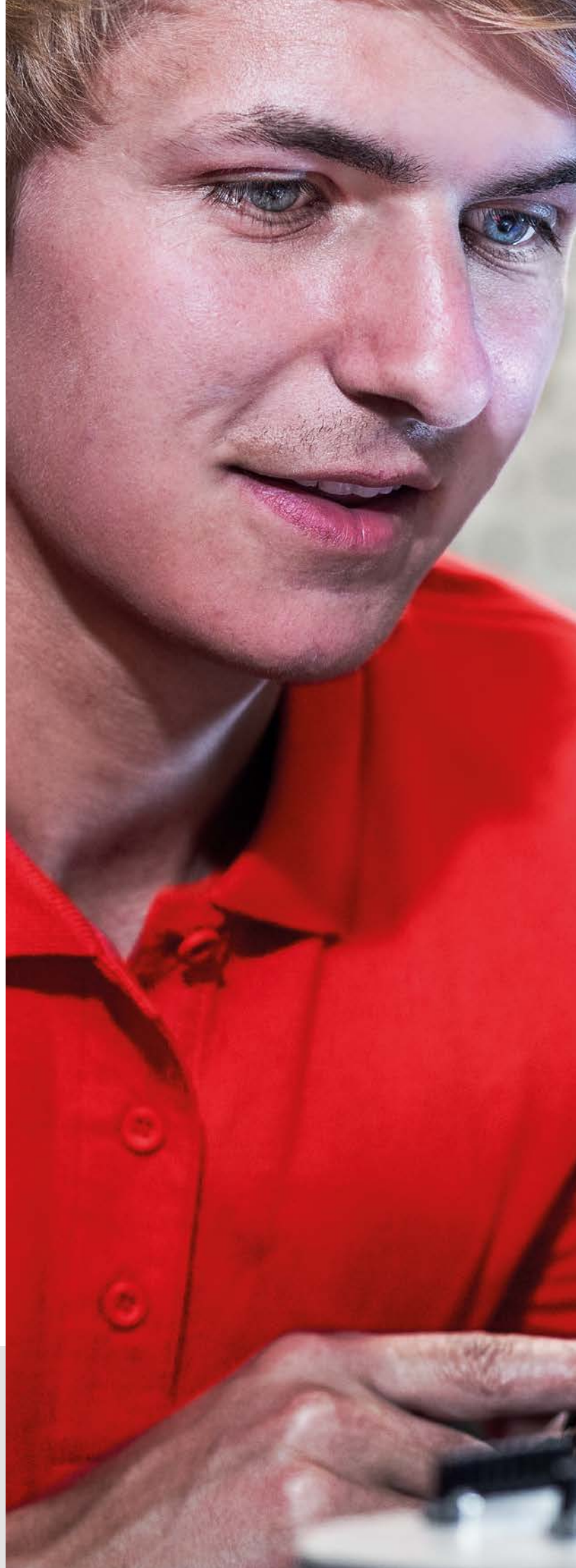
- Equipment for emergency and rescue services
- Battery supply and charging systems in home, mobile and professional systems
- Industrial automation



Power Supply and Data Connectors

High voltage connector with HVIL for medical and industrial applications.

www.rosenberger.com/ok/psda



SLC – SPRING LOADED CONTACTS

Rosenberger offers a wide range of SLC solutions (Spring Loaded Contact) for different designs:

- Impedance controlled SLC for transmission of RF signals in board-to-board applications
- Hybrid SLC solutions with a combination of DC, RF signal transmission, power supply and fiber optical lines
- SLC cable connectors, board and panel mounted products
- Backplane designs
- Products desiring a high degree of tolerance compensation between the mating partners

Product Features:

- Frequency range DC to 6 GHz
- Current rating typical 1.5 A
- Data rates up to 10 Gbit/s
- Tolerance compensation > 0.6 mm
- Mating cycles > 1000

Benefits:

- Easy installation and uninstallation of sub-assemblies
- Application over a wide range of voltage, current and frequency ranges
- Compensation of position tolerance of mating partners within system



SLC (Spring Loaded Contacts)

Available in a wide product range of cable and panel connectors, PCB spring loaded contacts, spring loaded pins and blocks as well as customer specific connector solutions.

www.rosenberger.com/ok/slc



FIBER OPTIC SOLUTIONS FOR ALL ENVIRONMENTS.

Rosenberger Fiber Optic products enable solutions even in harsh environment and deliver optimal results.



FIBER OPTIC SOLUTIONS

The transfer of, continuously rising, high data rates over fiber optic transmission lines is becoming increasingly common, even within industrial applications. This is due to fiber optic systems not being susceptible to electromagnetic interference. Rosenberger offers a complete range of fiber optic solutions complete with all necessary accessories.

Product Features:

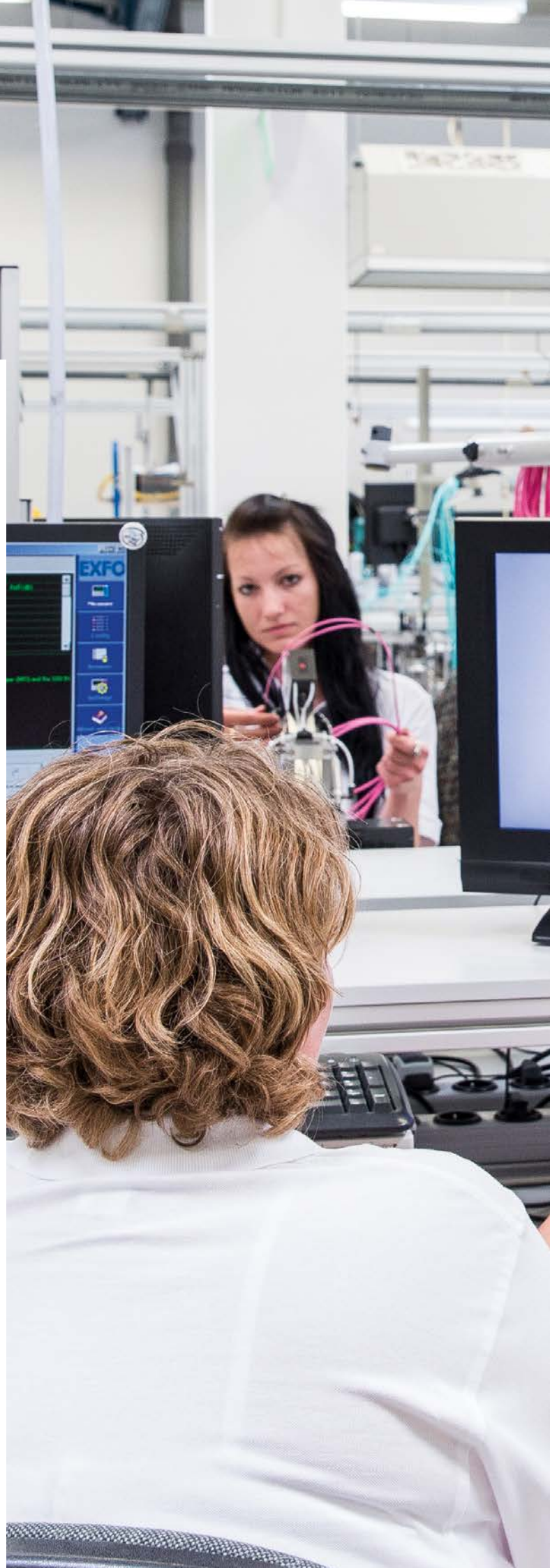
- Optical contacts for singlemode and multimode
- Hybrid connectors in combination with electrical contacts
- High return loss types available
- Customized fiber bore diameter
- IP 67 sealed variants
- Expanded beam technology for less susceptibility against contamination

Benefits:

- Long range as well as high data rates up to 100 Gbit/s
- Low loss data transmission
- Insensitivity against electromagnetic interference
- Low weight

Applications:

- Sensor systems
- Data transmission in high-voltage systems
- Medical (MRT, Laser)
- Robots
- Shipbuilding
- Offshore oil and gas rigs
- Broadcast
- Mining
- Aircraft
- Laser systems



Optical MINI Contacts

With a ferrule of Ø 1.25 „MINI contacts“ allow to build up mixed configurations with a high packaging density. The recommended cavity is compatible with electrical contacts of Rosenberger Mini-Coax connectors.

www.rosenberger.com/ok/opmi

Optical DIN Contacts

„DIN contacts“ are available with metal or ceramic ferrule. Metal types can be produced with a customized fiber bore and allow to build up hybrid connectors with many fiber types.

www.rosenberger.com/ok/opdi

Optical #16 Contacts

Butt joint contacts #16 fit into standard cavities of connectors according to MIL-DTL-38999.

www.rosenberger.com/ok/op16

Expanded Beam Contacts #12

Less susceptible for contamination, the expanded beam technology is designed for applications in harsh environments. These contacts fit into standard cavities #12 of MIL-DTL-38999 connectors.

www.rosenberger.com/ok/ex12

Rosenberger Duplex Connector (RDC)

Based on components of the N type coaxial connector, the RDC is the ideal connector for outdoor applications with 2 fibers. The optional APC technology allows singlemode interconnections with high return loss.

www.rosenberger.com/ok/rdc

Rosenberger Quad Connector (RQC)

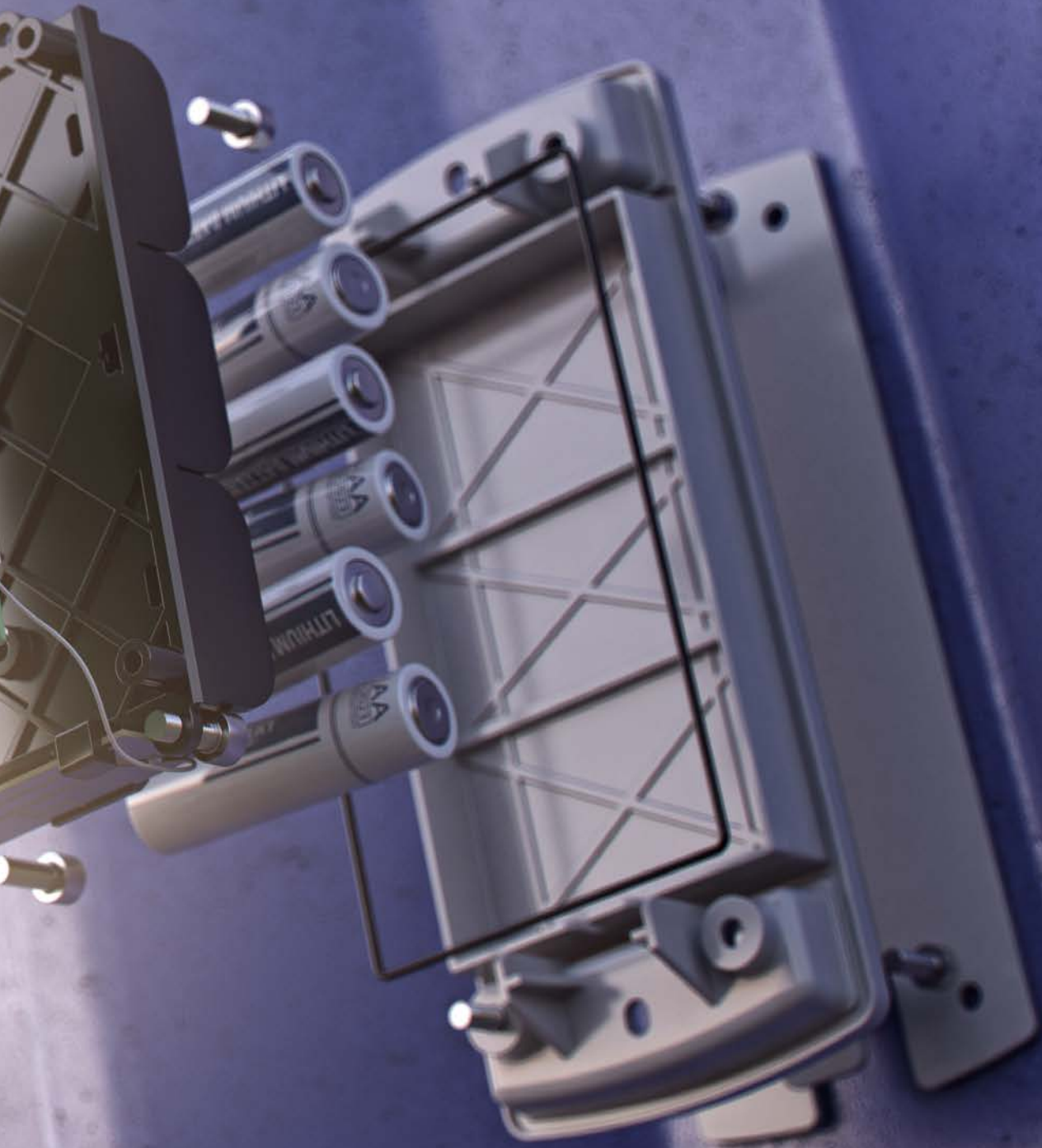
With the same dimensions like the RDC, the RQC connector is designed for applications with 4 fibers in harsh environment. A high return loss version with APC polished ferrules is optional.

www.rosenberger.com/ok/rqc



FAST COMMUNICATION. EFFICIENT AUTOMATION.

Business processes run efficiently
with a greater degree of automation.





MACHINE TO MACHINE SOLUTIONS

Reliable communication systems have become a part of our daily life. As the leading manufacturer of connectivity solutions with the necessary infrastructure Rosenberg offers a comprehensive range of products, services and the know-how required to meet the continually increasing demands in terms of quality, efficiency and cost-effectiveness.

M2M Technologies

Even today, there are many application areas in which companies can use M2M technology. On the basis of this technology, business processes can be set up with a greater degree of automation and run more efficiently. In the coming years, M2M will establish itself as one of the key technologies in many commercial segments and industrial branches.

Benefits:

- Enables the implementation of new business models, solutions and services
- Automated solutions for efficient and productive company processes that reduce costs
- Offers a wide spectrum of optimization potential and secures competitive advantages

M2M – technical basis for the "Internet of Things"

The M2M infrastructure is used by IoT (Internet of Things) to merge data from many different sources via one uniform user platform.

Internet of Things – M2M doing its everyday work

Devices, machines and everyday objects are outfitted with sensors or intelligent systems and communicate over the Internet. The Internet of Things is more than the mere interaction with the objects. Even static non-intelligent/non-networked objects can be introduced into the IoT by adding M2M hardware.

In the case of IoT, the individual human is the main focus – the technology should make the lives of people simpler and more comfortable. The uses of IoT range from energy usage measurement, building management and networked vehicle traffic up to health care provision and intelligent factory automation.

In order to master the digital transformation, we are constantly evaluating the newly emerging technologies. By collaborating, we also determine how the intensified networking of objects can profit your enterprise and indicate user-specific recommendations for action. However, M2M, on the other hand, is defined as a technology with the goal of automating and optimizing processes. Included in this are the transmission and communication of protocols between various application areas.

Our M2M competence – expert knowledge from one single source

As an M2M solution provider, Rosenberger offers the complete product and service spectrum for individualized implementation of your M2M project.

Rosenberger and CE+



Rosenberger has been engaged in the field of telematics as well as in M2M communication since 2011. To be able to provide customers with complete systems consisting of both hardware and software, Rosenberger has taken shares in the telematic company CE+, located in Timelkam, Austria.

Rosenberger mainly contributes its design, engineering, manufacturing and sales activities around the globe to the partnership. CE+ is already well-established in the market with a number of successful telematics projects and contributes its fully-developed software and service platform.

CE+ and Rosenberger together act as a system supplier, to provide specific solutions to customers from a single source.

About CE+

CE+ (www.ceplus.com), established in 2008, has focused, up to now, on the design and development of an industry-specific service platform for its autonomous telematics system. This enables positioning, tracking and sensing of various objects, e.g. vehicles, machines or containers.

AUTARKIC TRACKING UNIT

TINO® basic – Positioning & Tracking Unit – is a battery-operated system for determining location by means of GPS and transmission of the position data to a portal via GSM/GPRS. Due to its energy self-sufficiency, this system is ideal for object localization in situations in which a power supply is either impossible or not desirable.

Product Features:

- GPS receiver
- GSM/GPRS modem
- Motion detector
- Standard battery cells
- 1400 messages per battery set
- Protection IP 65
- Temperature range -20° C to +60° C
- Customer specific configuration with time and motion dependent operation scheme

Benefits:

- No external energy supply necessary
- Ruggedized design
- Metal protective cover available
- Mounting plate for easy installation

Applications:

Asset tracking for:

- Containers for solid and liquid goods for road and rail
- Cable rolls
- Small and large construction machinery



TINO® basic

Autarkic positioning and tracking unit.
www.rosenberger.com/m2m/tino

ONBOARD UNIT

PILOT GPS 3500 flex – is designed for continuous or temporary use in any vehicle fitted with cigarette lighter plug. Tracking and Tracing starts automatically after the vehicle moves. A very precise driving route as well as speed information will be provided. The device is primarily used for sub-contractors, for monitoring and fully automated billing of operating times and routes. The large battery allows data logging even without connecting it to the vehicle's power supply.

Product Features:

- GPS/GLONASS receiver
- GSM/GPRS modem
- Motion detector
- LiPo 1800 mAh battery
- Protection IP 67
- Operating temperature range -25° C to +55° C
- Customer specific configuration with time and motion dependent operating scheme

Benefits:

- No installation needed – plug & play
- High protection class
- Large battery capacity
- Wide field of use

Applications:

Tracking and tracing for:

- Cars, Pickups, Vans, Trucks
- Any vehicle with cigarette lighter plug



PILOT GPS 3500 flex

Tracking and tracing unit for use in any vehicle with cigarette lighter plug.
www.rosenberger.com/m2m/pilot

USER FRONTEND

CE+ Commander is the central user frontend and software package, which provides the customer an overview of all vehicles and assets in real time on one screen. CE+ Commander offers an extensive authorization system, alert management system, reporting system as well as a professional export function to ERP-systems. A "light version" of the CE+ Commander is available for Android smartphones.

Product Features:

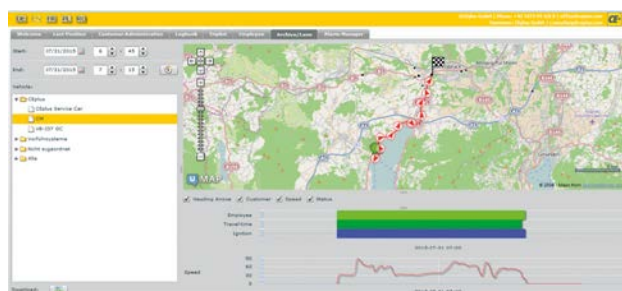
- Very user-friendly interface
- Modular architecture
- Show different kinds of vehicles, assets, etc. on ONE screen
- Multi-user capable
- Extensive authorization system

Benefits:

- Only one single frontend for all industry solutions (e.g. winter maintenance services, agriculture, forestry, equipment rental)
- Real time information
- Vehicle- and asset theft protection system
- Web-based platform

Applications:

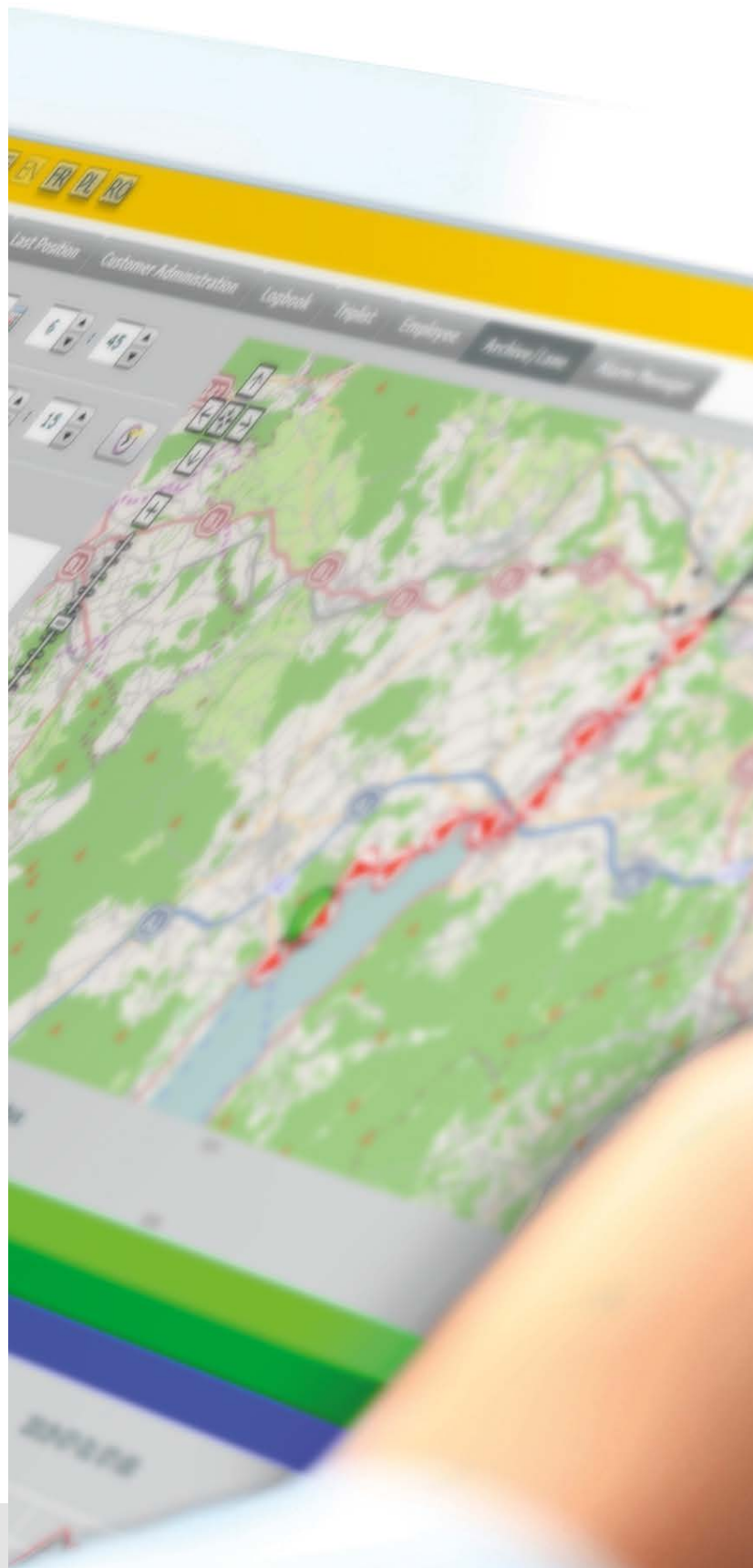
Software platform for asset tracking in real time



CE+ Commander

Centralize all used industry solutions in one web-based platform.

www.rosenberger.com/m2m/commander



IT'S ALL ABOUT THE SMALL THINGS.

Innovative magnetic interface made
by Rosenberger used in Vorwerk
Thermomix TM5.





TEAM. WORK.

Our expert staff is available to assist you at all times. Whether by phone or email: We will help you in solving your challenges.





**VICE PRESIDENT
BUSINESS AREA MEDICAL & INDUSTRIES
FOLKE MICHELMANN**

Phone +49 (0)8684 18-0
folke.michelmann@rosenberger.de

**DIRECTOR PRODUCT MANAGEMENT
MATTHIAS RAPPL**

Phone +49 (0)8684 18-1751
matthias.rappl@rosenberger.de

**SALES DIRECTOR MEDICAL
GÜNTER GLATZ**

Phone +49 (0)89 61 41 73 12
guenter.glatz@rosenberger.de

**SALES DIRECTOR INDUSTRIAL
JÜRGEN WENGLER**

Phone +49 (0)8684 18-1279
juergen.wengler@rosenberger.de

**SALES DIRECTOR AMERICAS
BRETT PHILIP**

Phone +1 707.536.9557
bphilip@rosenbergerna.com

CUSTOMER SERVICES

Phone +49 (0)8684 18-0
info@rosenberger.de



Medical & Industries Website

Refer to our website for further information:
www.rosenberger.com/m&i

Rosenberger

Hochfrequenztechnik GmbH & Co. KG

Hauptstraße 1 | 83413 Fridolfing

P.O. Box 1260 | 84526 Tittmoning

Germany

Phone +49 (0)8684 18-0

info@rosenberger.de

www.rosenberger.com

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