Committed to excellence

EFFICIENT. ROBUST. SCALABLE.
Consult – Know-how. Built-in.
The technical competence from Rutronik
Worldwide and individual consulting on the spot: by competent sales staff, application engineers and product specialists.

The product portfolio from Rutronik
Wide product range of semiconductors, passive and electromechanical components, storage, displays & boards and wireless technologies for optimum coverage of your needs.

The delivery service from Rutronik
Innovative and flexible solutions: from supply chain management to individual logistics systems.

Quality management without compromise
The integrated management system (IMS) encompasses quality control, environmental protection and occupational health and safety.

Our Product Portfolio

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semiconductors</td>
<td>Displays &amp; Boards</td>
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<tr>
<td>Passive Components</td>
<td>Storage Technologies</td>
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<tr>
<td>Electromechanical Components</td>
<td>Wireless Technologies</td>
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<td>Displays &amp; Boards</td>
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The Markets are Changing
Changing markets demand new solutions. Many markets are saturated, and products are being ever more replaceable and increasingly offering similar functionality thanks to growing standardization. Technological, regulatory and economic challenges along with growing functional complexity are a reality of numerous market segments, particularly for the industrial, automation, automotive and white goods (electronic household appliances for private and commercial use) segments.

Trends in High-Performance Electronics
In addition to the trends in the market segments, there are also developments that are affecting the entire high-performance electronics sector. The most important of these developments are “digital power” also with the related topics of “functional safety” and “robustness”. These have direct effects on operating conditions, technology and manufacturing methods.

Digital Power
One “power future trend” is that of “digital power”, also referred to as “intelligent digital power”. In electrical engineering, this buzzword refers to digitally controlled or monitored power supply units. In conventional switched-mode power supply units, an analog switch controls and monitors the output voltage. In digital power supply units, a microcontroller or DSP handles one or several of these functions. The control process is integrated into the controller at software level. One of the major advantages of digitally-controlled switched power supply units over analog solutions is the option of being able to intervene in the control process at any time and to adapt it to the current needs of the power supply. While this increases the level of effectiveness of the digital PSU compared to an analog variant, this does also increase the amount of technical development work required, which is reflected in the costs. Digital technology aims to satisfy the needs of the now ever more complex power supply systems.

Functional Safety and Robustness
Innovations that do not take safety into account cannot endure, which is why high functional safety and robustness are essential. In a robustness validation, for example, the reliability of electronic components is assessed by comparing the specific product requirements against the actual service life, taking into account the increase in efficiency. The fundamental concept behind functional safety is the strategy for reducing actual risks. The goal is to create a safe system in that every reasonable measure has been taken to avoid damage to property and danger to people, ensuring traditional safety measures.

Effects
These trends cover many industries and are directly related to operating conditions, technologies and manufacturing processes. In other words, changes to operating conditions or other techniques or manufacturing processes will also mean the involvement of different requirements imposed upon the installed components. This can be more clearly illustrated in the example of energy storage. If the conditions in which a battery is operated or if new technologies or manufacturing processes are implemented, this gives rise to new requirements imposed upon the charging strategy or the battery management system.

The operating parameters are of critical importance to the service life of an energy storage facility within an application. While developers often have no influence on the operating conditions, there is scope for optimization in the battery management system, although this scope is often used inadequately. As a result, operating conditions are changed without implementing the battery management system accordingly. In this connection, the most frequent recorded electrical failures are due to defective or discharged starter batteries. Specifically in the automotive industry, such battery failures were mainly found in luxury vehicles until the year 2000. The main cause was the growth in electronic component use and other electricity consumers in the vehicles, because even in a parked vehicle, the starter battery is constantly being discharged by the monitoring and control electronics. While the currents involved here – referred to as “standby currents” – are low, the battery can suffer from deep discharge if left dormant for long periods of time. For manufacturers, this raises the question of whether this know-how needs to be developed internally or whether the market might offer a suitable solution.
The Answer – RUTRONIK POWER

RUTRONIK POWER is much more than a complete portfolio of power components for various voltage classes and different applications. RUTRONIK POWER also offers a selection of components for a variety of applications suitable for the respective circuit. This means that under every position in the block diagram, there are products from multiple selected suppliers in the respective product segments. RUTRONIK accommodates as broad a range of requirements as possible here – whether low-cost or high-performance. For example, for a motor control circuit in the power range of 2KW, RUTRONIK offers appropriately designed IGBT modules, gate drivers as well as microcontrollers, driver modules, heatsinks and plug connectors.

For power semiconductors, RUTRONIK caters for everything today, from discrete to high-integration components, power ICs and power modules. As a broadline distributor, RUTRONIK offers all other components in addition to its power semiconductors, not only active but also electromechanical and passive components. The spectrum ranges from simple plug connectors to supercaps. This covers around 98% of the PCB. This also applies to other product segments such as high-current connectors supporting up to 1,000A and supercaps supporting up to 3,400 farad/cell.

But RUTRONIK POWER is much more than a broad selection of components. The decisive difference lies in RUTRONIK compiling relevant expertise, not only for individual products and technologies, but also on their compatibility with one another. This helps to guarantee extensive support – with development at application level by professionally qualified Field Application Engineers (FAEs), Product Managers at component level and supply at the end of a product lifecycle lasting several years. FAEs are particularly important for technical customer support. RUTRONIK’s experts advise and support activities ranging from the design-in process, the product evaluation and application development, the strategic marketing of product groups for which theoretical assistance is necessary, down to the development of logistics solutions with comprehensive system solutions that are optimized to the customer’s needs. RUTRONIK POWER focuses less on individual components and more on the overall solution.

RUTRONIK gives absolute priority not only to reducing the prevailing complexity of the offer-range but also to providing support at the product development stage at application level with relevant technical expertise and vertical system solutions based on suitable components.

The Advantages

RUTRONIK POWER serves as a single source for all components, from individual components to a basis for operational applications. But RUTRONIK POWER does not compete with its customers with its own components and applications, because the extensive range is combined into complete, vertically integrated system solutions. The product portfolio consists of decided manufacturers who are leaders in their respective fields and with some of whom the company has worked for decades. This ensures an extensive and consistent transfer of knowledge from the very start, both between the supplier and Rutronik as well as a collective exchange of expertise with the customer, for example concerning seminars, webinars and professional conferences.

The bundling of expertise and experience in the RUTRONIK POWER team guarantees that the customer receives extensive advice in respect of the overall application, the market and its requirements. RUTRONIK’s experts have a profound understanding of all relevant factors, with specialists from a variety of fields supporting each other, enabling the benefit of synergies across teams to be utilized more effectively, because market segments overlap in numerous aspects – and customers benefit from such coordinated consulting. This understanding of not only the customer’s requirements but also the technical options and the market conditions enables a precisely tailored solution to be developed – not off the shelf, but customized specifically to the customer’s needs. The RUTRONIK POWER team consists of specialists from the active power semiconductors, passive, electromechanical and embedded segments, utilizing the company’s extensive product portfolio.

ACTIVE
- Power Semiconductors

PASSIVE
- Resistors
- Inductivities
- Capacitors

EMECH
- Connectors & Cables
- Relays, batteries, fuses, switches, heat management

EMBEDDED
- Power Supplies

Working with the customer and with its suppliers, RUTRONIK develops forward-looking approaches, thereby contributing to research and development at application level. This is why RUTRONIK provides tools for certified applications that stand out not only with their extraordinary functionality, quality and robustness but also with their energy efficiency.

And this is exactly what RUTRONIK POWER is there for.
Industrial Application – Frequency Inverter

**Legend**
- Application: up to 5 KW

Active Components:
- Rectifier (Bridge)
- AC/DC PWM/FPC Controller
- MOSFet
- Rectifier
- IGBT Module (Brake Chopper)
- Diode
- IGBT
- MOSFet
- Sensor
- Hall Switch
- Magnetic Position Sensor
- Microcontroller
- DC/DC Converter Module
- DC/DC Switching Converter
- Diode
- LDO
- MOSFet
- Rectifier
- Gate Driver
- Gate Driver (Isolated)
- Motor Control IC
- AC/DC Converter Module
- Diode (Protection)
- Diode (Schottky)
- IGBT Module
- IPM
- TIM
- IGBT

Passive Components:
- Inductor
- Power Transformer
- Resistor
- Current Transformer
- Capacitor (Foil)
- Varistor
- Capacitor (Foil)
- Resistor (wire-wound)
- Resistor (liquid-cooled)
- Resistor (wire-wound)
- Filter
- Capacitor (Foil)
- Capacitor (Electrolyte)
- Inductor
- Capacitor (Electrolyte)
- Capacitor (Foil)
- Resistor

E-Mech Components:
- Amphenol FCI
- ASSMANN WSW
- JAE
- Littelfuse
- Omron

Embedded Components:
- Power Supply
Home Appliance Application – Induction Hob

Legend
Application: up to 2 KW per hob

Active

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E-Mech

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Passive

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Embedded

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Legend

- Fuse
- Power SW
- Inverter Heater
- Cool Fan
- Isolated IGBT/Mosfet Driver
- Air Circulation Fan
- Opto coupler
- MCU
- Cooling Vessel
- Inverter Control
- Temperature Control
- Roast Control
- Radiant Heater Control
- Fan Control
- LED’s
- Internal Light
- Encoder
- Key Entry
- Timer

- AC/DC
- DC/DC
- DC
- Triac
- LED
- IPD
- DC 12V
- MCU
- Inverter Control
- Temperature Control
- Roast Control
- Radiant Heater Control
- Fan Control
- LED’s
- Internal Light
- Encoder
- Key Entry
- Timer

- Active Components
- Passive Components
- Embedded Components

- Diodes
- Resistors
- Capacitors
- Inductors
- Microelectronics
- Relay
- Switch
- Fuses
- Heatsink
- Relays
Specifications subject to change without notice. Please note, there could be some limitations for some franchised product lines in several countries. For more information, please contact our sales team.