More than 3,000 customers rely on SCHLEIFRING solutions. Our customers are specialists in complex technical products in aerospace, energy industry and automation markets as well as the medical sector. In virtually all high-tech industries our solutions successfully provide the rotating interface behind the process. The outstanding quality of our precision products in medical technology is proven and our products lead the field in space surveillance. We maintain a global network of sales and service establishments so that we can be close to our customers in over fifty countries throughout the world.

SCHLEIFRING offers a wide range of rotary joints exclusively for industrial applications, ranging from standard designs for simple tasks to highly complex customer-specific systems often involving several hundred rings. These slip rings and rotary joints facilitate the supply of power and the transmission of electrical signals, all common data bus signals, Gigabit Ethernet to optical signals as well as media from stationary to rotating elements.
Contactless Transmission | Capacitive Data Link GigaCAP®

The application of industrial standard protocols is in high demand. Communication standards such as Gigabit Ethernet or Fiber Channel are supported and allow for data rates up to 10 Gbit/s. Thus, the system integration of the data channels is simplified as components from the IT marketplace can be used. The modular design allows the system to be quickly and easily adapted to customer-specific applications.

Features:
- Multiple stackable channels
- Unidirectional or bidirectional
- Max. diameter: 2,000 mm
- Height: 25 mm/1” per stack plus housing
- Shapes: two circuit boards for 2 channels in a metal housing
- Rotational speed: only limited by mechanical restrictions

Wear-resistant, high noise immunity combined with excellent EMC qualities, high reliability and bit error rates of < 10⁻¹².

Classic applications
- Automation, industrial scanners
- Customer-specific applications
- Radar, periscopes

Contactless Transmission | Inductive Power

In addition to contacting slip rings, contactless rotary joints are becoming more and more popular.

SCHLEIFRING’s worldwide-patented technology for inductive, contactless power transmission allows voltages of 24 V up to 400 V within a range of 1 W to 10 kW. Especially in applications with high rotational speeds, our contactless slip rings ensure a long, wear-free service life, which cannot be achieved with a contacting transmission system.

This new compact hybrid unit combines contactless power and signal transmission, allowing temperature monitoring of rollers in foil processing machines for instance. Contactless power and signal transmission provides a wide range of options for industrial innovations.

Classic applications
- Cleanroom applications
- Vacuum technology
- Semiconductor industry
- Printing machines
- Balancing machines
- Pick and place machines
- Packaging lines
- Plastic processing machines
- Bottling machines
Our slip rings provide the dynamic electrical connection between static and rotating mechanical elements. They operate as rotary interfaces continually transferring electrical power in any direction.

Slip rings are produced in various types and sizes depending on:
- Electrical requirements
- Mechanical property requirements
- Operating environment
- Customer needs

From low to high power
SCHLEIFRING’s silver braid brushes or silver-graphite brushes on silver rings as well as the gold wire technology provide for optimum power transmission. Depending on the technical requirements, they allow excellent transmission of low power up to and above 1,000 A at high rotational speeds and with a long service life.

Sensitive data and digital signals e.g. piezoelectric or strain gauge signals
SCHLEIFRING’s gold wire technology and the contact configuration of silver-graphite brushes on brass rings allow for excellent signal and data transmission:
- Extremely low electrical noise and contact resistance
- Long, low-maintenance service life
- High contact reliability
- Crosstalk isolation
- Reliable operation under shock, vibration and extreme temperatures
- Transmission of all common bus systems
SCHLEIFRING offers sophisticated solutions for the transmission of fluids such as water, oil and coolants, as well as gas and air – optimized to the customer’s application. Media rotary joints integrated within slip ring assemblies are also available as complete rotary joint units consisting of media slip rings, optical rotary joints, encoders and/or microwave rotary joints.

No matter whether our customer needs specific solutions for high pressures, high speeds or high flow rates – SCHLEIFRING provides the highest quality systems for optimum service lives.

Optical fibers transmit high data rates reliably over long distances. SCHLEIFRING offers fiber-optic rotary joints to provide a direct link to optical fibers. FORJs transmit any kind of digital or analogue optical signals regardless of the data protocol.

Highlights:
- Data rates of 10 Gbit/s or higher
- Not affected by EMI
- Temperature range: -40 °C to 85 °C
- Up to a capacity of 32 fibers

Classic applications:
- Ground and marine radar systems
- Offshore industry
- Unmanned aerial vehicles (UAV)
- Mining industry
Compact design
Even at high rotational speeds resilient miniature slip rings are the ideal solution for signal transmission wherever space is tight and/or weight is a limiting factor. These slip rings require no maintenance during their nominal service life.

Free inner bore
Specific applications require slip rings with a large free inner bore. SCHLEIFRING designs meet these high demands, offering free inner bores ranging from 6 mm up to 2,000 mm.

Explosion-proof
• Units for Ex Zones 1 and 2 with Ex p and Ex d certification
• Enclosures in marine grade stainless steel certified by ABS, DNV, BV or Lloyds

Specific Housings

Constantly and rapidly changing demands call upon SCHLEIFRING’s traditional design engineering expertise, unique technical knowledge and exact manufacturing standards.

The market share achieved so far has allowed SCHLEIFRING to make investments in new state-of-the-art design tools, such as the Solid Edge® computer-aided design (CAD) system, as well to employ more than 50 design engineers.

Specific Housings

Cylindrical housings
• Aluminum, coated steel or stainless steel
• Material durability tested even in very aggressive environments
Our wide service is made up of a team of highly qualified service engineers. Systematic support and maintenance by our experts solves potential problems before they arise.

We support our clients throughout the entire service life of the product right up to its disposal.

High quality standards, secured by our quality management system, deliver our customers with first class products.

Every employee is trained in due consideration of the SCHLEIFRING quality philosophy. The current state of DIN EN ISO 9001:2008 is continuously controlled and yearly inspected by TÜV Süd.

We support our clients throughout the entire operating life of the product right through to its disposal.
Proficient technical support and maintenance over the entire service life ensure that your slip rings always run on state-of-the-art technology.

We constantly monitor all necessary processes and provide maintenance and support according to MIL-standards.

Of course, our service engineers have the necessary training for the job, having, for example, offshore certification to BOSIET, HUET and EBS, allowing them to reach remote sites by helicopter.

SCHLEIFRING attaches great importance to the responsible use of natural resources, environmental protection and targeted environmental management as key prerequisites for sustainable development.

Quality, delivery and cost efficiency drives our process in production as well as after-sales.

Documenting precise documentation of all important development steps, control of all documents and certificates, as well as manuals for installation and maintenance to guarantee trouble-free lifetime.
Hybrid Units

Slip ring systems combining a multitude of transmission technologies

Our products’ range of applications covers standard designs for simple tasks up to highly complex customer-specific systems often involving several hundred rings. Hybrid slip ring units combine various transmission technologies to transmit electrical power, signals, bus data, RF signals and media in one system. Because of the great variety of demands made upon the slip ring assembly, it is imperative that the system designers give thought to the space available and performance expected early in the design stage.

The product shown contains:

- Power up to 15,000 V/700 A carbon/silver technology
- Signal and data (bus, video): gold/gold technology
- Radio frequency DC rotary joints up to 94 GHz
- Encoder
- Fiber-optic rotary joint
- Contactless data link up to 10 Gbit/s: GigaCAP®
- Media rotary joints for hydraulic, pneumatic, cooling/heating media, gas up to 2,000 L/min

A cross section of this product cross section is shown on the next page!
Requirements for industrial applications with regard to service life and data transmission rates (e.g. Fast / Gigabit Ethernet, Profinet) are higher than ever before.

For this reason SCHLEIFRING offers the ideal solution: contactless power and data transmission.

Without the general use of brushes running on metallic surfaces this system is almost maintenance-free at continuously high rotational speeds.

**Functionality:**
The power is transmitted inductively from the stator to the rotor by a rotationally symmetric transformer. The resulting efficiency is over 95%, meaning that the heat development is less than 5%.

Currently, slip ring systems from 1 W to 10 kW are used for industrial applications; for medical applications, systems up to 200 kW are used.

Data transmission occurs capacitively in the near field.

**Advantages:**
External interference fields have no influence on bit error rates < $10^{-12}$ at data rates of up to 10 Gbit/s per channel (in parallel circuits > 40 Gbit/s).
SCHLEIFRING developed this compact and reliable PCB technology in close cooperation with the robotics and material handling industry as well as for pick and place machines. Slip rings in this product group allow for the reliable transmission of electrical power, signals and all common bus system data in various demanding applications.

**Modular systems**
- Module and brush block integrated into customer-specific designs
- Systems with bearings
- Self-contained systems with aluminum housings
- GigaCAP® CAN bus

**Special characteristics:**
- Compact design
- High contact reliability due to multi-contact brushes
- Good cross talk isolation and low electrical noise
- Virtually wear-free with a long service life

**Self-contained & Capsuled Systems | Bottling Machines**

Systems for the pharmaceutical and food processing industries

Designed especially for industrial control equipment in the pharmaceutical, chemical and food processing industries, SCHLEIFRING offers self-contained capsule slip ring solutions with stainless steel housings. All versions are resistant to water and dust ingress (industrial protection class IP65 according to EN 60529) and designed to operate at temperatures up to +70 °C.

The gold wire technology guarantees excellent results with regard to the transmission of power, data and common bus signals such as Profibus and Fast Ethernet. The electrical slip ring is optionally available with a media rotary joint.

The requirements on the slip ring systems are as varied as the applications in the pharmaceutical and food processing industries themselves.

SCHLEIFRING’s silver braided brush contact configuration guarantees the best signal transmission results even at high rotational speeds.

**Compact PCB Slip Rings | Pick & Place Machines**

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SCHLEIFRING is the global market leader for sophisticated rotary joints and slip ring systems for CT scanners. These rotary joints with free inner diameters of up to 2,000 mm permit the supply of power to the X-ray tube, the transmission of all bus system data as well as the contactless transmission of digital image data up to 10 Gbit/s per transmission link.

The state-of-the-art manufacturing process includes research and development, the design and production of transmitter and receiver electronics, the relevant plastic casting and machining technology as well as demanding mechanical production processes ranging from microtechnology up to 5-axis HSC milling of diameters up to 2 meters.

Transmission of high currents for operating tools, transmission of sensor data for electronic position controls, integrated encoder systems, compact and robust design – these are the most important characteristics of a slip ring for use in machine tools. Depending on the application, either gold-on-gold contacting slip rings or hybrid solutions with graphite brushes can be used for power transmission.

The slip ring is individually customized according to the ever-increasing customer requirements and the need for high protection class ratings.

Slip ring systems for
- CT scanners
- Contacting power and control data transmission
- Contactless high data rate transmission
- Integrated encoder
- Gantry systems for medical technology
Industrial Applications

Renewable Energy | **Pitch Control Slip Rings For Wind Turbines**

SCHLEIFRING’s pitch control slip rings provide reliable power, signal and data transmission under the harshest environmental conditions. Giant rotor blades make the most effective use of the wind's energy onshore and offshore. They supply millions of people with clean energy.

The world's most successful OEMs and operators trust that SCHLEIFRING makes the most reliable and safest pitch control slip rings available. We help them to reduce operational costs, thus making wind energy cheaper and even more competitive.

SCHLEIFRING’s pitch control slip rings are tailor-made designs for electrical and hydraulic pitch systems. They are a vital component for the overall system, ensuring that the turbine is under control at all times. They are, of course, combinable with each of the above-mentioned transmission technologies.

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Industrial Applications

**High-voltage slip ring systems**

Optical, electrical and swivel signal slip rings are elements of a swivel stack system used for deepwater oil and gas production. They transmit power for oil pumps and valves located on the seabed as well as data for control systems.

Designed for extreme environmental conditions and long service lives.

The complete swivels are tested up to IP68, certified to Ex d or Ex p and verified by BV, DNV, Lloyd’s or ABS.

**Ex-proof fiber-optic rotary joints**

A compact 4 to 32 channel fiber-optic rotary joint for single fibers in an Ex d certified stainless steel housing allows the transmission of electrical signals and data bus signals even under highly exacting use in offshore applications. The technical features – passive, bidirectional and unaffected by EMI, EMP and ESD – allow for the transfer of data rates relative to the data fed into the system. An integrated connector box enables customized reinforced cables to be accessed and fiber-optic rotary joints to be connected via FC/SC connectors.

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Underwater Applications | **Naval & Offshore Systems**

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