



ENERGY /
PROCESS INDUSTRIES /
TRANSPORTATION

SIGNAL & POWER SLIP RINGS





MERSEN, YOUR SOLUTION PROVIDER

Mersen offers 4 unique technologies that can be combined for reliable and high quality signal & power slip rings.

APQP **4** Wind

FINE-TUNED SOLUTIONS MEETING CUSTOMERS' EXPECTATIONS

- The majority of our products are plug & play
- High-quality materials, precision bearings, robust housings, and state-of-the-art electronics are some of the components that make up a quality transmission system
- With focus on the standard transmission of different currents and signals, Mersen's electrical slip rings can also be fine-tuned to deal with the specific demands of today's equipment
- Our rotary joints are designed and manufactured in compliance with international standards such as DIN, IEC, UL, CSA and others
- Our extensive laboratory testing capabilities and our partnership with external laboratories and universities also enable us to test them according to customers' specifications (IP protection, shock and vibration, service life time, humidity, etc...)



WHY MERSEN?

- Unlike other manufacturers, all of Mersen's electrical slip ring assemblies are equipped with Mersen's state-of-the-art carbon brush grades. These customized brush grades have been developed and produced in-house, with over 130 years of advanced carbon material expertise

- Member of **APQP@Wind** showing our commitment to deliver the best quality products to the market

- Approved by major OEMs



Hittisau plant, Austria



Chemical laboratory



Climate chamber



Test bench for life testing

We strive for customer success and satisfaction with our optimized solutions!



SIGNAL & POWER TRANSFER SYSTEMS (SPTS)

Signal & power slip rings, also called electrical slip rings, pitch control slip rings or rotary joints, transmit signal, power and data between static and rotating parts. Successful equipment operation is dependent on these interfacing components running smoothly.

MERSEN OFFERS 4 RELIABLE TECHNOLOGIES:

| | | |
|--------------------|------------------|---|
| 01 CARBON BRUSH | 02 CAPACITIVE | <p>OUR SOLUTIONS ARE CAPABLE OF TRANSMITTING:</p> <ul style="list-style-type: none"> • Current from mA to kA • Signals from DC to 0Hz to Gbit |
| 03 FIBER OPTIC | 04 GOLD WIRE | |

These 4 technologies can be combined into hybrid systems, utilizing the technical advantages of each system to meet the requirements of almost any rotating application. We are also able to integrate other external mediums into our solutions, such as oil, water and air.

MERSEN SPTS FEATURE COMPARISON

| Type of transfer system | Max. rotation speed (rpm) | Current transfer | Signal transfer | Data transfer | Estimated life time (rotation) | Hollow shaft | Maintenance | Contactless | Remarks |
|-------------------------|---------------------------|------------------|-----------------|---------------|--------------------------------|--------------|-------------|-------------|--|
| CARBON BRUSH | 3,000 | Y | Y | < 10 MBIT | 100X10 ⁶ | Y | YES | N | EASY POWER TRANSFER, NEED MAINTENANCE TO REMOVE CARBON DUST / TO REPLACE BRUSHES |
| CAPACITIVE | 3,000 | Y | Y | < 1,000 Mbit | 200X10 ⁶ | Y | LOW | Y | LOW MAINTENANCE DUE TO NON-CONTACT TECHNOLOGY |
| FIBER OPTIC | 2,500 | N | Y | < 10,000 Mbit | 200X10 ⁶ | N | LOW | Y | LOW MAINTENANCE DUE TO NON-CONTACT TECHNOLOGY, SENSITIVE AGAINST VIBRATION, PERIPHERAL DEVICES (MULTIPLEXER) NECESSARY |
| GOLD WIRE | 50 | Y | Y | < 10 Mbit | 80X10 ⁶ | Y | YES | N | NEED MAINTENANCE TO LUBRICATE THE WIRES ONCE A YEAR / NOT RECOMMENDED WHEN HARD SHOCKS OR VIBRATIONS OCCUR |

Layouts Tailored to Your Needs with Adapted Design Options:

- Special seals for IP protection
- Special surface treatments
- Angular encoders, resolvers, or incremental encoders
- Medium feedthroughs
- Temperature sensors
- Plug & play connectors or contact clamps
- Direct connections to the circuit boards
- Self regulated integrated heaters



01 CARBON BRUSH SYSTEMS

YOUR BENEFITS

- Cost-efficient
- Mersen manufactured and field-proven premium carbon brushes and material combinations
- Resistance to harsh environmental conditions
- Long lifetime
- Easy adaptation to different slip ring diameters ("hollow shaft")
- Low and easy maintenance
- Speed from standstill up to 3,000 rpm (depending on slip ring diameter)



SIGNAL TRANSMISSION

Contact driven analog and digital signals

POWER TRANSMISSION

Special grades, from standstill to high rotational speeds

MAIN APPLICATIONS

Industry, wind turbines, material handling systems, cranes, etc...

+ HYBRID SYSTEMS

Hybrid systems are flexible solutions offering reliability in the transfer of both high frequency signals and high power.

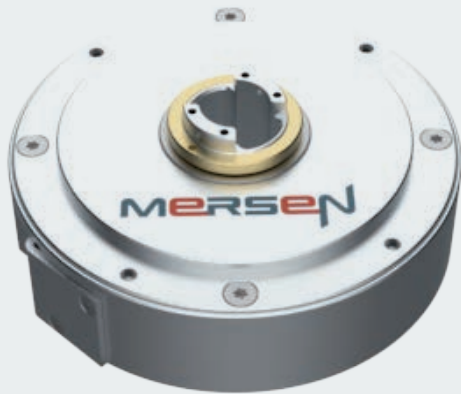


- Fine-tuned modular systems
- Combination of well established carbon brush systems for power transmission and maintenance free contactless systems for data transfer
- Low maintenance transfer
- Reduced TCO (Total Cost of Ownership)
- Long life time (100 million revolutions)
- Near field transmission (less electromagnetic impact)
- Very low bit error rate ($BER \leq 1 \times 10^{-12}$)
- Plug & Play system, no need for auxiliary interface electronics to adapt to standard industrial bus systems
- Possibility to have a hollow shaft configuration

02 CAPACITIVE SIGNAL TRANSMISSION SYSTEMS

YOUR BENEFITS

- Maintenance free
- Reduced TCO (Total Cost of Ownership)
- Non-contact: no wear (dust-free operation)
- Long life time (200 million revolutions)
- Near field transmission (low electromagnetic impact)
- Very low bit error rate ($BER \leq 1 \times 10^{-12}$)
- Plug & Play system, no need of auxiliary interface electronics to adapt to standard industrial bus systems
- Possibility to have a hollow shaft configuration
- Self diagnostic
- Speeds of up to 3000 rpm, or higher

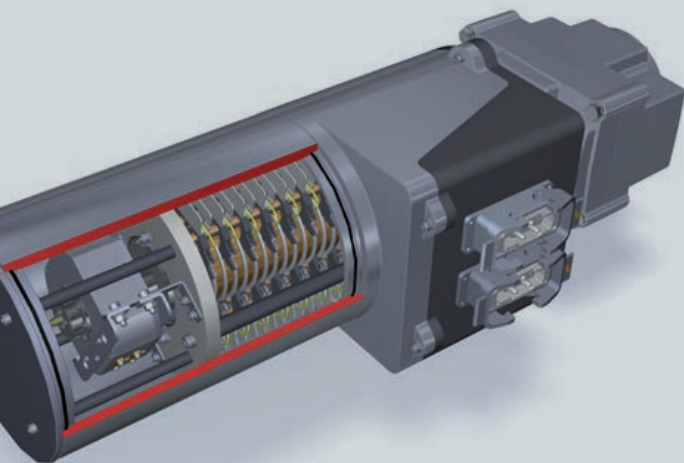


SIGNAL TRANSMISSION

High reliability of data transmission up to 1 Gbit. Able to transfer all standard protocols (CAN Bus, Ethernet, Profinet). Multichannel, possibility to combine different types of protocols (for example Ethernet with CAN)

MAIN APPLICATIONS

Wind turbines, food industry, machine tools, robotics, scientific equipment, medical, aerospace, military, energy, etc...



SIGNAL TRANSMISSION

Analog and digital signals (RS232 / RS422 / RS485 protocols)
CAN, Ethernet, Profibus

POWER TRANSMISSION

1 A to 200 A at voltages up to 690 V

MAIN APPLICATIONS

Industry, wind turbines, material handling systems, cranes, etc...

03 FIBER OPTIC SYSTEMS

YOUR BENEFITS

- Maintenance free
- High-speed data transfer
- Data transfer in Electro Magnetic Interference (EMI) sensitive environments
- Operate without an external power supply
- Speeds from 0 rpm to 3,500 rpm
- Compact designs
- Proven lifetime of 200 million revolutions for one channel and 100 million revolutions for multichannel

SIGNAL TRANSMISSION:

Very high frequencies (up to 10 Gbit)
Single or Multi-channel, single and multi-mode
up to 20 channels, more on demand

MAIN APPLICATIONS:

Those requiring very high data transmission rates and high reliability with many transmission channels (wind turbines, medical, military, industry, science, etc...)



04 GOLD WIRE SYSTEMS

YOUR BENEFITS

- Slip ring / wire contact system, both with noble metal coatings
- The pressure of each and every wire is individually calibrated to guarantee constant and uninterrupted contact with the slip ring track, allowing high quality signal to noise transmission
- Complete range from nickel/nickel contact systems to gold/gold contact systems for high-end requirements and high reliability, even in the harshest environments
- Low and easy maintenance with quick access (all wires are grouped together in individual retainers which are mounted on both sides of the slip rings)
- Speeds up to 50 rpm (depending on slip ring diameter)
- Possibility to have a hollow shaft configuration

SIGNAL TRANSMISSION::

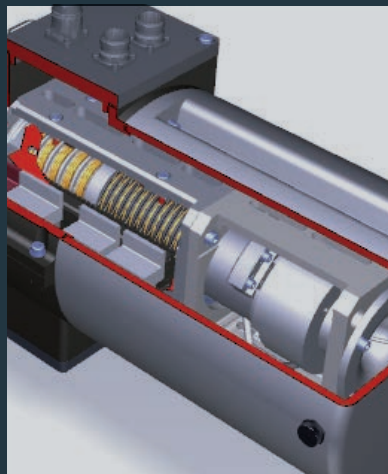
Analog and low level digital signals on request

POWER TRANSMISSION:

1 A to 150 A at voltages up to 690 V
(higher voltages on request)

MAIN APPLICATIONS:

Systems requiring high reliability and safety with long maintenance intervals such as wind turbines, material handling, ship propulsion, cranes, motion controls, surveillance cameras, etc...





PTT-SPTSEN2107 - Design by APHANIA - Photos : @ Photomeye | @ Hellen Sergeeva | @ Dechev | @ Yang Yui | @ VanderWolf Images | Dreamstime - @ Pxxcom | @ Dejan Krizanovic | @ Druic007 | @ Misad | @ Moreno Soppelsa | @ Arnaleski | @ Dylens | @ A J Cotton | @ Volodymyr Kyrylyuk | @ Moses1978 | @ Spinner | @ Patrizio Martorena | @ Waldemar Brandt | @ MarkGillow Dreamstime - @ mbolina | @ Aris Sanjaya | @ Gary / Fotolia - Photothèque Mersen



GLOBAL EXPERT IN ELECTRICAL
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