Slip rings & Rotary Joints general informations

Slip rings and Rotary joints enable signals and/or power to be transmitted from a fixed part (stator) to a mobile part (rotor).

The Electromechanical Solutions Strategic Business Unit at **EXXELIA** GROUP constantly endeavors to raise performance levels through innovation, and develops high-frequency contact Slip rings (>1 GHz), offering signal transmission capability for new video formats such as HD SDI and 3G SDI and Gigabit Ethernet.

Applications:
Aeronautics, Defense, Oil exploration, Medical, Space, Telecommunications

SLIP RINGS

Slip rings transmit information via electric contacts (brushes rubbing against tracks). For over 40 years, the CSA Business Unit at **EXXELIA** GROUP has developed a wide range of Slip rings available in different versions:

- standard interface,
- hollow shaft interface,
- pancake (monobloc rotor and stator without bearings, rotor guidance being left to the customer),
- rotor and stator sold separately.

EXXELIA GROUP Slip rings can be equipped with different type of position sensors made-in-house (optical encoders, magnetic encoders and precision potentiometric, etc.) to copy positions.

These products can be used in a wide range of applications, from robotic equipment to on-board equipment for civil and military aircraft electronics, armored vehicles, automatic weapon stations, radars, Electro Optronic Systems assemblies, space and exploration instruments used in the Oil and Gas sector.

Applications:
Aeronautics, Defense, Telecommunications, Space, Oil exploration.

EXXELIA GROUP offers a wide range of standard Slip rings. Most of these products are qualidfied and proven solutions in the field of defense, Aeronautics, Space, Railway, Medical, Oil exploration...

EXXELIA GROUP standard Slip rings can be divided in four categories:

- Compact standard Slip ring,
- Small standard Slip ring,
- Wide standard Slip ring,
- Very wide standard Slip ring.

HIGH FREQUENCY ROTARY JOINTS

EXXELIA GROUP also designs and manufactures High Frequency rotary joints (for frequencies > 1 GHz).

These rotary joints can be:

- Coaxial High frequency Rotary Joints.
- IFF Rotary Joint (Identification Friend / Foe).

STANDARD

Slip rings

COMPACT DIMENSION

External diameter = 20 mm.
Up to 125 channels.
Slip ring mainly designed for signal channels.
Possibility to have power channels up to 10 A.
HD-SDI / 3G-SDI compatible.
Ethernet up to 1000Base-T

Applications: Aeronautics, Defense (Electro Optical Systems), Telecommunications, Space...

SMALL DIMENSION

External diameter = 50 mm.
Up to 150 channels.
Slip ring designed for signal & power channels.
Qualified for the transmission of Gigabit Ethernet 1000Base-T.
Hollow shaft option (Ø int. 16 mm).
Possibility to integrate a Fiber Optical Rotary Joint (FORJ).

Applications: Aeronautics, Defense (Electro Optical Systems), Telecommunications, Space, ...

MEDIUM DIMENSION

External diameter = 100 mm.
Slip ring designed according to a modular design technology. Possibility to increase the number of channels without any additional length (very compact solution).

Concentric modules: possibility to integrate inside a small standard module with an Optical Fiber Optical Rotary Joint (FORJ) or a compact module.

Compatible HD-SDI and Gigabit Ethernet 1000Base-T.
Hollow shaft option (Ø int. 50 mm).
Slip ring can be equipped with an optical encoder, a magnetic encoder or a precision potentiometer, a rotary switch, etc.

Applications: Aeronautics, Defense (Electro Optical Systems), Telecommunications, Space, Medical, Transportation...

Slip rings

STANDARD

LARGE DIMENSION

External diameterup to 1200 mm.

Slip ring designed according to a modular design technology possibility to increase the number of channels without any additional length (solution very compact).

Slip ring can be equipped with an optical encoder, a magnetic encoder or a precision potentiometer, a rotary switch, ...

Applications: Aeronautic, Defense (Electro Optical Systems), Telecommunications, Space, Medical, Transportation...

HIGH POWER SLIP RINGS

EXXELIA GROUP designs and manufactures High Power Slip rings based on a long heritage list.

EXXELIA GROUP Slip ring handles high electrical power up to 2000 Amp. and up to 10 kV.

Depending on the application and the requested parameters like running torque, temperature and current, brushes may be made of carbon silver in precious metal alloy.

Applications: Defense (Radars, Turrets...), Naval (Sonar winch) and Industry.

SPECIFIC

Slip rings

SLIP RINGS FOR SPACE USE

EXXELIA GROUP is qualified on a very important number of flight applications (there are a lot of satellites equipped with **EXXELIA** GROUP Slip ring).

All the spatial Slip rings are bearingless to fit the customer's interface which provide weight saving.

They are manufactured in a clean room by respecting the state of the art of the space applications manufacturing.

Applications: SADM (Solar Array Drive Mechanism System) + Rotary actuators.

HOLLOW SHAFT SLIP RING

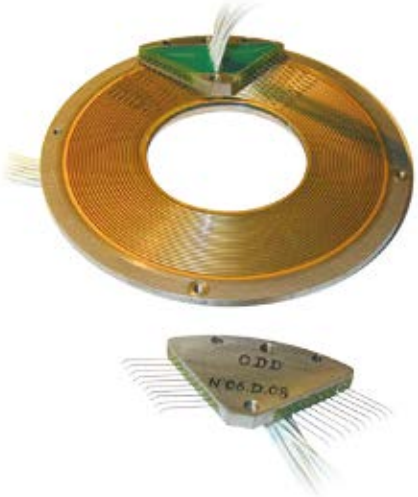
A Hollow Shaft Slip ring (sometimes called through bore) is a Slip ring with a bore through the centre of the slip ring module. The bore enables the slip ring to be mounted on a shaft, offering space for hydraulics, pneumatics (Rotary Union) or integration of an Fibber Optical Rotary Joint (FORJ)

Applications: Aeronautics, Defense (Electro Optical Systems), Telecommunications, Space, Medical, Transportation...

PANCAKE

A Pancake Slip ring is a Slip ring adapted to designs with limited vertical space and no bearing (alignment of the Rotor / Stator must be performed by the customer)..

Applications: Aeronautics, Defense (Electro Optical Systems), Telecommunications, Space, Medical, Transportation...



Slip rings

SPECIFIC

HIGH RPM

EXXELIA GROUP designs and manufactures High speed Slip rings based on a long and rich experience. This experience has been acquired by the development and the manufacturing of Slip Rings for helicopter test flight equipment. These types of Slip rings use a specific patented system called Multi fingers brushes. The advantage of the multi finger system is to limit the noise and the wear while providing high speed capabilities.

Features:
Speeds up to 6.000 rpm,
Signals, power, high data rates (Ethernet, HD SDI Video signals...),
Possibility to have Slip rings equipped with **EXXELIA** GROUP position sensors (Optical encoders, Magnetic Position sensors.

Applications: Aeronautical (Helicopters), Defense (Test benches for missiles), Industry...

HIGH TEMPERATURE/ HIGH PRESSURE

EXXELIA GROUP can propose Slip rings for the field of oil and Gas exploration. Oil & Gas exploration is a sector where the operating conditions are very severe. These harsh conditions can be easily supported without any problem by the **EXXELIA** GROUP Slip rings (High Temperature +200°C, High pressures 200 bars, shocks 100g).

Applications: Oil & gas exploration.

LARGE DENSITY CHANNELS

EXXELIA GROUP can propose Slip rings with any number of channels (> 400 channels) and whatever the application. Outputs can be with flying leads and / or with connectors which can be filtered by **EXXELIA** GROUP's filters.

Applications: Aeronautical, Defense, Industry...

STANDARD
ROTARY JOINTS

ROJO Series

COAXIAL HIGH FREQUENCY ROTARY JOINTS

EXXELIA GROUP designs and manufactures coaxial High Frequency rotary joints (for frequencies > 1 GHz).

These rotary joints use contact technology.

EXXELIA GROUP can propose coaxial rotary joints adapted in impedance 50Ω or 75Ω which allows to have a bandwidth > 3 GHz (DC / > 3 GHz).

The coaxial rotary joints 75Ω allows the transmission of video signals under the format 3G SDI (Norm SMPTE 424M).

Applications: Aeronautics, Defense (Electro Optical Systems), Telecommunications, Space, Medical, ...

L-BAND ROTARY JOINTS

EXXELIA GROUP designs and manufactures L-BAND High Frequency rotary joints for a bandwidth closed to 1 GHz.

These L-BAND High Frequency rotary joints use a contactless technology. They are multi-channels.

They can be integrated in a wide range of products and can be integrated inside the **EXXELIA** GROUP Slip rings.

One of their biggest interests is to be very compact and light compared to their bandwidth and their performances.

Applications: Aeronautics, Defense (Electro Optical Systems), Telecommunications, Space, Medical, Transportation...

Hybrid Systems

SPECIFIC

SERVO MOTORS

EXXELIA GROUP can design and manufacture very specific electrical motors equipped with its own position sensors (Optical encoder, Magnetic position sensors, precision potentiometers).

Most of these products are used on missiles for different applications: missile fin actuator or missile seeker.

Applications: Defense (seeker, actuator...), Industry...

SLIP RING + FORJ (Fiber Optical Rotary Joint)

When the flow of signals is high, or when the quantity of signals is very important (> 3 Gigabit/s), it can necessary to use optical signals.

EXXELIA GROUP Slip rings can be equipped with FORJ which allows transferring these optical signals (number of optical channels: from 1 up to more than 10 channels).

Applications: Defense (EOS, RCWS, Radar...), Industry...

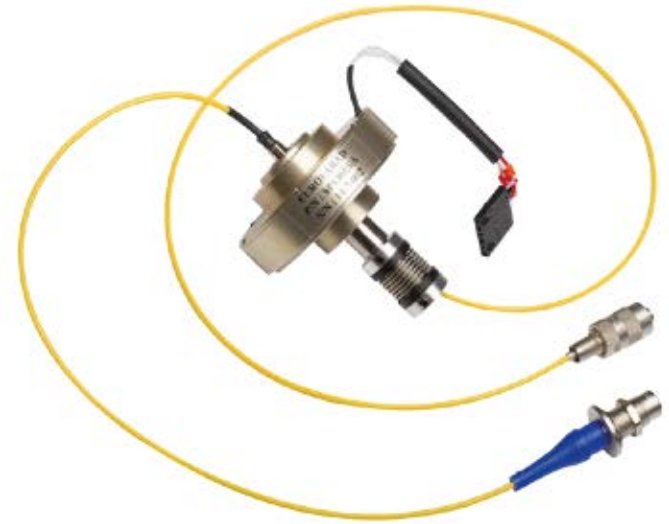
SPECIFIC

Hybrid Systems

ENCODER + FORJ

EXXELIA GROUP's position sensors can be equipped with FORJ (Fiber Optical Rotary Joint). This association allows simultaneously in a low volume the use of a transfer function (transfer of data) with a function of displacement measurement.

Applications: Defense (EOS, RCWS, Radar…), Industry...



HYDRAULIC SLIP RING (ROTARY UNION)

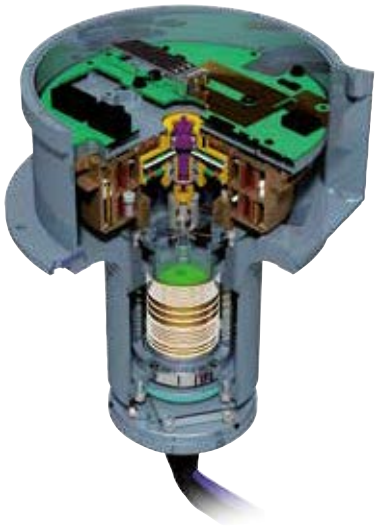
On specific request, **EXXELIA GROUP** can design and manufacture pneumatic or hydraulic transfer functions. This Specific equipment is called a Rotary Union (RU). **EXXELIA GROUP** Rotary Unions have from 1 up to more than 4 channels (for a pressure up to 250 bars). Most of the time, a Rotary Union is a part of a Slip ring.

Applications: Defense (Radar, Turret...), Industry...

PLUG & PLAY SOLUTIONS

In order to offer the highest integration of the biggest number of functions in the smallest volume, **EXXELIA GROUP** can propose PLUG & PLAY Solutions. These solutions are in fact the possibility to integrate and to combine all together the maximum functions offered by the company.

The interest of such a system is to make it more compact by decreasing the weight and the costs of the global system.

List of functions:

- Slip ring,
- Position sensor: Optical encoder, Magnetic position sensor...
- Fiber Optical Rotary Joint (FORJ) / Rotary Union (RU) / Rotary joint (L-Band),
- Mux/Demux electro optical electronics,
- Flexible coupling.