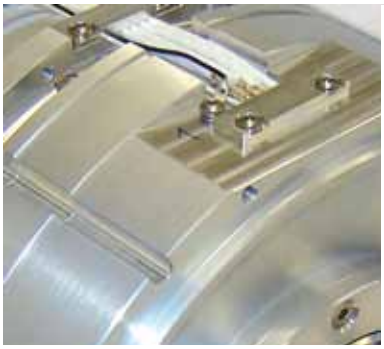
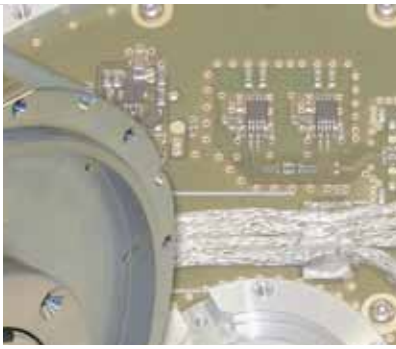
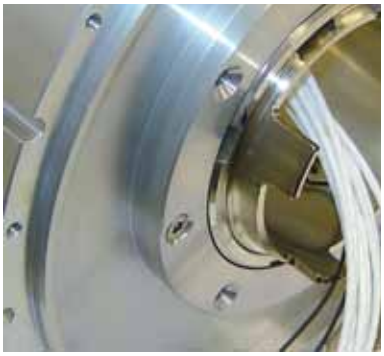
SPINNER || CONTACTLESS DATA & POWER-TRANSMISSION


Edition A/2014

High Frequency Performance Worldwide

www.spinner-group.com

For more than 65 years, SPINNER Group has been setting new standards worldwide in high frequency technology with our products. SPINNER has become one of the leading manufacturers in rotary joints due to our innovative approach, technical expertise and quality standards.

Our products are used in maritime applications (above and below water), on land, in the air and space. In all applications, the trend towards digitization and ever increasing data rates is continuing

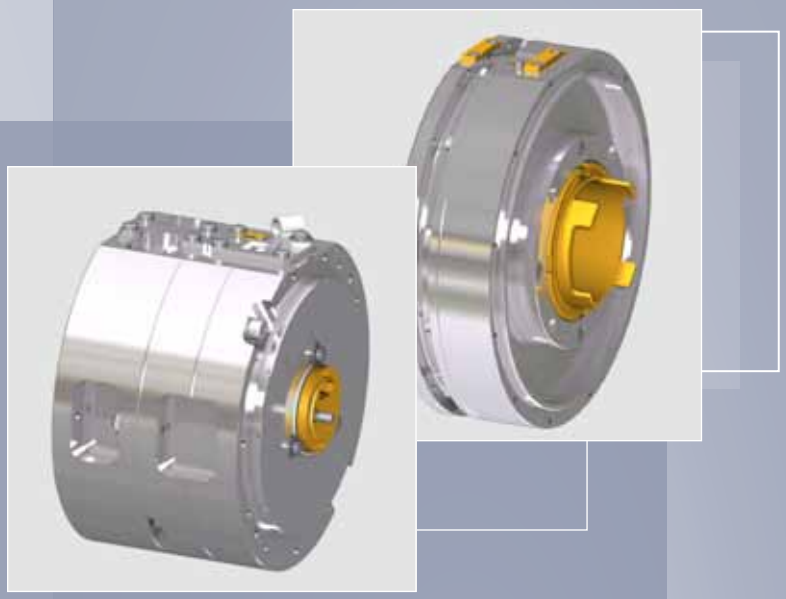
We are responding to this trend and have developed systems for contactless, digital data and power transmission without using slip rings. Due to the absence of slip rings and brushes, the transmission system is maintenance-free and even with high rotation speeds, there will be no failure of transmission.

At the same time, SPINNER offers a system for contactless power transmission. Based on inductive transmission (like with wireless charging of cell phones), energy from the stator to the rotor is transmitted with extremely high efficiency in a contactless manner, and is also completely maintenance-free.
SPINNER offers "pure" power transmission systems (DC/DC converters), as well as combinations with contactless data transmission.

SPINNER can customize solutions to suit specific conditions; do not hesitate to contact us to discuss your needs!

Applications:

- Mechanical Engineering
- Wind Power
- Robotic Systems
- Medical Applications
- Civil and Military Radar Systems
- Optical Surveillance Systems



As is now standard in many areas of technology, Ethernet is used as a standard interface for data transmission and SPINNER has developed a contactless coupler (also referred to as a module) that can be provided with different inner diameters.

In contrast to transmission by means of a traditional slip ring, the Ethernet module also supports Gigabit Ethernet irrespective of the dimensions, while the correct standard is detected and transmitted automatically (10 Base-T (10 Mbit/s) or Fast Ethernet (100 Mbit/s) or Gigabit Ethernet (1 Gbit/s) – i.e. Plug and Play.

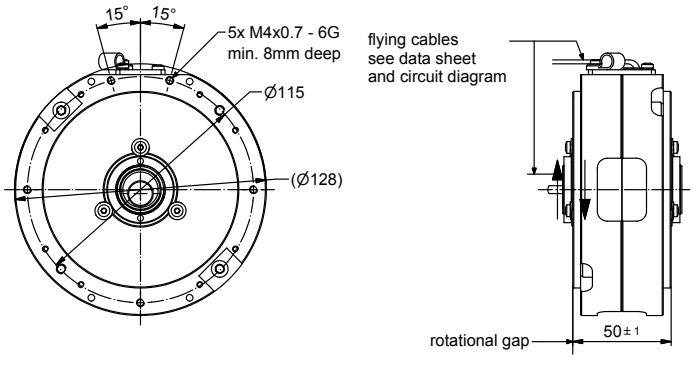
Without requiring any adjustments, the data transmitter is fully compatible with Profinet (class A + B); a version with CAN bus (repeater mode up to 500 Kbit/s) is also available.

The mechanical system has been designed in such a way that one or two transmission modules can be incorporated, also in combination with the DC/DC converter described below. The converter has been designed so that more than 50 watts with 24 V output voltage are still available to the user in addition to the rotor's own power supply.

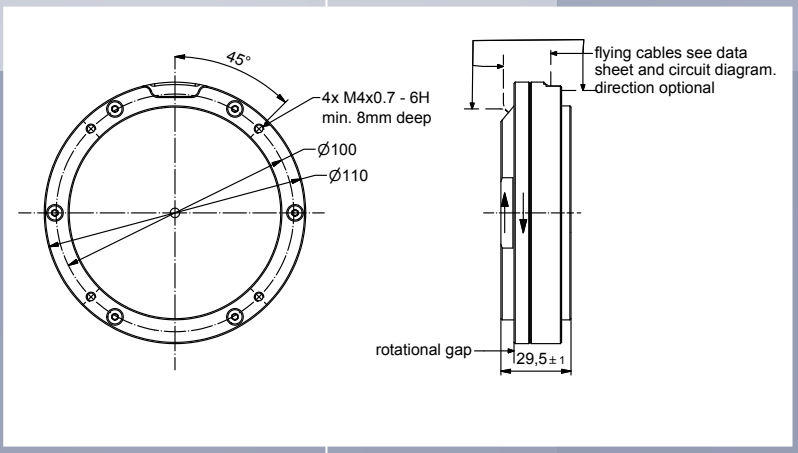
	Ethernet 1Gbit	CAN	2 x 100 Mbit	potential free inner diameter	DC/DC converter	input voltage	output external
Contactless Data Transmission							
BN 636689C0001	x			16 mm			
BN 636689C0002		x		16 mm			
BN 636689C0003	x	x		16 mm			
BN 636689C0004	2 x			16 mm			
BN 636689C0005			x	16 mm			
BN 636681	x			70 mm			
Contactless Data & Power Transmission							
BN 636684C0001	x			2.5 mm	x	24 V	24 V / > 50 W
BN 636684C0002		x		2.5 mm	x	24 V	24 V / > 50 W
BN 636684C0003	x	x		2.5 mm	x	24 V	24 V / > 50 W
BN 636684C0004	2 x			2.5 mm	x	24 V	24 V / > 50 W
BN 636684C0005			x	2.5 mm	x	24 V	24 V / > 50 W
Contactless Power Transmission							
BN 636688				5 mm	x	24 V	24 V / 100 W

DATA TRANSMISSION MODULE

Supported Ethernet standards	10BASE-T (IEEE802.3 Clause 14) 100BASE-TX (IEEE802.3 Clause 25) 1000BASE-T (IEEE802.3 Clause 40) Auto negotiation provided to select Ethernet-Standard and full/half duplex mode automatically
Frame loss ratio according to RFC2544 / BER	≤ 1 x 10^{-9} / BER ≤ 1 x 10^{-12}
Supply voltage stator / rotor	24 V
Data interface connector	4 shielded twisted pairs at rotor and stator side for each channel, AWG28
Rotating speed max.	300 rpm
Life time	200 x 10^{6} revolutions
MTBF	300.000 h
Torque max.	0.5 Nm
Case material	aluminum alloy
Case surface finish	chromate conversion coat per MIL-DTL-5541
Ambient temperature range	- 30 °C ... 71 °C
Weight, approx.	1.5 Kg



POWER TRANSMISSION MODULE



Our contactless power transmission system is a rotationally symmetric system for contactless transmission of electrical energy. This transmission system is used for the DC voltage supply of control systems, sensors or other consumers on rotating shafts.

The functioning of the transmission system corresponds to that of a galvanically isolated DC voltage transmitter. It keeps the output voltage nearly constant regardless of the load and over a wide input voltage range. The output has a short-circuit-proof and open-circuit-proof design.

A major advantage is the presence of a hollow shaft, which means that combinations with optical single-channel or multi-channel rotary joints are possible for data transmission.

This DC/DC converter meets all standards common in the industry with respect to safety, interference immunity and emitted interference.

Input voltage	21.6 V - 28.0 V DC
Output voltage	24 V DC ± 3%
Output current nominal	4 A
Output ripple, max.	80 mV
Efficiency, typ.	85% @ full load
Rotating speed,, max.	300 rpm
Life time, min.	200 x 10^6 revolutions
MTBF	300.000 h
Standards	DIN EN 55022 DIN EN 61000-4-2 DIN EN 61000-4-3 DIN EN 61000-4-4 DIN EN 61000-4-6
EU Directive	EMC Directive 2004/108/EC

APPLICATION – CIVIL AND MILITARY RADAR SYSTEMS

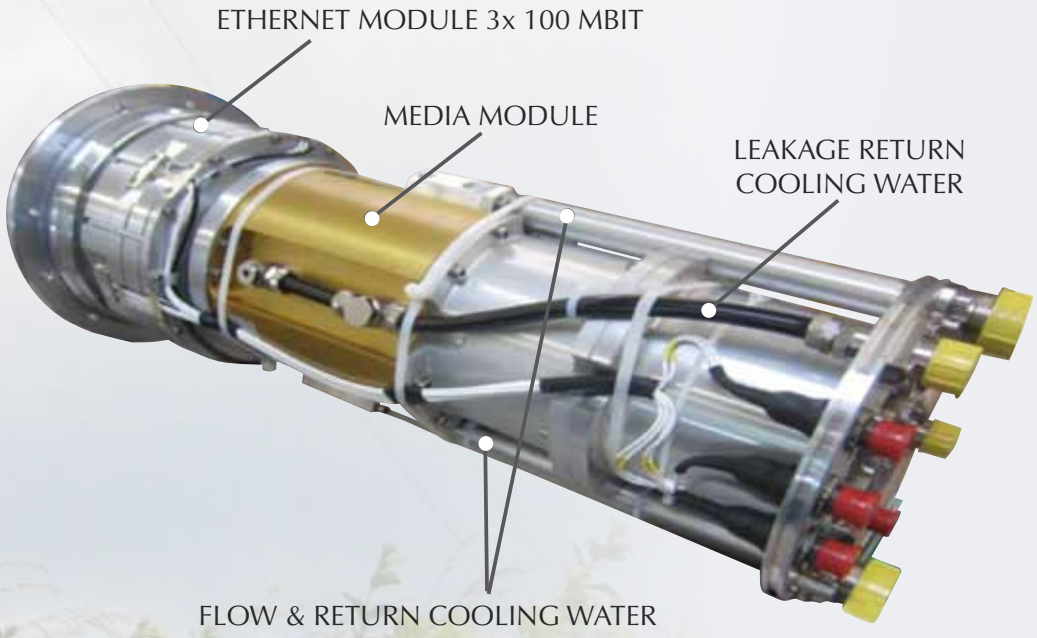
In the radar technology sector, the trend towards installing active components directly on the antenna is continuing.
The radical reduction in cabling saves weight and increases the efficiency of the system. However, ever increasing amounts of data with high transmission rates also require demanding digital data transmission solutions.

For radar rotary joints, this means that traditional HF modules for the different frequency bands are replaced by diverse media couplers, power current and signal transmission paths.

Transmission amplifiers, now installed on the rotatable part of the radar antenna, require media couplers to create a cooling circuit in order to ensure cooling. Power current is traditionally supplied by means of a slip ring.

The electrical signals to and from the active antenna equipment are no longer transmitted by a contacting slip ring but via a multi-channel fiber optical rotary joint or means of a contactless coupler.

As the newly developed, contactless modules can be provided with virtually any inner diameter, all conceivable versions of hybrid rotary joints are possible.



This hybrid rotary joint does not include any traditional RF rotary joint. Various contactless data transmission systems are used to control the radar transceivers on the rotating platform.

APPLICATION – OPTICAL SURVEILLANCE SYSTEMS

At the beginning of 2013, SPINNER started to develop a completely contactless rotary joint system, consisting of a DC power transmission module and an optical channel.
In this system, the optical channel was highly integrated into the DC power module, resulting in an extremely compact form factor with permissible rotational speeds of up to 3,000 rpm.

The nominal output voltage of the contactless power transmitter is 12 V, however, the technology applied allows adjustment to higher output voltages such as 24 V (industry standard).

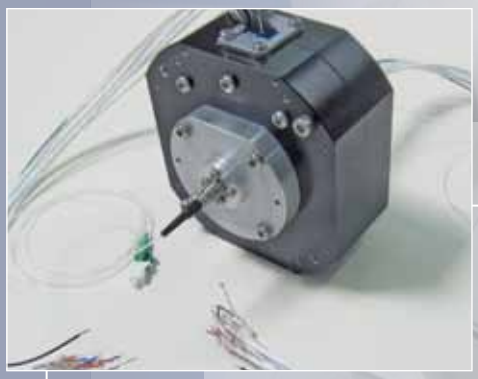
360° CAMERA SYSTEM

APPLICATION – WIND POWER

In wind power stations, digital, contactless transmission systems can also contribute to increased reliability. In order to control and monitor wind power stations, BUS systems such as Ethernet, Profinet and CAN are used. These signals are currently transmitted by means of slip rings.

Due to the natural wear of the slip rings, down-times for maintenance purposes are inevitable. SPINNER's contactless data transmitters for common BUS systems help to minimize down-times and reduce operating & maintenance costs.

Similar compact, digital data transmission units for Ethernet 1 Gbit and CAN are currently produced and delivered for use in wind power stations. A combination with a FOC rotary joint is also possible.



SPINNER ICT, Inc.
5126 S. Royal Atlanta Drive
Tucker, GA 30084-3052
USA
tel.: +1 770 2636 326
fax: +1 770 9343 384
info-atlanta@spinner-group.com

SPINNER Austria GmbH
Triester Str. 190
1230 Wien
AUSTRIA
tel.: +43 1 66277 51
fax: +43 1 66277 5115
info-austria@spinner-group.com

SPINNER Telecommunication Devices Co., Ltd.
351 Lian Yang Road
Songjiang Industrial Zone
Shanghai
201613 P.R. **CHINA**
tel.: +86 21 577 45377
fax: +86 21 577 40962
info-china@spinner-group.com

SPINNER France S.A.R.L.
1, Place du Village
Parc des Barbanniers
92632 Gennevilliers Cedex
FRANCE
tel.: +33 1 41479 600
fax: +33 1 41479 606
info-france@spinner-group.com

SPINNER Elektrotechnik OOO
Kozhevnicheskaja str. 1, bld. 1
Office 420
115114 Moscow
RUSSIA
tel.: + 7 495 6385 321
fax: + 7 495 2353 358
info-russia@spinner-group.com

SPINNER Electrotécnica S.L.
c/ Perú, 4 – Local n° 15
28230 Las Rozas (MADRID)
SPAIN
tel.: +34 91 6305 842
fax: +34 91 6305 838
info-iberia@spinner-group.com

SPINNER Nordic AB
Kråketorpsgatan 20
43153 Mölndal
SWEDEN
tel.: +46 31 7061670
fax: +46 31 7061679
info-nordic@spinner-group.com

SPINNER Middle East FZE
Techno Park, Building B
Office 332
Jebel Ali Free Zone
P.O. 262 854
Dubai
UNITED ARAB EMIRATES
tel.: +971 4 880 7343
fax: +971 4 880 7353
info-me@spinner-group.com

SPINNER UK Ltd.
Suite 8 Phoenix House
Golborne Enterprise Park,
High Street
Golborne, Warrington
WA3 3DP
UNITED KINGDOM
tel.: +44 1942 275222
fax: +44 1942 275221
info-uk@spinner-group.com

SPINNER GmbH | Headquarters | Erzgiessereistr. 33 | 80335 München | Germany
Tel.: +49 89 12601-0 | Fax: +49 89 12601-1292 | rs@spinner-group.com | www.spinner-group.com
Certified according to DIN EN ISO 9001 / 14001

0.5/RS/Feiner 09.2014