

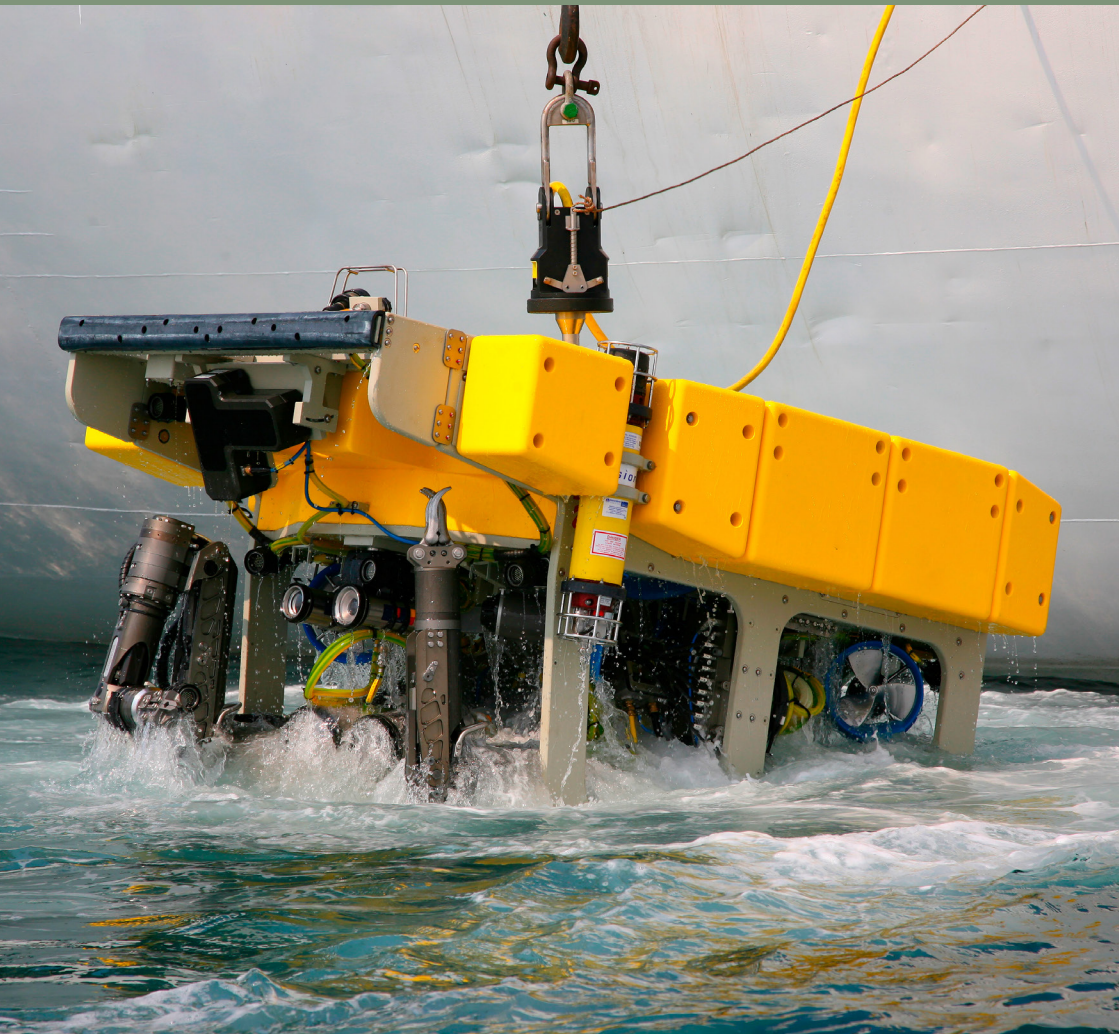


CONTACTLESS **ROTARY** JOINTS

Fibre Optic Rotary Joints



One of the only Slip Ring manufactures to
design and manufacture our own range of
Fibre Optic Rotary Joints (FORJs)



Born through Research & Development, BGB's highly successful range of Fibre Optic Rotary Joints (FORJs) can be found in rotary applications all over the world.

The BGB **FJ Series** of FORJ's consist of:

- FJ1 - Single Channel
- FJ2 - Two Channel
- FJ3 - Three Channel+
- FJ4 - Mini
- FJ5 - L Type
- FJ6 - Capacitive
- FJ7 - Media Converter
- FJ8 - WDM



STANDARD SINGLE CHANNEL - BGB OWN BRAND



*Standard FORJ with Flange Mount & ST Connector

BGB's Standard FORJ is available with ST connections and designed for either Singlemode or Multimode.

Rigorously tested by Deutsch UK Ltd to EN2591-601, (Aerospace series - Elements of electrical and optical connection Part 601: Optical elements - Insertion loss) and to EIA standards.

BGB's standard range of FORJs are currently being implemented within leading global wind turbine manufacturers and has been successfully used in other industry applications such as centrifuges, rotating media displays, wastewater, radar systems and ROVs around the world.

The BGB standard FORJ system has been produced to revolutionise the slip ring market. Single Channel versions were the first of the new generation of contactless slip rings to be produced by BGB. The fibre optic rotary joint (FORJ) is ideal for high speed data-transfer within many applications.

Constructed in stainless steel, the FJ1 Series of FORJs have exceptional durability protecting the units from dust and water ingress to IP68 (dependent on fibre and connection system) and is not influenced by vibration, humidity, heat, magnetism or other typical disturbances.

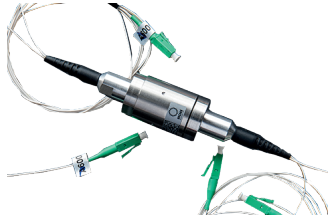


*Standard FORJ - IP68 & Low Back Reflection

OTHER FORJ VARIANTS (Available On Request)

2 Channel Singlemode & Multimode.

Typical applications include:
Robotics, Camera dollies for HDTV cameras, Electro-optical camera systems.



FJ2
Two Channel

3-8 Channel Singlemode & Multimode.

Typical applications include:
Military, ROV's, Revolving Stages, Radar, Offshore, Cable winches.



FJ3
Three Channel+

3-20 Channel Singlemode & Multimode.

Typical applications include:
Military (tracking platforms, radar systems), Offshore / Cable winches on ships, Theatres / Revolving stages.



Mini 1 Channel. Singlemode & Multimode.

Typical applications include:
Pitch slip rings / Wind energy, Camera dollies, 4K/8K video, Cable winches, Airborne targeting, Radar systems.



FJ4
Mini

L-Type 1 Channel

Singlemode & Multimode.
Typical applications include:
Helicopters, Industrial Automation, Military, Medical slip rings for video signals.



FJ5
L-Type

SLIP RING ASSEMBLIES WITH FORJ

BGB can build all FORJ products into bespoke slip ring solutions incorporating connections to suit each individual requirement.

Data transfer would not be vulnerable to electromagnetic interference from high frequencies. Slip ring assemblies with FORJ for data would also not be susceptible through data loss due to low resistance contact on an infrequently used low power data ring.



Key benefits:

- Minimal wired connections
- Minimal torque
- Easily serviced
- Complete packaged solution
- Tried and tested in the wind industry
- All encased in an IP rated enclosure
- Adaptable to all environmental conditions
- Immune to all forms of electrical interference (FORJ)
- Future proof - if bandwidth needs increasing in future, electronic components can be changed easily

CAPACITIVES



Capacitives are Contactless data transmitters for rotating systems. They are especially beneficial for ensuring reliable transmission whenever slip rings are inadequate due to large system diameters and/or data volumes.

The contactless data transmission channel offers improved lifetime and reliability without the need for maintenance. The contactless design guarantees error free data transmission even at very high rotating speeds. The IRT version supports Profinet class C and other real time protocols. The data transmission channel is realised by a rotating capacitive coupler.

Industries already using capacitive technology include: Wind power, Construction, Military, Stage Technology, non-destructive material testing systems and Medical.



MEDIA CONVERTERS



Fibre media converters are simple networking devices that make it possible to connect two dissimilar media types, such as twisted pair with fibre optic cabling.

They are important in interconnecting fibre optic cabling-based systems with existing copper-based, structured cabling systems.

Fibre media converters support many different data communication protocols including Ethernet, Fast Ethernet, Gigabit Ethernet, T1/E1/J1, DS3/E3, as well as multiple cabling types such as coax, twisted pair, multi-mode and single-mode fibre optics.



Media converter types range from small stand alone devices and PC card converters to high port-density chassis systems that offer many advanced features for network management.

Other benefits of media conversion include providing a gradual migration path from copper to fibre. Fibre connections can reduce electromagnetic interference.

BGB Media converters can now be produced to enable multiple ethernet connections and built in switches.



MEDIA CONVERTERS



BGB Media converters are ruggedised and purpose built with hard anodised enclosures. Built for 6kv transient surge protection, BGB Media converters are manufactured to withstand the harshest of environment and conditions.

Temperature:

Operating -40°C through +90°C ambient
Storage -50°C through +125°C ambient

Network Speeds:

10 / 100 / 1000 mbs

Din-rail mountable on request

Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 12, ENV50204, EN55024, EN61000-6-2, heavy industry level, criteria A

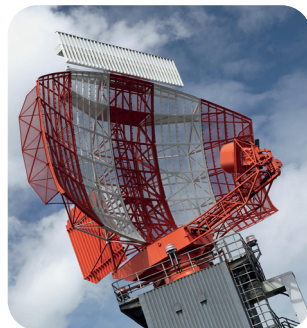
IEC 61850 and IEEE 1613 Environmental Standard for Electric Power Substations.



WAVELENGTH DIVISION MULTIPLEXERS



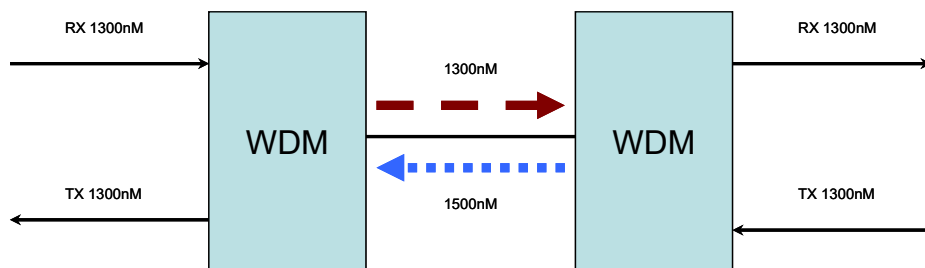
Wavelength Division Multiplexer (WDM) systems are popular with telecommunications companies and some pitch control manufacturers. WDMs allow these companies to expand the capacity of the network without laying more fibre. By using WDM and optical amplifiers, they can accommodate several generations of technology development in their optical infrastructure without having to overhaul the backbone network. Capacity of a given link can be expanded by simply upgrading the multiplexers and demultiplexers at each end.



This is often done by using optical-to-electrical-to-optical (O/E/O) translation at the very edge of the transport network, thus permitting interoperation with existing equipment with optical interfaces.

Most WDM systems operate on single-mode fibre optical cables, whereas the standard FORJ range is designed to operate on both single and multi-mode.

Wavelength-division multiplexing (WDM) technology in the LAN is especially beneficial in situations where fibre is in limited supply or expensive to provision. As well as conventional dual strand fibre converters, with separate receive and transmit ports, there are also single strand fibre converters, that can extend full-duplex data transmission up to 70 kilometres over one optical fibre.



* Diagram shows WDMs in operation

WAVELENGTH DIVISION MULTIPLEXERS

The new BGB Wavelength Division Multiplexer (WDM) has been designed to compliment the BGB Optilinc FORJ (Fibre Optic Rotary Joint) to convert two fibre (duplex) systems to a single fibre multiwave length system (simplex).

Its unique rugged design has been developed to adapt itself to all environmental conditions. Designed to survive the arduous [physical and electrical] environments found in the wind energy industry (which insist on inbuilt transient surge protection), the WDM protects itself from lightning strikes via inbuilt electronic clamping systems.

When combined with BGBs standard FORJ, the WDM lends itself to all applications whether it be light or heavy industry. Available as a 100Mb or GigaBit converter.



ADVANTAGES OF FIBRE OPTICS

Why are fibre-optic systems revolutionising the market? When compared to conventional metal wire (copper wire), optical fibres are:

- **Thinner** - Optical fibres can be drawn to smaller diameters than copper wire.
- **Higher carrying capacity** - Because optical fibres are thinner than copper wires, more fibres can be bundled into a given-diameter cable than copper wires.
- **Less signal degradation** - The loss of signal in optical fibre is less than in copper wire.
- **Light signals** - Unlike electrical signals in copper wires, light signals from one fibre do not interfere with those of other fibres in the same cable.
- **Low power** - Because signals in optical fibres degrade less, lower-power transmitters can be used instead of the high-voltage electrical transmitters needed for copper wires.
- **Digital signals** - Optical fibres are ideally suited for carrying digital information.
- **Lightweight** - An optical cable weighs less than a comparable copper wire cable. Fibre-optic cables take up less space.
- **Flexible** - Because fibre optics are so flexible and can transmit and receive light, they are used in many flexible digital cameras for the following purposes:
 - Medical imaging - in bronchoscopes, endoscopes, laparoscopes
 - Mechanical imaging - inspecting mechanical welds in pipes and engines (in airplanes, rockets, space shuttles, cars)
 - Plumbing - to inspect sewer lines



APPLICATIONS

The range of FORJs and accompanying electronic devices are adaptable for the most demanding of applications. Made to withstand the harsh environments of offshore windfarms, the standard range of FORJs have exceptional durability protecting the units from dust and water ingress to IP68.

Applications include:

- Wind Turbines
- ROVs (Remotely Operated Vehicles)
- Vehicle Turrets & Helicopters
- Robotics
- Fibre Optic Cable Reels
- Packaging Machines
- Medical Systems
- Radar Antennas
- Security & Military Systems
- Material Handling
- Video Surveillance Systems
- Marine Propulsion
- Sensor Platforms
- Rotating Media Displays & TVs
- Centrifuges
- Semiconductor Industry

.... And many more.



WHY BGB?...

As the world's most trusted brand in Slip Ring Systems we have a longevity of quality and service life history for our rotary assemblies in major OEMs around the globe. BGB are one of the only slip ring companies to manufacture and design own brand Fibre Optic Rotary Joints.

Our Vision:

"To be a trusted leader in smart rotary transfer solutions supporting global sustainability"

Our Purpose:

"An exceptional company to work for and with, attracting and developing great people, sharing success whilst staying true to our values"

Our Mission:

"We are tenacious in our pursuit to engineer & deliver innovative Products and Services with our selected partners worldwide"







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