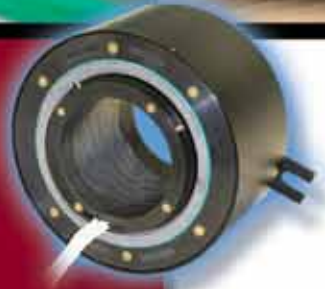


Motion Technology Slip Rings

Product Guide



A complete line of slip rings and rotary components for commercial, industrial, medical, marine, wind energy, aerospace and defense applications.

- Through-Bores
- Capsules
- High Speed
- Large Diameter
- Separates / Platter Separates
- Fiber Optic Rotary Joints (FORJ)
- Fiber Optic Hybrid Units
- Multiplexers
- Electro-Optic Systems
- Vehicular
- Helicopter
- Propeller
- Miniature Capsules
- FPSO Swivels
- Fluid Rotary Unions (FRU)

MOOG
COMPONENTS GROUP

Commercial & Industrial

Slip ring products can be used in any electromechanical system that requires unrestrained, continuous rotation while transmitting power and / or data from a stationary structure to a rotating device. A slip ring is also called a rotary electrical interface, collector, swivel or a rotary joint.

Slip Rings With Through-Bores

The unobstructed bore through the center provides routing space for hydraulics, pneumatics or for a concentric shaft mount. Our through-bore slip rings feature fiber brush technology which offers several advantages over conventional slip ring technology, including multiple points of contact per brush bundle, low contact force per fiber and low contact wear rates. In addition, fiber brushes do not require lubrication and produce virtually no wear debris.

SRA-73683, 1/2 Inch

- 1/2 inch through-bore
- Compact 1.375 inch outside diameter
- Speeds up to 120 rpm continuous
- Continuous rotation of power and / or data signals
- 6, 12, 18 or 24, 2 amp circuits



AC6438, 1/2 Inch

- 1/2 inch through-bore
- Compact 2.1 inch outside diameter
- Speeds up to 250 rpm continuous
- Multiple circuit configurations
- Continuous rotation of power and / or data signals
- High-impact thermoplastic construction
- Gold plated rings



AC6349, 1 Inch

- 1 inch through-bore
- 6, 12, 18 and 24 circuit models
- 15 amp rings

- Precision ball bearings for long life
- Speeds up to 250 rpm continuous
- Compact size
- Sealed units available
- Flying leads
- Fully compatible with both analog and TTL control level signals
- Rugged black anodized aluminum construction



AC4598, 1-1/2 Inch

- 1-1/2 inch through-bore
- Speeds up to 250 rpm continuous
- 6, 12, 18 or 24, 10 amp circuits
- 16 gauge, 12 inch lead wire (longer lead lengths are available)
- Higher rotational speeds with alternate bearings (optional)
- Various axial and radial lead exits are available
- Splash seals for dust and moisture resistance
- Standard collar mounting; flange mounting optional
- Also available with 12, 24, 36 and 48, 2 amp rings or power and signal combinations



AC6200, 1-1/2 Inch

- 1-1/2 inch through-bore
- Speeds up to 250 rpm continuous
- 12, 24, 36 and 48 circuit versions with 2 amp contacts
- Power and signal (10 and 2 amp) circuits may be combined
- Shaft, brush block and cover are molded of high-impact thermoplastic
- Optional steel bearing and splash seals for harsh environments (special order)
- Collar mounting is standard; flange mounting optional
- 26 gauge color coded, 12 inch lead wires
- Continuous 360° rotation of power or data signals
- Also available with 6, 12 and 18, 10 amp rings
- Silver plated rings, silver alloy brushes



AC6815, 1-1/2 Inch

- 1-1/2 inch through-bore
- Speeds up to 250 rpm continuous
- Power and signal (2, 3.5 and 10 amp) circuits may be combined
- Collar mounting is standard; flange mounting optional
- 16, 24 and 26 gauge, 24 inch lead wires
- Continuous 360° rotation of power or data signals
- Gold alloy bifurcated brushes, gold plated rings
- Prewired for high speed data transmission



AC6428 / AC6429, 1-3/8 Inch

- 1-3/8 inch through-bore
- Speeds up to 250 rpm continuous
- Multiple circuit configurations
- Continuous rotation of power and / or data signals
- High-impact thermoplastic construction
- Sealed to dust and light fluid splash



AC6275, 2-3/4 Inch

- 2-3/4 inch through-bore
- Compact 6.63 inch outside diameter
- Modular design - a single module can have: one 50 amp ring; two 30 amp rings; one, two or three 10 amp rings or six 5 amp signal rings
- Up to 24-50 amp circuits, 48-30 amp circuits, 72-10 amp rings or 144-5 amp rings in a 24 module length, or combinations of all four in a single housing
- Speeds up to 1,000 rpm continuous
- Steel bearings and machined shaft and housing for harsh environments
- Collar mounting is standard; flange mounting is optional
- Various lead exits are available
- Silver plated rings are standard (gold plated, optional)
- 20, 16, 10 and 8 gauge lead wire
- Continuous 360° rotation of power or data signals



- Sealed unit
- Brush assemblies are field serviceable (if required)
- Available as slip ring brush block separates

AC6098, 4 Inch

- 4 inch through-bore
- 1 to 72 signal rings (signal up to 10 amps)
- 1 to 24 power rings (30 amp or 50 amp or some combination)
- Can combine signal and power in same slip ring
- Handles controller signals
- Speeds up to 250 rpm continuous
- Silver plated rings; silver alloy fiber brushes
- Sealed against dust and splash
- Brush assemblies are field serviceable (if required)



Endura-Trac™ Standard W Series

The flexible design and through-bore capability of up to 3 inches, along with many other options, make it ideal for a designer to incorporate into new and retrofit applications.

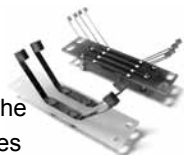


- Unobstructed bore sizes from 1-1/2 to 3 inches
- Up to 24 signal circuits, up to 12 power circuits
- Continuous bidirectional rotation up to 60 rpm
- All metal dust cover
- Flying lead wire bundle, 24 inch leads
- #20 AWG signal lead wire, #12 AWG power lead wire
- Shaft, rotor or both can rotate
- Leadwires can exit from same or opposite ends of the rotor and stator

Endura-Trac™ Accessories

Our pre-engineered slip rings feature a flexible design, minimized lead times and maximum reliability.

The Mounting Collar Kit attaches to either end of the slip ring rotor and facilitates mounting to a shaft.



Drive Adapter Kits are the perfect solution for soft mounting the stator section of the slip ring.

Split Slip Rings

For some applications, particularly machinery and equipment upgrades, it is impossible to access either end of the rotating shaft to allow the addition of a conventional slip ring. For these applications, we have a special slip ring solution which includes a split slip ring and a conventional brush block.



Slip Ring Capsules

SRA-73540

This slip ring, we call the mini, is our newest design and smallest physical package. It can incorporate up to 12 circuits, each rated at 2 amps. This unit is ideal for use where mounting space is limited and critical, without sacrificing current handling capability.



- 6 and 12 circuit models
- 2 amp, 120 VDC / VAC circuits
- Precision assembly to provide exceptional rotational life
- Speeds up to 250 rpm continuous
- Compact .44 inch diameter, .44 inch long
- Gold-on-gold contacts
- Mounting flange on housing
- Flexible, color-coded, silver-plated, stranded copper lead wire
- Superior handling of low level control signals

SRA-73625

The SRA-73625 miniature capsule provides up to 18, 2 amp rated contacts in a small, .44 inch diameter design. Color-coded lead wires are provided on both the rotor and stator to allow simplified electrical connections. Similar in design to our SRA-73540, the SRA-73625 allows tremendous flexibility in dealing with system size restrictions.



- 18 circuit
- 2 amp, 120 VDC / VAC circuits
- Precision assembly to provide exceptional rotational life
- Speeds up to 100 rpm continuous
- Compact size .50 inch diameter, .58 inch or .83 inch long
- Gold-on-gold contacts
- Mounting flange on housing
- Flexible, color-coded, silver-plated, stranded copper lead wire
- Superior handling of low level control signals

AC6373

The AC6373 miniature capsule provides up to 12, 2 amp rated contacts in a small, diameter design.



- 6 and 12 circuit models
- 2 amp, 120 VDC / VAC circuits
- Precision assembly to provide exceptional rotational life
- Speeds up to 100 rpm continuous
- Compact size .50 inch diameter, .58 inch or .83 inch long
- Gold-on-gold contacts
- Mounting flange on housing
- Flexible, color-coded, silver-plated lead wire
- Superior handling of low level control signals

SRA-73526 / SRA-73528 / SRA-73599

- 6, 12, 18 and 24 circuit models
- 2 amp / 210 VDC / 240 VAC circuits
- Precision ball bearings meet or exceed life requirements for most commercial applications
- Speeds up to 250 rpm continuous
- Compact size: .77 inch to 1.44 inch lengths (depending upon number of circuits)
- Gold-on-gold contacts
- 12 inch standard lead lengths
- Compatible with data bus protocols
- Flexible, color-coded, silver-plated, Teflon® insulated lead wires
- Transfers analog and digital signals



AC6023

The AC6023 slip ring capsule is a standard, off-the-shelf unit that uses gold contacts at the rotary interface. Color-coded lead wires are used on both the stator and rotor for simplified electrical connections.



- 6, 12, 18 and 24 circuit models
- 2 amp / 210 VDC / 240 VAC circuits
- Precision ball bearings meet or exceed life requirements for most commercial applications
- Speeds up to 250 rpm continuous
- Compact size: .57 inch to 1.38 inch lengths (depending upon number of circuits)
- Gold-on-gold contacts
- 12 inch, 24 inch, 36 inch, 48 inch standard lead lengths
- Compatible with data bus protocols
- Sealed units are also available (dust and light splash only)
- Flexible, color-coded, silver-plated, Teflon® insulated lead wires
- Transfers analog and digital signals
- Also available with 5 and 10 amp power rings combined with 2 amp rings

SRA-73574 / SRA-73587

The SRA-73574 / SRA-73587 provides an economical, readily available solution when a compact, high circuit count configuration is required. Our standard units, offer 36, 2 amp, 4, 10 amp and 24, 2 amp signal rings, respectively. These units can be modified to provide various combinations of power, signal and coax circuits.

- 2 amp and 10 amp circuit combinations standard
- Precision ball bearing for long life
- Speeds up to 250 rpm continuous
- Compact size
- Transfers analog and digital signals
- Compatible with data bus protocols



AC6355

The AC6355 provides an economical, readily available solution when a compact, high circuit count configuration is required.

Available in 3.50 and 2.60 inch lengths with 36 and 56 two amp signal ring configurations, respectively.

- Standard 36 and 56 circuit models with 2 amp circuits
- 2 amp, 5 amp, 10 amp circuit combinations standard; 50 or 75 ohm coax circuit combinations are optional
- Precision ball bearing for long life
- Speeds up to 250 rpm continuous
- Sealed units available (dust and light splash only)
- Metal housing available
- Transfers analog and digital signals
- Compatible with data bus protocols



AC6305 / 6310

- 6, 9, 12 and 15 circuits models
- 5 amp / 2 amp and 10 amp / 2 amp circuit combinations
- Precision ball bearing for long life
- Compact 1.38 inches length
- Speeds to 250 rpm continuous
- Gold-on-gold contacts
- 12, 24, 36, 48 inch standard lead lengths (longer leads available)
- Sealed units are also available (dust and light splash only)
- Flexible silver-plated copper, color-coded, Teflon® insulated lead wires
- Fully compatible with both analog and TTL control level signals
- Also available with 6, 12, 18, and 24, 2 amp rings.



P Series

P series slip rings are compact, cost effective, mercury-free slip rings designed for industrial manufacturing. The P2 has 2 rings, each able to carry 7 amps. The P4 has 2 rings rated at 7 amps and 2 at 2 amps. All are fully ball raced and suitable for mounting in any orientation.



- Mercury free
- Reliable rotational connections for power, signal and data transmission
- Speeds from 100 to 600 rpm
- Fast on spade terminals or flying leads
- CE marked

High Speed Slip Rings

PH Series

Suitable for industrial applications such as general purpose instrumentation and testing, the PH series rugged design makes it an optimum choice for adverse operating conditions.



- Optimum in adverse operating conditions
- Continuous silver connection ensuring minimal thermal error
- Compatible with the thermocouple and strain gauge instrumentation
- Quick and easy to install
- Available in either 8 or 12 circuits
- Speeds up to 20,000 rotations per minute

AC3757

- 36 circuits
- High speed performance with customer's cooling systems:
 - 4,000 rpm without cooling
 - 6,000 rpm with gas cooling (nitrogen)
- Thermocoupled leads are available
- Low noise
- Cooling tubes



AC6231

- 1-1/2 inch through-bore
- Compact 4.25 inch outside diameter
- Speeds up to 2,500 rpm continuous
- Transfers power, as well as analog and digital signals
- Rugged black anodized aluminum construction



EC3848

The EC3848 features precious metal contacts at the rotary interface. Flying lead wires on the rotating side and solder terminals on the stator side complete the electrical connections.



- 1 amp / 100 VDC circuits
- 2, 6, 8, and 10 circuit models
- Speeds up to 10,000 rpm without cooling
- Precision ball bearings

Endura-Trac™ Plus W Series

Developed for a variety of applications and environments. The flexible design and through-bore capability up to 9 inches, along with many other options make it ideal for a designer to incorporate into new or retrofit applications.



- Unobstructed bore sizes from 1-1/2 to 9 inches
- Up to 100 signal circuits (rated at 250 V / 5 amps each), up to 24 power circuits (rated at 600 V / 30 amps each)
- Continuous bidirectional rotation up to 1,000 rpm
- Flying lead wire bundle, 24 inch leads
- #20 AWG signal lead wire, #12 AWG power lead wire
- All metal exterior cover
- Shaft and flange mounting
- Stator, rotor or both can rotate

PM Series

Suitable for a wide variety of industrial applications, the PM series is designed to transmit power and data signals at high speeds.



- Available with 8, 12 and 24 circuits
- Low torque required to drive this unit
- Transmits power and data signals at high speeds
- Compatible with thermocouple and strain gauge instrumentation
- Reliable performance under adverse operating conditions

- Continuous silver connections ensure minimal thermal error
- Quick and easy to install

Large Diameter Slip Rings

Large bore slip rings represent the union of our new manufacturing processes and technologies that enable us to offer large, high volume slip rings with advanced features that are cost effective.



- Drum or platter style
- Inside diameters up to 55 inches
- Optical single channels available with data rates up to 5 Gb / s
- Lengths to 18 inches
- Rotational speeds to 300 rpm
- Power rings rated to 1000 V with currents to 300 amps
- Data rings from DC to 80 Mb / s
- Quieter mechanical system operation
- Long maintenance-free life
- Multiple brush tip options with minimal debris

Miniature Slip Ring Separates

AC2690 / AC259

Sometimes a self-contained "capsule" slip ring is not practical due to system size constraints or cost limitations. We can provide the slip ring (rotor) and brush block (stator) as separate components to be mated by the customer into a system.



- 1-10 circuit models
- Rotor diameters less than 0.100 inch
- Options available
 - Slip ring
 - Raised barrier (.110 inch diameter)
 - V-groove (90°) in each ring

Brush block

- Flying leads
- Gold or tin plated terminals

MD6038 / MD6043

The MD slip ring separate has 6 circuits and features a 3/8 inch unobstructed bore through the center that provides routing space for hydraulics, pneumatics or for a concentric shaft mount.



- 3/8 inch unobstructed bore
- 6 circuits
- Gold-on-gold contacts
- Low noise
- Excellent signal handling performance

Platter Separates

If space and cost is an issue, platter separates can be an ideal solution. The units supplied generally consist of a slip ring based on a PCB style and a matching brush block or board depending on the requirements. Various configurations are manufactured – from simple components, through units with fixed spacing arrangements to products with integrated bearing components.



- Separate components or integrated assemblies
- Simple installation
- Pre-set brush springs

Fiber Optic Rotary Joints (FORJ)

A FORJ is a device used to pass optical signals from a stationary structure to a rotating mechanism in a fiber optic system.

We offer a variety of FORJ designs:

- Off-axis
- On-axis
- Singlemode
- Multimode

- Low cost
- Hybrid FORJ / slip ring assemblies

FO228 / FO282

The FO228 (single-pass multimode) and the FO282 (single-pass singlemode) are passive and bidirectional, and maintain the benefits of fiber optics (such as high bandwidth and EMI immunity) in systems with a rotational interface.



- Provides rotary coupling for a multimode or singlemode fiber link
- Passive bidirectional device
- Low cost
- Can be combined with our electrical slip rings and fluid unions
- Alternative drive coupling and mounting arrangements are available
- Connectorized interfaces, for easy fiber cable replacement
- Can be integrated into existing slip ring designs
- Aluminum or anodized aluminum housing
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810D functional shock (40 g)

FO197

The FO197 is a single-pass, multimode fiber optic rotary joint (FORJ). It is passive and bidirectional, and allows the transfer of any type of optical signal across rotational interfaces.



- Provides rotary coupling for a multimode fiber link
- Passive bidirectional device
- Can be combined with our electrical slip rings and fluid rotary unions
- Alternative drive coupling and mounting arrangements are available
- Connectorized interfaces
- Can be integrated into existing slip ring designs
- Stainless steel, aluminum or anodized aluminum housing
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810D functional shock (40 g)

FO206

The FO206 is a single-pass, singlemode fiber optic rotary joint. Most of the external features on the FO206 can be modified to meet the customer's custom requirements.



- Provides rotary coupling for a singlemode fiber link
- Passive bidirectional device
- Can be combined with our electrical slip rings or fluid rotary unions
- Connectorized interfaces for easy fiber cable replacement
- Customized mounting flanges available
- Optional fluid-filled version for deep submergence to 10,000 psi (69,000 kPa)
- Integration into existing slip ring designs
- Stainless steel housing
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810D functional shock (40 g)

FO285 / FO286

The FO285 (single-pass singlemode) and the FO286 (single-pass multimode) are passive and bidirectional, and allow the transfer of optical signals across rotational interfaces.



- Passive bidirectional device
- Low cost, small size
- Can be combined with our electrical slip rings and fluid unions
- Alternate drive coupling and mounting arrangements are available
- Integration into existing slip ring designs
- Stainless steel or aluminum construction
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810D functional shock (40 g)
- 90° fiber exits available for limited space requirements

FO300

The FO300 is a multi-pass fiber optic rotary joint (FORJ). It allows the transfer of optical signals across a rotational interface and is passive and bidirectional.

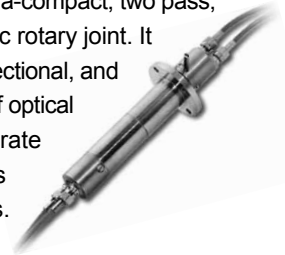


- Up to 31 fiber optic channels in a very small form factor.

- The smaller version "A" accommodates up to 19 separate singlemode or multimode optical fibers. The larger version "B" supports up to 31 separate channels.
- Can be combined with electrical slip rings and fluid rotary unions
- Stainless steel construction
- Rugged design

FO215

The FO215 is an ultra-compact, two pass, multimode fiber optic rotary joint. It is passive and bidirectional, and allows the transfer of optical signals on two separate optical fibers across rotational interfaces.



- Provides rotary coupling for two multimode fibers
- Can be combined with our electrical slip rings and fluid rotary unions
- Connectorized version allows for easy fiber cable replacement
- Customized mounting flanges available
- Optional fluid-filled version for deep submergence to 10,000 psi (69,000 kPa)
- Integration into existing slip ring designs
- Stainless steel housing (aluminum for connectorized version)
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810E functional shock (40 g)

FO257

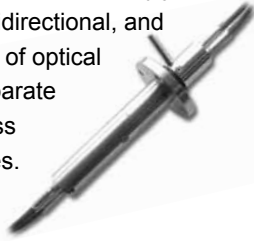
The FO257 is a compact, two pass, fiber optic rotary joint (FORJ) for plastic optical fiber.



- Provides rotary coupling for two multimode plastic large core fibers
- Passive and bidirectional
- Can be combined with various electrical slip rings and fluid rotary unions
- Customized mounting flanges available
- Integration into existing slip ring designs
- Aluminum housing
- Can be supplied with large core glass pigtailed to reduce overall system loss
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810E functional shock (40 g)

FO292

The FO292 is an ultra compact, two pass, multimode fiber optic rotary joint. It is passive and bidirectional, and allows the transfer of optical signals on two separate optical fibers across rotational interfaces.



- Provides rotary coupling for two multimode fibers
- Passive and bidirectional
- Can be combined with various electrical slip rings and fluid rotary unions
- Smaller and more compact than the standard FO215 with improved back reflection performance
- Customized mounting flanges available
- Optional 90 degree cable exits at either end of the FORJ
- Optional fluid-filled version for deep submergence to 10,000 psi (69,000 kPa)
- Can be integrated into existing slip ring designs
- Stainless steel housing
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810E functional shock (40 g)

FO242

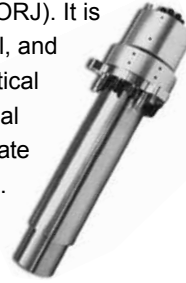
The FO242 is a multi-pass, singlemode fiber optic rotary joint. It is passive and bidirectional, and allows the transfer of optical signals across a rotational interface on 2 to 6 separate singlemode optical fibers.



- 2 to 6 singlemode channels
- Can be combined with our electrical slip rings, fluid rotary unions and the FO190 multimode fiber optic rotary joint
- Alternative drive coupling arrangements are available
- Tested to 10,000 psi (69,000 kPa) when fluid-filled
- Stainless steel and aluminum construction
- Connectorized interfaces, for easy fiber cable replacement
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810D functional shock (40 g)

FO291

The FO291 is a multi-pass, singlemode fiber optic rotary joint (FORJ). It is passive and bidirectional, and allows the transfer of optical signals across a rotational interface on 2 to 9 separate singlemode optical fibers.



- 2 to 9 singlemode channels
- Compact, connectorized design
- For use in both dry and submerged applications
- Can be combined with slip rings, fluid rotary unions and sensors to create a single hybrid unit
- Tested to military standards for temperature, shock and vibration

FO190

The FO190 is a multi-pass fiber optic rotary joint for 2 to 21 multimode fibers. It is passive and bidirectional and allows the transfer of data, video and other signals on separate fibers across rotational interfaces.



- 2 to 21 multimode channels
- Lightweight aluminum construction
- Can be combined with our electrical slip rings, fluid rotary unions and the FO242 singlemode fiber optic rotary joint
- Alternative drive coupling arrangements are available
- Tested to 10,000 psi (69,000 kPa) when fluid-filled
- Connectorized interfaces, for easy fiber cable replacement
- Rugged design
 - MIL-STD-167-1 ship vibration
 - MIL-STD-810E functional shock (40 g)
 - MIL-STD-901D heavy shock (65 g)

Large Bore Slip Rings With Optics

These large bore slip rings feature optical channels for high-speed optical communications, up to 5 Gb / s. This patented technology also has the capability to transfer multiple optical signals per optical channel, resulting in

data transfer rates in excess of 5 Gb / s per optical channel.



- ID to 55 inches, length to 18 inches
- Drum or platter style
- 80 Mb / s to 5 Gb / s per channel, aggregate data rate greater than 80 Gb / s
- Rotational speed dependant on diameter
- To 1000 V; 300 amps

Fiber Optic Hybrid Units

H18 / H24

The H18 / H24 fiber optic rotary joints effectively combine a compact electrical slip ring with a fiber optic rotating joint. Both offer the flexibility of electrical, power and optical signal transfer through a single rotational joint. The H18 and H24 are low cost solutions for high data rate transmission to greater than 2.5 Gb / s on the optical channel.

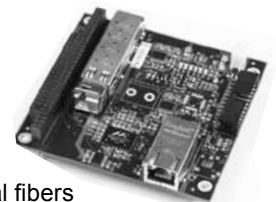


- Combined compact electrical slip ring with fiber optic rotating joint
- Flexibility of signal transfer through a single rotational joint
- Low cost solution for high data rate transmission
- Standard 18 or 24 circuit model with 2 amp circuits
- Precision ball bearing for long life
- Speeds up to 250 rpm continuous
- Compact size
- Metal housing available
- Transfer analog and digital signals
- Compatible with data bus protocols

Fiber Optic Multiplexers

907

Provides digital transmission over 1 or 2 singlemode or multimode optical fibers for 3 high quality video channels and 6



bidirectional data channels (4 x RS-232 and 2 x RS-485 / 422 / TTL) in a single, compact PC / 104 form factor card.

- High quality digitized video
- Standalone, single card multiplexer with expansion capability
- Standard PC / 104 form factor
- Rugged design suitable for harsh environments
- Wide range of supported video and data formats
- CWDM expansion for high speed data links, such as HD-SDI, ECL and IEEE 1394

907-GBE

The Model 907 Gigabit Ethernet (GbE) media converter is a PC / 104 form-factor card that transfers Ethernet data at 1000 Mbps with low latency over a singlemode fiber.



- Low latency (no switch buffer delays)
- Compatible with 10 / 100 / 1000 Mbps copper links per IEEE 802.3
- Replaceable SFP transceivers
- Provides fastest response for time critical links
- Backwards compatible with older 10 / 100 Mbps links
- Supports a wide range of optical options including CWDM for combining up to 8 separate GbE links on a single fiber

907V

The Model 907V video multiplexer provides digital transmission over a singlemode optical fiber for 6 high quality video channels (NTSC / PAL, RGB, Y / C, YPrPb formats) in a single PC / 104 form-factor card.

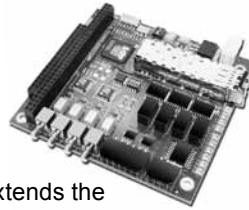


- Highest density of high quality video channels available in PC / 104 size
- Video only mode operates on a single wavelength
- Advanced diagnostics available in serial and Ethernet format

- Compatible with existing 907 expansion cards and media converters
- Replaceable SFP transceiver

907 Plus Media Converter

The 907 Plus is a singlemode multiplexer that extends the capabilities of standard 907 motherboards with an added video channel, galvanically isolated data channels, and a comprehensive, integrated diagnostics network.



- Available as a pressure tolerant model, rated for 3000 or 6000 PSI
- Ethernet diagnostics daughtercard available with standard Graphical User Interface (GUI) or Microsoft.NET library for customer GUI development
- Replaceable SFP transceiver with built-in diagnostics
- Higher data bandwidth available versus standard 907
- I2C bus supports diagnostic communications with expansion cards and media converters
- Galvanically isolated serial data channels

907 Multiplexer Card Options

The rugged 907 video / data multiplexer system provides transmission of multiple video and data channels through a single optical fiber. These low-power multiplexers are available in a compact PC / 104 form factor. Standalone motherboards feature three high quality video channels and six serial data channels. For more advanced requirements, expansion cards and media converters may be stacked on the motherboards to provide modular systems that can be easily configured for many applications.

912

Low latency OEO converter provides a range of options for repeating optical data signals, converting them to other optical or electrical formats or combining multiple fibers onto a single fiber via Coarse Wavelength Division

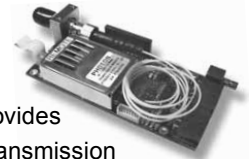


Multiplexing (CWDM). The 912 employs high reliability design and production processes, including environmental stress screening to ensure long life, even in harsh environments.

- Modular design
- Wide range of supported data formats
- Basic link diagnostics
- 20 year design life
- Easy extension of maximum distances for standard optical telemetry equipment
- Reduced number of fibers required in cables and rotary joints
- Increased optical power budgets and robustness of optical links

914

The 914 video / data multiplexer provides digital fiber optic transmission for 1 high quality video channel and 4-6 bidirectional data channels in the industry's smallest package.



- Standalone, single card multiplexer in a small profile
- High speed RS-484 / 422
- Expansion port for 2 extra data channels
- High quality digitized video with bidirectional option
- Singlemode and multimode bidirectional transceivers
- Integrated ST fiber bushing for external connection

Electro-Optic Systems (Twist-Capsule)

The dramatic increase of sophisticated gimbaled electro-optic sensor systems that provide battlefield information has led to major developments in supporting hardware. These EO systems require an enormous amount of data to be transmitted across the rotating axis as well as power and other signals.

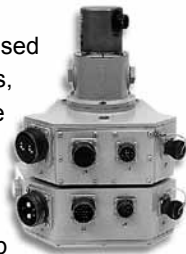


- Multiple contact technologies suited for the application

- Environmental sealing
- EMI shielding
- FEA structure analysis
- High shock and vibration capabilities
- Wide operating temperature envelope
- Vertical integration of position sensors and ancillary products
- High frequency bandwidth
- High reliability
- Redundant bearing designs

Vehicular Slip Rings

Electrical slip rings are used in vehicles such as tanks, retrievers, mobile missile launchers, LAVs and armored personnel carriers. A typical vehicle might contain slip rings in the turret, the commander station and the infrared sight.



- Supports modern data communication technologies
- Environmental sealing
- EMI shielding available
- Range of operating voltages compatible with any vehicular system
- Hydraulic rotary joint options
- Gold-on-gold contacts for signal and data integrity
- High shock and vibration capabilities
- High frequency coax channels
- Filtered air transfer for chemical, biological and radiological (NBC) requirements and / or electronics cooling and pneumatic rotary joint options for crew station breathing and electronic cooling
- Vertical integration with resolvers, fiber optics, fluidic interfaces, hydraulics, pneumatics and motors

Helicopter Slip Rings

Slip rings are typically used in de-icing and blade-folding systems and main and tail rotors. Instrumentation and data transfer capabilities are available



and standard on many designs.

- Multiple contact technologies suited for the application
- Environmental sealing
- EMI shielding
- FEA structure analysis
- High shock and vibration capabilities
- Wide operating temperature envelope
- Vertical integration of position sensors and ancillary products
- High frequency bandwidth
- High reliability and life
- Redundant bearing designs

Propeller Slip Rings

Fixed wing propeller aircrafts use special de-icing slip rings to pass electrical power from the airframe generators to the rotating propellers. These propellers are heated to avoid the build up of ice either in flight or on the ground in difficult weather conditions.



- Low brush wear
- Integrated rings and housings
- Beryllium free design
- Low maintenance solution, replaceable brushes
- Diamond turned finish on the slip ring

Miniature Slip Ring Capsules

Miniature slip ring capsule assemblies economically address both critical space and weight limitations. Each assembly includes the rotor, brush blocks, frame, ball bearings and dust cover.



AC264 / AC267

- Rugged stainless steel housing
- Up to 60 rings can be packaged in a self-contained envelope
- Gold-on-gold sliding contact technology
- Speeds up to 100 rpm
- Low noise
- Long life

AC6292

- Center-to-center adjacent ring spacings
- 80 rings packaged in a self-contained envelope 3.3 inches long and 1.5 inch barrel diameter
- Gold-on-gold sliding contact technology
- Up to 40 rpm operation
- Low noise
- Long life



RK4288

- Center-to-center adjacent ring spacings as small as 0.015 inch can be obtained
- 95 rings packaged in a self-contained envelope 3.3 inches long and 1.5 inch barrel diameter
- Gold-on-gold sliding contact technology
- Up to 40 rpm operation
- Low noise
- Long life



M-Series

- Ideal for limited space applications
- Modular construction for up to 120 circuits
- All circuits 60 V / 2 A each
- Continuous bidirectional rotation up to 1,000 rpm
- Dust-proof cover standard
- Flange mounting
- Superior signal quality
- 24 inch flying leads, optional wiring and harnessing available
- #26 AWG lead wire



Marine & Energy

From design to deployment, our experienced team of professionals specializes in providing custom electrical slip rings, fiber optic rotary joints, hydraulic utility swivels and fiber optic multiplexer solutions for the worldwide marine industry. Product features include hybrid packages that combine fiber, electrical, and fluid rotary joints, packaging for harsh environments, explosion-proof / flameproof for hazardous locations, and adaptation to customer's size and mounting constraints.

Electrical Slip Rings

Model 129

The Model 129 is a power slip ring used in marine and industrial applications worldwide. When rugged environments demand reliable, continuous operating performance, the 129 is the slip ring of choice. Capable of transmitting up to 5,000 volts and 175 amps per slip ring pass, the 129 can reliably transfer power across a rotating interface.

- Stainless steel housing provided for rugged environments
- Hazardous area certification available
- Power and signal transfer integrated into a single unit



Model 159

The Model 159 is the solution for higher current applications. Designed to accommodate up to 660 amps total current, the 159 can be customized to fit specific requirements. Incorporating both power and signal transfer into a single unit provides the needed versatility



for marine, industrial, and defence applications.

- Stainless steel housing for rugged environments
- Slip ring design provides sealing to IP66 requirements
- Can accommodate a variety of wire and cable types
- Hazardous area certification available
- Power and signal transfer integrated into a single unit

Model 176

Comprised of power and signal electrical passes, the 176 provides superior performance and reliability in demanding operating environments. Highly configurable, the 176 can be customized to meet customer specific needs.



- Stainless steel for open deck use
- Sealed housing design tested to IP66 standards
- Can accommodate a variety of wire and cable types
- Hazardous area certification available
- Reliable operation under shock and vibration

Model 180

Ideal for small systems, the Model 180 is a rugged unit designed for harsh operating conditions. For the hazardous area environment, the 180-X is a fully certified flameproof enclosure. When underwater operational capability is required, the 180 can also be adapted for use as a fluid filled pressure compensated unit. Available in both standard lengths or custom designs.



- Stainless steel for open deck use
- Sealed housing design tested to IP66 standards
- Can accommodate variety of wire and cable types
- Hazardous area certification available
- Reliable operation under shock and vibration
- Compact

FPSO Swivels

250

We design, manufacture and deliver unique FPSO swivels to meet the demanding requirements of offshore operators worldwide. Typically comprised of electrical slip rings, hydraulic utility swivels and fiber optic rotary joints, swivels are used in a variety of Floating Production, Storage and Offloading (FPSO) Systems including buoys, turret moorings and offshore loading towers.



- Stainless steel construction standard
- Large hollow bores
- Flameproof or purged / pressurized
- Integral junction boxes available
- Fluids for hydraulic control and chemical injection
- Single and multimode fiber
- Wide variety of cable entry methods

295-X

The 295-X is a standardized electrical / optical slip ring designed for the offshore oil industry. Available in sizes ranging to a maximum overall length of approximately 140 inches (3.5 m) and overall diameter of 12 inches (300 mm), this model meets the needs to transfer utility power, electrical and optical signals on a variety of offshore swivel applications.



- 316 stainless steel housing available for corrosion resistance
- Hazardous area certified in accordance with European Community ATEX directive 94 / 9 / EC
- Standardized design can accommodate variety of cable entry methods

Fluid Rotary Unions

Our fluid rotary unions are currently used around the world to ensure reliable transmission of life support, process, power and control fluids. Currently, fluid rotary unions rated for pressures up to 15,000 psi (1,000 bar) are available.

Model 70

- Configurable with up to 12 ports as standard
- 1/4, 1/2, 5/8, 1 inches SAE straight thread o-ring ports standard
- Corrosion resistant materials suitable for hot sea water and other harsh chemicals
- Rated to 1,000 psi [68 bar] at 10 rpm continuous service
- Maximum speed 30 rpm intermittent
- Polymer bearings eliminate the need for periodic service
- Optional rolling element bearing design available
- Available with hollow bore for ESR / FORJ pigtails



Model 301

- 1-1/2 inch body O.D. to mount AC4598 / AC6200
- Optional torque arm (required for L.H. rotation) matches AC4598 / AC6200 torque arm allowing a single anti-rotation interface
- 1 pass with 1/2 inch BSPP ports
- Rated to 145 psi [10 bar] at 250 rpm continuous service
- Maximum working pressure 180 psi [12.5 bar]
- Maximum recommended speed 2,000 rpm (intermittent or with sufficient medium flow to cool assembly)
- Optional IP65 seal available
- Stainless steel version available as special order



Model 306

- 1-1/2 inch through bore
- Pigtail channels integral to shaft
- 1 pass with 1/2 inch BSPP ports



- Rated to 145 psi [10 bar] at 100 rpm continuous service.
- Maximum working pressure 4000 psi [275 bar]
- Maximum recommended speed 450 rpm (intermittent or with sufficient medium flow to cool assembly)
- 1/2-13 UNC-2B thread for torque arm
- Optional ESR drive pin matches AC4598 / AC6200 torque arm allowing a single anti-rotation interface
- Optional ESR mount for AC4598 / AC6200 leaves reduced bore clear
- Stainless steel version available as special order

Model 307

- 2x 11/32 inch through bores
- Pigtail channels integral to shaft
- 2 pass with 1/8 inch BSPT ports
- Rated to 145 psi [10 bar] at 200 rpm continuous service
- Maximum working pressure 500 psi [34 bar]
- Maximum recommended speed 1,500 rpm (intermittent or with sufficient medium flow to cool assembly)
- 1/4-20 UNC-2B thread for torque arm
- Optional mounts available for various ESR and FORJ
- Stainless steel version available as special order



Fiber Optic Multiplexers

903

903 multiplexers provide highly reliable fiber-optic transmission of video and data signals in demanding environments. A modular Eurocard design and a wide range of supported video and data formats ensure the flexibility needed for easy system configuration.

- Compact, modular, 3U sub-rack
- Highest quality digitized video



- Wide range of supported video and data formats
- Robust protection on I / O lines
- Singlemode and multimode fiber options
- Automatic fiber switching option
- Extensive diagnostics monitors power system, video, data, temperature and fiber optic link

903HD

The High Density 903HD remote module provides the features of a full-sized subsea video/ data multiplexer in a package of half the volume. This reduction enables installation in constrained spaces while supporting transmission of 4-8 high quality video channels and 8-16 bidirectional data channels over a single optical fiber. Since the 903HD uses the same fiber multiplexer boards (FMBs) as the standard 903, including CWDM versions, it supports singlemode or multimode fiber as well as dual fiber operation with automatic fiber switching. Data channels are easily reconfigured with plug-in modules for various data formats. A standard 903 console module at the surface includes powerful diagnostics software with real-time display and logging of critical remote / console parameters.



- Less than half the size of the standard 903
- Wide range of supported video and data formats
- Highest quality digitized video
- Singlemode and multimode fiber options
- Extensive diagnostics monitors power system, video, data, temperature and fiber optic link

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