



Fiber-optic & Electric Rotary Joint

User Manual

Version 1.0.2

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Overview

1.1 Fiber-optic & Electrical Rotary Joint

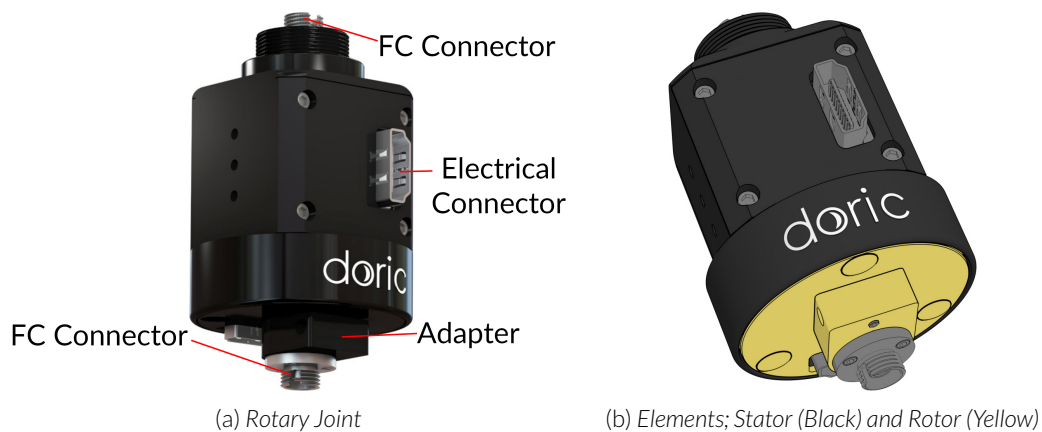


Figure 1.1: Fiber-optic & Electrical Rotary Joint

The Doric *Fiber-optic & Electrical Rotary Joint* (Fig. 1.1a) is a low-torque hybrid rotary joint that allows transmits rotation insensitive electrical and optical signals. It is composed of a **Stator**, which stays immobile, and a **Rotor** that moves (Fig. 1.1b). This product is used with FC optical connectors and a choice of Male Harwin (6 or 12 contacts) or Female HDMI (standard or Blackrock pinout) electrical connectors.

1.2 Holders and Accessories

The rotary joint comes standard with the *Holder_FRJ_large* (Fig. 1.2a). The gimbal mount *GH_FRJ* (Fig. 1.2b) can be purchased separately. A horizontal cable holder (Fig. 1.2c) can be purchased to keep cables off-center and increase effective torque applied to the rotor. The *Fiber-optic & Electrical Rotary Joint* is pre-installed with the adapter of the horizontal cable holder.



Figure 1.2: Fiber-optic & Electrical Rotary Joint Holders

1.3 Rotary Joint Harwin 12/Omnetics PZN12 Adapter Kit

To integrate the rotary joint within electrophysiology systems that use **Omnetics PZN-12 connectors**, an adapter kit can be provided. These elements allow a Harwin-connectorized rotary joint to serve as a rotary joint for Omnetics connectorized systems. The adapter system is composed of the following elements.

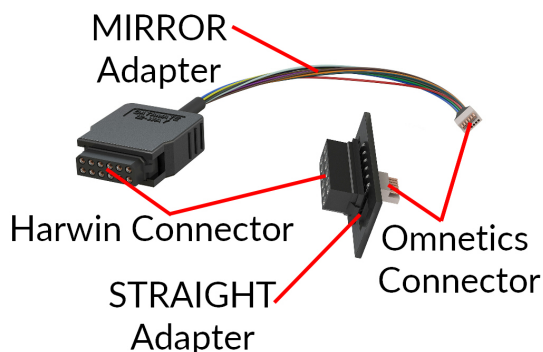


Figure 1.3: Harwin-Omnetics Adapters and Parts

- The **MIRROR Adapter** is a cable with a **Female Harwin 12-pin connector** on one side and a **Omnetics PZN12 connector** on the other. To use, simply insert the Female Harwin connector in the Male Harwin connector on the **Stator** side of the rotary joint. The pinout inside this adapter is mirrored to take into account the connector mirroring in a **Omnetics PZN12/Omnetics PZN12** cable.
- The **STRAIGHT Adapter** is a simple **Female Harwin 12-pin connector/Omnetics PZN12 connector** adapter. To use, simply insert the Female Harwin connector in the Male Harwin connector on the **Rotor** side of the rotary joint.



Figure 1.4: Adapters Connected to AHRJ (example), STRAIGHT on Rotor (yellow) and MIRROR on Stator (black)

Operations Guide

2.1 Rotary Joint Holders

2.1.1 Holder_FRJ_large

The *Holder_FRJ_large* allows fixed usage of the rotary joint. Simply thread the rotary joint into the holder as shown in Fig. 2.1. Ensure the stability of the joint in the thread to avoid slippage during use. The holder can then be secured in a setup using 1/4 (or M6) screws and nuts.

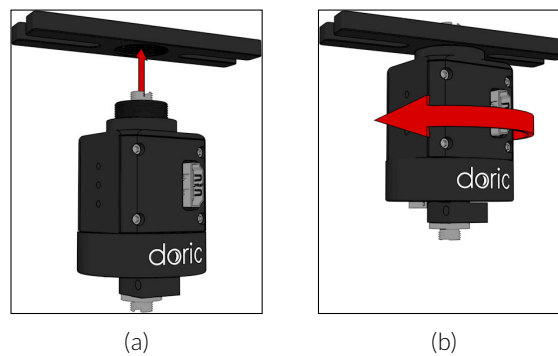


Figure 2.1: *Holder_FRJ_large* Installation

2.1.2 Gimbal Holder

The *GH_FRJ* (Fig. 2.2) allows swivel movement of the rotary joint along 2 axes. The rotary joint is to be threaded into the holder (Fig. 2.2) in the same way as with the standard holder. Ensure the stability of the joint in the thread to avoid slippage during use. The holder can then be secured in a setup using 1/4 (or M6) screws and nuts.

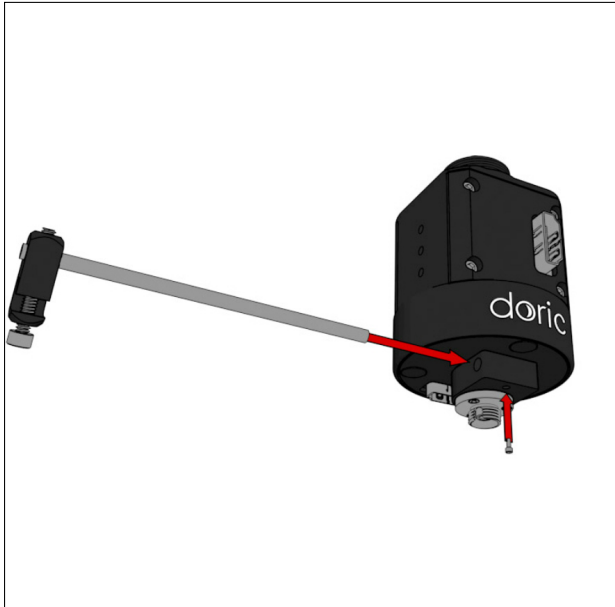


Figure 2.2: HRJ in the *GH_FRJ*

2.1.3 Horizontal Cable Holder

This holder is used to facilitate rotation by increasing the torque provided by the cable. When using the *Horizontal Cable Holder*:

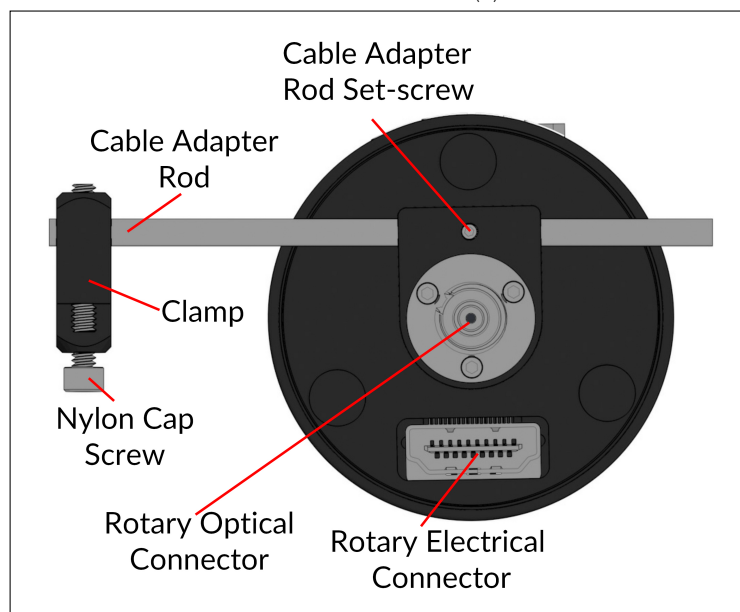
1. Slide the horizontal cable holder into the cable adapter, with its clamp facing down (Fig. 2.3a). The rod is held in place using a 2-56 set-screw on the underside of the adapter.
2. Secure the clamp (facing down) onto the cable adapter rod using a #4-40 nylon set-screw.
3. Loop the electrical cable into the clamp, and secure it using a #4-40 nylon socket head cap screw (Fig. 2.3b). This allows increased torque on the rotary joint when the clamp is displaced from the center of rotation.



(a) Horizontal Cable Holder Installation



(b) Horizontal Cable Holder Cable Placement



(c) Fiber-optic & Electrical Rotary Joint Underside

Figure 2.3: Horizontal Cable Holder Standoff Placement

2.2 Connectors

The **Fiber-optic & Electrical Rotary Joint** has two different types of connectors, optical and electrical. There are two connectors for each type, requiring a signal cable/patch cord (connecting to a console, computer or other signaling device) and a subject cable/patch cord (connecting to the experimental subject or device).

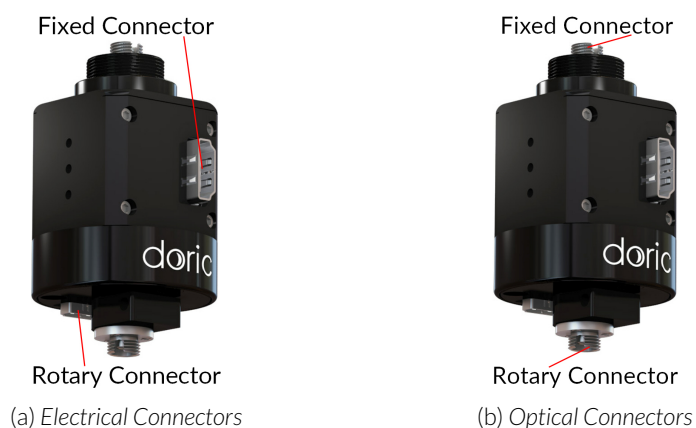


Figure 2.4: Rotary Joint Connectors

2.2.1 Electrical Cables

Ensure that the electrical connectors are free of dust using an air duster before installing the cables. When not in use, install plastic caps on connectors for protection and cleanliness.

- Connect the signal electrical cable to the fixed electrical connector (Fig. 2.4a).
- Connect the subject electrical cable to the rotary connector (Fig. 2.4a).
- The subject electrical cable can be looped into the **Clamp** (Fig. 2.3b) to provide extra torque. The cable is secured using a #4-40 nylon socket-head cap screw.

2.2.2 FC Connector Installation

1. Clean the optical fiber connector before insertion. Use isopropanol and a lint-free wipe.
2. With an FC connector, the connector key must be oriented to enter within the receptacle slot to ensure proper connection (Fig. 2.5).

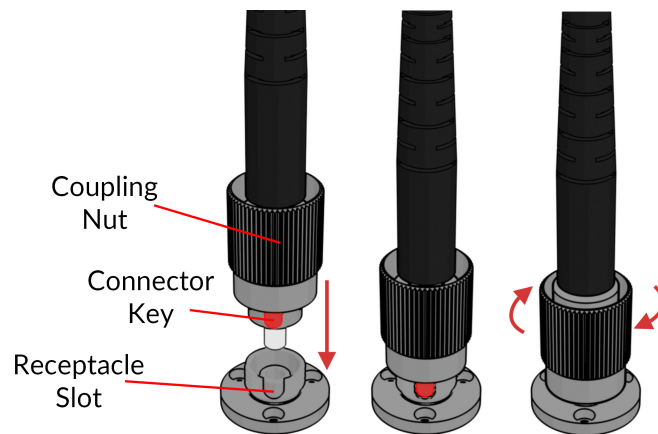


Figure 2.5: FC connector, Fiber Installation

⚠ To reduce the risk of eye injury, **it is sound practice to NOT CONNECT/DISCONNECT OPTICAL FIBERS when the light source is turned on.**

Specifications

Table 3.1: Harwin Electrical Connector Configuration

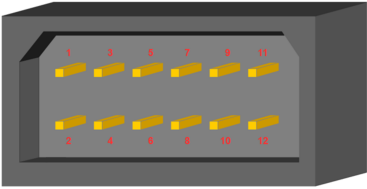

Male (on rotary joint)	Female (on adapter)
	

Table 3.2: HDMI Electrical Connector Configuration

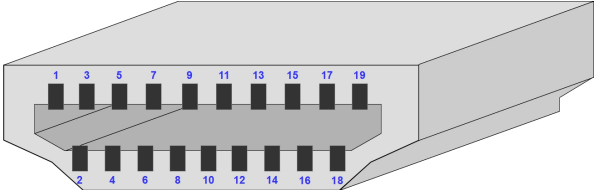
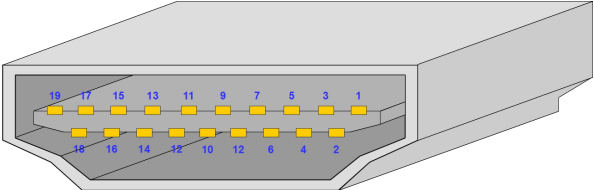
Male (on cable)	Female (on rotary joint)
	

Table 3.3: HDMI Electrical Connector Pinouts

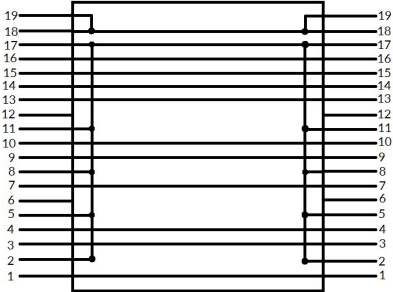
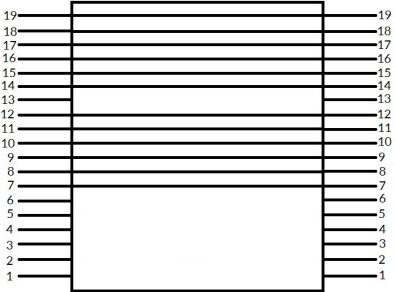
HDMI Microscope	HDMI Blackrock 2
	

Table 3.4: General Specifications

SPECIFICATIONS	VALUE	NOTES
Transmission	80%	200 μ m core NA 0.22 Optical fiber
Maximum Variation	2%	200 μ m core NA 0.22 Optical fiber
Wavelength Range	450-650 nm	Others available on request
Start Up Torque	0.9 mN·m	For 6 contacts, Typical Value
	1.8 mN·m	For 12 contacts, Typical Value
Input NA	0.22	-
Output NA	0.22	-
Fiber Type	200 μ m core NA 0.22	-
HDMI (Female) connector pinout type	Microscope, Blackrock 2	-
Harwin (Male) connector type	Datamate L-Tek serie	2 mm pitch, 12 contacts, 2 rows
Number of contacts	12	-
Contact Material	Gold	-
Maximum Current	2 A per contact	-
Contact Resistance	<500 m Ω	-
Resistance Variation During Rotation (constant rotation)	<100 m Ω @ 5 VDC	-
Rotation Speed	up to 300 rpm	-
Outer diameter	45.0 mm	-
Length	59.4 mm	-
Mass	123 g	-

Table 3.5: Recommended Environmental Specifications

DESCRIPTION	OPERATION	STORAGE
Use	Indoor	Indoor
Temperature	0-40 ° C	0-40 ° C
Humidity	40-60% RH, non condensing	40-60% RH, non condensing

Support

4.1 Maintenance

The product does not require any maintenance. Do not open the enclosure. Contact Doric Lenses for return instructions if the unit does not work properly and needs to be repaired.

4.2 Warranty

This product is under warranty for a period of 12 months. Contact Doric Lenses for return instructions. This warranty will not be applicable if the unit is damaged or needs to be repaired as a result of improper use or operation outside the conditions stated in this manual. For more information, see our [Website](#).

4.3 Contact us

For any questions or comments, do not hesitate to contact us by:

Phone 1-418-877-5600

Email sales@doriclenses.com

The Doric logo consists of the word "doric" in a lowercase, sans-serif font. The letter 'o' is stylized with a white highlight on its upper left curve, giving it a three-dimensional appearance.

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