

ROTARY LINK CONNECTOR®

Non-Contacting Opto-Electronic Rotary
Connector for High Data Rate **Signal**
Transmission & **Power** Supply
thru **Rotational** Interfaces

Reliable link for moving platforms
www.nmg-interconnect.com



Engineering Challenges

It has been an engineering challenge to design connectors in a way that they can transmit signals and supply power between sections, when one of them is continuously rotating.

And nowadays advanced systems require the transmission of higher data rate signal and/or power supply through a moving interface.

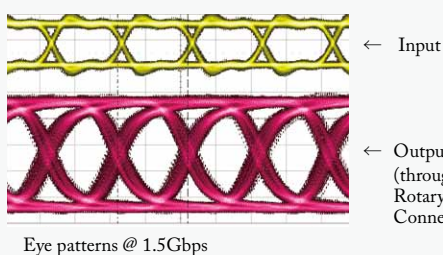
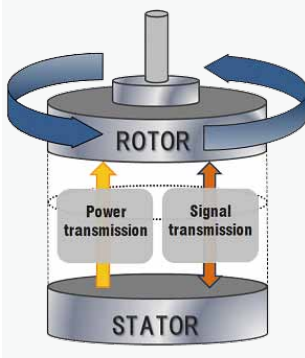
The challenge is to establish a stable, secure, and reliable interconnection in terms of quality and higher data rates, even when thousands of rotations per minute are required.

Another common challenge is to ensure a long product life and reliability that is hard to achieve due to constant mechanical friction of the rotating parts. There are different technologies available in the market trying to tackle these engineering challenges. High precision cables, slip rings for data and power or fiber optical joints to mention some of the most commons.

All the solutions have their advantages and disadvantages. Especially in terms of noise, signal quality, data rates, life time, size, degree of integration and cost performance. These technologies differ extremely from each other, which makes it difficult for customers to find a right solution to fulfill their needs.



Opto-Electronic signal transmission & inductive power supply through a moving interface with no contacts.

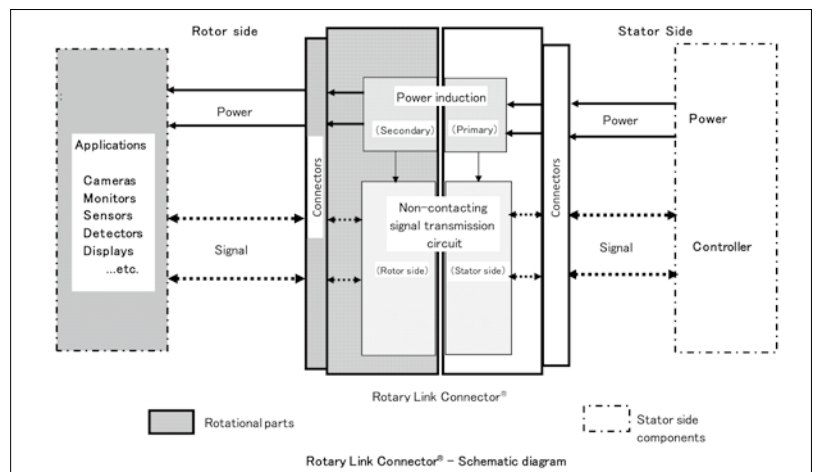


Rotary Link Connector® : "Non-Contacting" Opto-Electronic Slipping

Rotary Link Connector®(RLC®) is an opto-electronic interconnect device for signal transmission and power supply thru rotational interface allowing 360 degree rotation between a stator and a rotor section.

For signal transmission, the device uses our patented optical-electronic transmission technology, and the technology enables non-contacting, high data rate signal(s) transmit through a rotational interface without any noise or friction which usually come from rotational movement and/or accumulated rotations.

For power supply, an advanced power inductive technology is used to transmit power from the input to the output with no physical contacts. Integrating all these advanced technologies, Rotary Link Connector® enables its users to create a highly reliable rotational interconnection in their systems.



Key Features

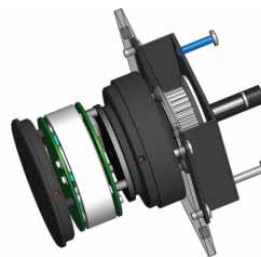
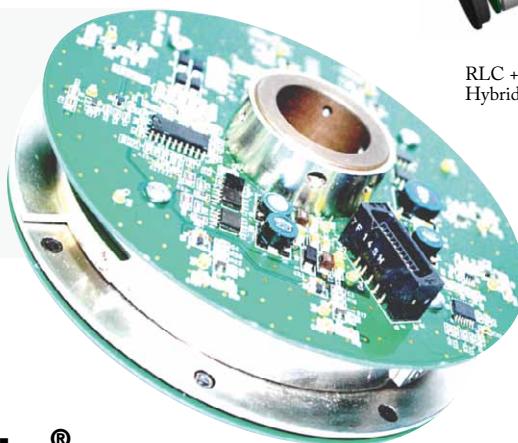
- Bi/Uni-directional high data rate signal transmission
- No O/E, E/O converters required to connect
- Reliable EMC performance
- No wear or tear (brush-less structure)
- Compact size
- Maintenance free
- Ethernet*, Gigabit Ethernet*, HD-SDI compatible (*supplied with media converter boards)
- High speed rotation : >6,000 rpm continuous (*Rotation speed differs by models. Please contact our sales for details and higher rotation speed.)

Customization

Design & Engineering According to Customer Requirements

More electrical power transmission, multiple data lines or special housing design for specific environmental requirements, a wide variety of customizations are possible such as...

- Multi channels
- Hollow design
- Higher data rates
- Higher power supply
- Environmental sealing
- Combination w/ sliprings
- Supply w/ cable assemblies



RLC + Slipring Hybrid Solution



Customized housing for a Gyro Stabilized Gimbal

Rotary Link Connector® for 1000 BASE-T Gigabit Ethernet

Today ethernet links are widely used in different fields of applications such as robotics, automation, sensor systems...etc. RLC-3-55-GbE model is fully compatible to the integration of Gigabit Ethernet connection through a rotational interface. This "Non-contacting" opto-electronic rotary interconnect device can eliminate all those wirings while maintaining stable and reliable signal transmission without degradation.



RLC-3-55-GbE



Gigabit Ethernet Media Converter boards

Applications

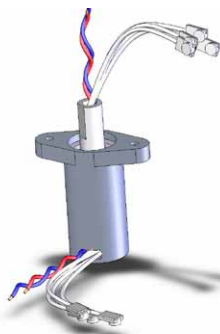
Systems requiring data transmission & power supply through rotational interface can be found everywhere in both hi & low profile platforms. Thanks to its reliable design, Rotary Link Connector® is most suitable for applications in the fields of security / surveillance systems, robotics, and automations, where stable, secure and smart link of signals is indispensable to mission-success.

- Security / Surveillance Systems
- Radars and Sensor Systems
- Robotics
- Automation
- Motion Simulation Rate Tables



Standard Models : Signal Transmission

microRLC-12-2.5G



Interface & Data Rate		
High data rate signal transmission	No. of channels	Bi-directional 1 channel Stator ⇔ Rotor
	Data rate	500Mbps~2.5Gbps
	Signal level	LVDS
Power input(*1)		3.3V +/-5%
Mechanical		
Dimensions(dia.× h)(mm)		12 × 20(excl. center shaft)
Weight		<15g
Rotation speed		<100rpm
Environmental		
Temperature range		-40/+85 degC
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dimensions		

RLC-3W-34-1.5G-38.4K

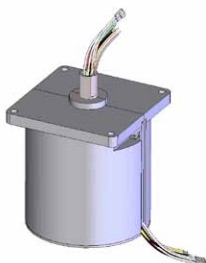


Interface & Data Rate		
High data rate signal transmission	No. of channels	Uni-directional 1 channel Rotor ⇒ Stator
	Data rate	155Mbps~1.5Gbps
	Signal level	CML
Low data rate signal transmission	No. of channels	Bi-directional 1 channel Stator ⇔ Rotor
	Data rate	38.4kbps
	Signal level	LVC MOS
Power input(*1)		DC12V or DC24V +/-5%
Mechanical		
Dimensions(dia.× h)(mm)		34 × 31.5(excl. center shaft)
Weight		<55g
Rotation speed		100rpm
Environmental		
Temperature range		-20/+60 degC
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dimensions		

(*1)the power is required to operate a RLC.

Standard Models : Signal & Power Transmission / Gigabit Ethernet & Ethernet

P/N: RLC-3-55-GbE
1000BASE-T Gigabit Ethernet



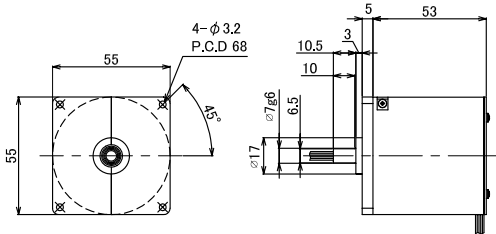
A couple of Gigabit Ethernet media converter boards supplied together w/ RLC-3-55-GbE

Interface & Data Rate		
Signal transmission	Standard	1000BASE-T
	Data rate	1Gbps
Power input(*1)		DC12V - 24V
Power Transmission		
Input		DC12V
Output		DC12V 0.85A(10W)
Mechanical		
Dimensions(dia.× h)(mm)		55×58(excl. the center shaft)
Weight		<350g(incl. two media converters)
Rotation speed		100rpm
Environmental		
Temperature range		-20/+60 degC
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dimensions		

P/N: RLC-3-55-100MLAN
Compatible w/ 100BASE-TX Ethernet



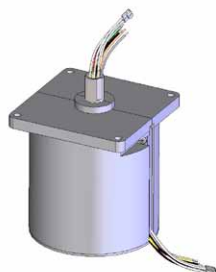
A couple of Ethernet media converter boards supplied together w/ RLC-3-55-100MLAN

Interface & Data Rate		
Signal transmission	Standard	IEEE802.3 10BASE-T IEEE802.3U 100BASE-TX
	Data rate	10Mbps/100Mbps
Power input(*1)		DC12V - 24V
Power Transmission		
Input	DC12V	
Output	DC12V 1.3A(16W)	
	DC5V(for media converters)	
Mechanical		
Dimensions(dia.× h)(mm)		55×58(excl. the center shaft)
Weight		<340g(incl. two media converters)
Rotation speed		100rpm
Environmental		
Temperature range		-20/+60 degC
Sealing		IP5X
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dimensions		
		

(*1)the power is required to operate a RLC.

Standard Models : Signal & Power Transmission / 1.5Gbps Transmission for True HD

P/N: RLC-3-55-1.5G



Interface & Data Rate		
High speed signal transmission	No. of channels	Uni-directional 1ch Rotor ⇒ Stator
	Data rate	155Mbps~1.5Gbps / differential Input/Output
	Signal Input level	0.2 - 2.4Vp-p / Impedance 75ohm
Low speed signal transmission	Signal Output level	0.4 - 0.8Vp-p / Impedance 50ohm
	No. of channels	Bi-directional 1ch Rotor ⇔ Stator
	Data rate	1Mbps
	Signal level	3.3V - LVCMOS
Power Supply & Consumption Performance		
Input Voltage		+12V +/-5%
Output Voltage / Current Rating		+12V +/-5%/1.3A (15W)
Power Consumption(*1)		<100mA
Mechanical		
Dimensions(dia.x h)(mm)		55x58(excl. the center shaft)
Weight		<300g
Rotation speed		100rpm
Environmental		
Temperature range		-20/+60 degC
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dust proof		IP5X
Dimensions		

P/N: RLC-3-38-1.5G



Interface & Data Rate		
High speed signal transmission	No. of channels	Uni-directional 1ch Rotor ⇒ Stator
	Data rate	155Mbps~1.5Gbps / differential Input/Output
	Signal Input level	0.2 - 2.4Vp-p / Impedance 50ohm
Low speed signal transmission	Signal Output level	0.4 - 0.8Vp-p / Impedance 50ohm
	No. of channels	Bi-directional 1ch Rotor ⇔ Stator
	Data rate	1Mbps
	Signal level	3.3V - LVCMOS
Power Supply & Consumption Performance		
Input Voltage		+12V +/-5%
Output Voltage / Current Rating		+12V +/-5%/1.3A (15W)
Power Consumption(*1)		<100mA
Mechanical		
Dimensions(dia.x h)(mm)		38x53(excl. the center shaft)
Weight		<300g
Rotation speed		100rpm
Environmental		
Temperature range		-20/+60 degC
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dust proof		IP5X
Dimensions		

(*1)the power is required to operate a RLC.

Standard Models: Signal & Power Transmission / φ34 + 10W POWER & CC-LINK

P/N: RLC-3-34-1.5G-38.4K+10W



Interface & Data Rate		
High speed signal transmission	No. of channels	1ch Rotor ⇒ Stator
	Data rate	155Mbps~1.5Gbps
	Signal level	CML
Low speed signal transmission	No. of channels	Bi-directional 1ch Stator ⇔ Rotor
	Data rate	38.4kbps(MAX)
	Signal level	LVC MOS
Power input(*1)		DC12V - 24V
Power Transmission		
Input		DC12V
Output		DC12V 0.85A(10W)
Mechanical		
Dimensions(dia.× h)(mm)		34×31.5(excl. the shaft)
Weight		55g+70g(10WPowerUnit)
Rotation speed		100rpm
Environmental		
Temperature range		-20/+60 degC
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dimensions		

P/N: RLC-3-55-CL
CC-LINK compatible



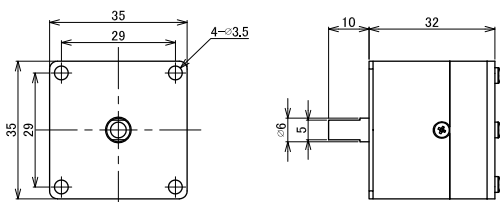
Interface & Data Rate		
Signal transmission	Standard	CC-LINK Ver. 1.10 CC-LINK Ver. 2.0
	Data rate	156kbps - 10Mbps
Power Transmission		
Input		DC12V
Output		DC12V 0.63A
Mechanical		
Dimensions(dia.× h)(mm)		55×66.5(excl. the center shaft)
Weight		300g
Rotation speed		100rpm
Environmental		
Temperature range		-20/+60 degC
Sealing		IP5X
Vibration		10Hz ~ 2000Hz 147m/s ²
Shock		294m/s ² 11ms
Dimensions		

(*1)the power is required to operate a RLC.

Non-Contacting Power Supply Unit

P/N: RLC-P-10W-12V
(or 24V)



Interface	
Power input(*1)	DC12V or 24V +/-5%
Power Transmission	
Input	DC12V or 24V +/-5%
Output	10W (DC12V or 24V) 3.3V/0.1A for micro RLC
Mechanical	
Dimensions(dia.× h)(mm)	35×32(excl. the center shaft)
Weight	49.5g
Rotation speed	100rpm
Environmental	
Temperature range	-25/+60 degC
Vibration	10Hz ~ 2000Hz 147m/s ²
Shock	294m/s ² 11ms
Dimensions	
	

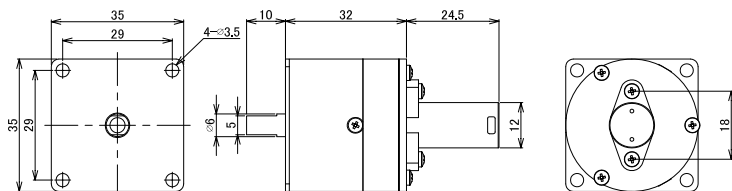
(*1)the power is required to operate a RLC.

Hybrid RLC / microRLC + Non-Contacting Power Supply Unit

The combination of a RLC® and a Non-Contacting Power Supply Unit is suitable for high data rate signal transmission and power supply thru a rotational interface. A RLC® can also be combined with a slipring for high volume of power supply is required. Please contact us for more details and design proposals according to applications.

P/N: HybridRLC-micro-10W



Interface		
High data rate signal transmission	No. of channels	Bi-directional 1 channel Stator ⇄ Rotor
	Data rate	500Mbps~2.5Gbps
	Signal level	LVDS
Power Transmission		
Input	DC12V or 24V +/-5%	
Output	10W (DC12V or 24V) 3.3V/0.1A for micro RLC(*1)	
Mechanical		
Dimensions(dia.× h)(mm)	35×32(excl. the center shaft)	
Weight	<65g	
Rotation speed	100rpm	
Environmental		
Temperature range	-25/+60 degC	
Vibration	10Hz ~ 2000Hz 147m/s ²	
Shock	294m/s ² 11ms	
Dimensions		
		

COMPANY PROFILE



Nihon Maruko International Group - Interconnect Solutions For “Mission Success”

Nihon Maruko International Group is a Japan based technology company specialized in development and manufacturing of interconnect solutions for aerospace, defense and industrial markets.

Established in 1978, today we are one of the most experienced companies in the Japanese market, having been supplying high quality interconnect systems. Our expertise broadens from MIL standard connectors, customized harness assemblies and connectors for defense systems to space qualified interconnections by JAXA (Japan Aerospace Exploration Agency).

For years, we have been building up expertise and core competencies focusing on developing new technologies to meet changing customers' needs. We are always willing to be a step ahead when it comes to creating new solutions and contributing to customer's “Mission Success”.

QMS Certifications:

ISO 9100:2009 Aerospace Quality Management System

ISO 9001:2008



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