



## Supporting Ongoing Robotic Innovation

**Exciting new opportunities** for greater proliferation of robotics in modern society are emerging all the time. Robots are now capable of performing a wide array of different tasks. They are revolutionising the factory floor, by dramatically boosting production throughput. In the form of collaborative robots (or cobots), they can work directly alongside humans in manufacturing facilities, as well as helping with the education of our children and providing care to the elderly.

Upholding the highest possible levels of operational reliability is, of course, paramount. Though robotic designs can be increasingly intricate and sophisticated, assuring reliability in maintained needs to be done right down at the component level. Every robotic system is dependent on the delivery of power to drive the

motors and actuators that enable its movement, plus the transportation of data from integrated sensors that allow it to respond to and interact with the surrounding environment. Connectors and cabling therefore have an important role to play.

Despite large quantities of money being spent on robotic system construction, when it comes to purchasing constituent connector components, engineers/procurement managers often simply go for commodity connectors from computer hardware suppliers. The perceived cost savings

are misjudged though. Downtime through connection failure can have heavy financial impact – with the production line in which the robot is situated remaining inactive while the cause of failure is identified and repairs undertaken.

Specifying high reliability (hi-rel) connectors and accompanying these with well-constructed cable assemblies means that such situations can be avoided.

### How Can Harwin Help with Implementing Robotic Designs?

Harwin offers an expansive range of hi-rel connectors, capable of coping with the most uncompromising of application settings – where exposure to shock, vibration and extreme temperatures are commonplace. They are backed up by a comprehensive cable assembly service, which allows customers to offload this difficult and problem-fraught work onto our

experienced engineering team. Unlike other suppliers, Harwin has no minimum order quantity for its cable assemblies. They can thereby be sourced in a cost effective manner with just the required number of units being paid for and no upfront tolling costs to worry about. Backpotting is offered as part of the cable assembly service package.

### Incorporating Harwin Connectors in Robotic Designs



**Gecko-SL** – Compact and lightweight, but still also ultra-rugged, these 1.25mm pitch connectors are optimised for high-density electronic deployments where available space is limited. Their robust construction and stainless steel screw-lok mechanism protects them from elevated levels of shock (50g) and vibration (20g/2000Hz). Furthermore, a -65°C to +150°C temperature range is supported. Each of the beryllium copper plated contacts has the capacity to deliver 2A of current.



**M300 Series** – These low-profile 3mm pitch hi-rel power components feature a 4-finger contact design that maintains connection integrity regardless high levels of vibration and shock. The current rating is 10A per contact, with 3-contact single row, plus 6-contact and 10-contact double row arrangements available. A 1000 mating cycle durability is supported.



**Mix-Tek** – Harwin's Mix-Tek product offering combines power and signal connection, in order to save valuable space within densely-packed electronic designs, such as robotics. The power contacts are rated up to 40A, while the signal contacts have a 3A rating. The connectors can accommodate up to power contacts and up to 12 signal contacts, with a wide array of different options covered.

# Specifying Connectors for Robotic Designs

The following matrix outlines the key factors involved in specifying suitable connectors for robotic designs. Using it will help you to focus on what it is important for your project and enable you to get the best match for your particular application criteria.

	Project Requirements	Supplier 1:	Supplier 2:	Supplier 3:
<b>Electrical Properties</b>				
Current rating / Maximum				
Voltage rating / Maximum				
Frequency				
EMI / EMC shielding				
Anti-Crosstalk properties				
Notes:				
<b>Mechanical and Environmental Considerations</b>				
Mechanical stress factors				
Shock				
Vibration				
Operating temperature range				
Humidity				
Substance exposure				
Connector mating cycles				
Plating material & thickness				
Notes:				
<b>Design</b>				
Mis-mating prevention features (polarisation / shrouded housing)				
Contact Exposure (hazardous voltages)				
Packaging type (e.g. tape & reel)				
Tooling				
PCB footprint / real estate				
Above-board space				
Misalignment				
Notes:				
<b>Standards and Certifications</b>				
RoHS				
REACH				
Conflict Minerals				
UL rated plastics				
Other:				
Notes:				
<b>Suppliers - Certification, Support &amp; Supply Chain</b>				
Certifications and standards (i.e. EN9100 / AS9100 C)				
Technical Support (i.e. free online resources, live help chat, samples)				
Evaluation product samples (i.e. samples for prototype build)				
Supply chain (i.e. global distributors)				
Stocked product, made-to-order or custom build				
Product end-of-life (EOL) or obsolescence notifications (i.e. last-time buy option)				
Notes:				