GAM Robotics Solutions
CAPABILITIES & PRODUCTS FOR

AGRICULTURE
ASSEMBLY
COLLABORATIVE
CONSTRUCTION
DEFENSE
FABRICATION
INSPECTION
LOGISTICS
MANUFACTURING
MEDICAL
SERVICE

JANUARY 2022

GAM Can.
The GAM Advantage
Find your exact solution at GAM!

GAM is a U.S.-owned manufacturing company in business for more than 30 years. We have one of the broadest product ranges in the market including products dedicated to the robotics and automation market.

GAM’s robotics product line offers every technology option from strain wave (harmonic) and cycloidal to our revolutionary zero-backlash planetary.

One of our greatest strengths is our ability to modify standard designs, provide completely customized solutions, and integrate product assemblies to meet your specific application requirements. And, because of our flexible manufacturing, we can cost-effectively produce small batches of customized product in short lead-times.

So if you can’t find what you are looking for, just ask!

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**Inline planetary gearbox with spline output shaft. External tie rods reinforce against reversing or shock loads.**

**Robot 7th axis: Dyne Series right angle hypoid gearbox with additional external bearing support and adjustable pinion shaft length. Eliminates in-house assembly. Just mount and go!**

**Standard GPL zero-backlash planetary gearbox in custom housing with integrated shrink disk connection. Works with any servo motor and output mounting. Drops in for competitive direct drive motors.**

**EPL planetary gearbox with custom geared PMK (parallel mounting kit) allows for offset motor, includes stub shaft for mounting an encoder at the output. Drives each wheel of an AGV (automated guided vehicle).**
### GAM Gearbox Range

GAM offers a full range of gearboxes from planetary servo gearboxes through zero-backlash robotic gearboxes for a wide variety of applications.

**INCREASING PRECISION - DECREASING BACKLASH**

<table>
<thead>
<tr>
<th>Features</th>
<th>Planetary EPL</th>
<th>Helical Planetary SPH</th>
<th>Cycloidal GCL</th>
<th>Strain Wave GSL</th>
<th>Robotic Planetary GPL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision Inline for general servo applications</td>
<td>High precision inline for demanding servo applications</td>
<td>Zero-backlash cycloidal Available with integral pre-stage</td>
<td>Zero-backlash strain wave with high torque density and small, lightweight design for easy integration</td>
<td>Zero-backlash planetary with the lowest backlash. Vibration-free for high positional accuracy.</td>
<td>Unique, revolutionary design maintains lifetime zero-backlash</td>
</tr>
<tr>
<td>Advantages</td>
<td>Shaft, hollow or flange output Very high ratio</td>
<td>Quiet operation</td>
<td>Available with integral pre-stage for higher ratios</td>
<td>Quiet operation Easy integration</td>
<td>Very high precision Quiet operation Smooth, vibration-free motion</td>
</tr>
<tr>
<td>Backlash:</td>
<td>≤ 8-20 arcmin</td>
<td>≤ 1 - 3 arcmin</td>
<td>≤ 1 arcmin</td>
<td>≤0.5 arcmin (≤30 arcsec)</td>
<td>≤0.1 arcmin (≤6 arcsec)</td>
</tr>
<tr>
<td>Integral pre-stage option for additional ratio</td>
<td></td>
<td>Integral pre-stage option for additional ratio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Life</td>
<td>30,000 hours</td>
<td>20,000 hours</td>
<td>6000 hours</td>
<td>7000-15,000 hours</td>
<td>20,000 hours</td>
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</tbody>
</table>

**Torque Range (Nm)**

<table>
<thead>
<tr>
<th>Torque Range (Nm)</th>
<th>Model</th>
<th>Nominal Torque (Nm)</th>
<th>Model</th>
<th>Nominal Torque (Nm)</th>
<th>Model</th>
<th>Nominal Torque (Nm)</th>
<th>Model</th>
<th>Nominal Torque (Nm)</th>
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<tbody>
<tr>
<td>≤15</td>
<td>EPL-F-047</td>
<td>14</td>
<td></td>
<td></td>
<td>GSL-CS-014</td>
<td>12.7</td>
<td>GSL-014</td>
<td>14</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GSL-HS-017</td>
<td>17</td>
<td>GSL-HS-020</td>
<td>20</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GSL-HS-025</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 - 25</td>
<td>EPL-F-064</td>
<td>42</td>
<td></td>
<td></td>
<td>GGL-HS-017</td>
<td>32</td>
<td>GGL-HS-040</td>
<td>40</td>
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<td></td>
<td></td>
<td>GGL-HS-032</td>
<td>40</td>
<td></td>
<td></td>
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<tr>
<td>26 - 50</td>
<td>EPL-F-090</td>
<td>100</td>
<td>SPH-F-075</td>
<td>100</td>
<td>GGL-CS-014</td>
<td>56</td>
<td>GGL-CS-062</td>
<td>248</td>
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<td>51 - 100</td>
<td>EPL-F-110</td>
<td>210</td>
<td>SPH-F-100</td>
<td>250</td>
<td>GGL-F-020</td>
<td>167</td>
<td>GGL-CS-025</td>
<td>124</td>
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<tr>
<td>101 - 250</td>
<td>EPL-F-140</td>
<td>340</td>
<td>SPH-F-140</td>
<td>450</td>
<td>GGL-F-080</td>
<td>784</td>
<td>GGL-F-096</td>
<td>445</td>
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<tr>
<td>251 - 500</td>
<td>EPL-F-140</td>
<td>450</td>
<td></td>
<td></td>
<td>GGL-F-080</td>
<td>770</td>
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<td>501 - 1000</td>
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<td></td>
<td></td>
<td></td>
<td>GGL-F-110</td>
<td>1078</td>
<td>GGL-F-160</td>
<td>1565</td>
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<tr>
<td>1001 - 2500</td>
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<td></td>
<td></td>
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<td>GGL-F-160</td>
<td>1565</td>
<td>GGL-F-224</td>
<td>1820</td>
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<tr>
<td>2501 - 5000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GGL-C-320</td>
<td>3136</td>
<td>GGL-F-300</td>
<td>2690</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GGL-C-450</td>
<td>4500</td>
<td>GGL-F-400</td>
<td>3505</td>
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</table>
GAM's product range of robotic and servo gear reducers, rack and pinion, linear mount products, couplings, and other specialized mechanical drive solutions is one of the largest in the industry.

Whether your robotic automation application requires a zero-backlash gearbox, you require a smooth path movement, or you’re building your own Cartesian robotic system, GAM has the products to meet your application needs.

Choose from our standard products or let us customize a solution for your application. With our flexible manufacturing, we can cost-effectively produce small batches in short lead times.

**Zero-Backlash Robotic Gear Reducers**

**GPL Series**
- The best performing zero-backlash gearbox on the market
- Backlash < 0.1 arcmin
- Vibration-free motion with high positional accuracy
- Backlash does not increase over life of gearbox, no adjustment necessary
- Precise, smooth path control, positioning, and repeatability

**GCL Series**
- Robotic inline cycloidal gearbox with high impact resistance
- Backlash < 1 arcmin
- Impact resistance 5x nominal torque withstands frequent start-stop impact loads
- Precise point-to-point motion
- Integral pre-stage options available

**GSL Series**
- Robotic inline strain wave (harmonic) gearbox
- Backlash < 0.5 arcmin
- Harmonic-type gearing for high accuracy
- Multiple configurations
- Drops in for popular competitor gearboxes

**SPH Series**
- High performance inline planetary helical gearbox
- Backlash < 3 arcmin
- Torque capacity up to 900 Nm
- Radial load capacity up to 20,000 N
- Shaft or flange output

**EPL Series**
- Performance inline planetary gearbox
- Backlash < 8 arcmin
- Torque capacity up to 340 Nm
- Radial load capacity up to 8,500 N
- Shaft, flange, or hollow output

**Dyna Series**
- High performance right angle hypoid gearbox
- Backlash < 2 arcmin
- Torque capacity up to 1,400 Nm
- Radial load capacity up to 20,000 N
- Shaft, flange, or hollow output

**Dyna-Lite Series**
- Performance right angle hypoid gearbox
- Backlash < 6 arcmin
- Torque capacity up to 140 Nm
- Radial load capacity up to 7,200 N
- Shaft or hollow output

**EPR Series**
- Performance right angle bevel planetary gearbox
- Backlash < 8 arcmin
- Torque capacity up to 340 Nm
- Radial load capacity up to 8,500 N
- Shaft, flange, or hollow output

**V Series**
- Performance spiral bevel right angle gearbox
- Backlash < 15 arcmin
- Torque capacity up to 4,640 Nm
- Radial load capacity up to 34,200 N
- Single shaft, dual shaft or hollow output

**High Precision Rack and Pinion Systems**

**Helical Rack & Pinion Systems**
- High precision helical rack and pinions for smooth quiet operation.
- Precision pinions designed specifically for GAM gearboxes for optimized linear system performance
- GAM rack available separately or as part of a gearbox/pinion system

**Precision Inline and Right Angle Gear Reducers**

**Distance Couplings**
- Drive shafts with lengths up to 20 ft
- Torque capacity up to 1,600 Nm

**Mounting Kits**
- Connect any motor or gearbox to any actuator

**EDC Series**
- Inline motor mounting kit

**WDS Series**
- Parallel mounting kit

**LSK**
- In-line motor mounting kit

**PMK**
- Parallel mounting kit
1. Collaborative Robot

- **GSL**
  - GSL robotic strain wave gearbox with <0.5 arcmin backlash

2. Tool Changer

- **GCL**
  - Robotic cycloidal gearbox with impact resistance of 5x nominal torque for frequent starts and stops

3. Cartesian System

   **Build your own**
   - with products designed specifically to simplify the process of designing and building your own Cartesian systems. Components are designed and manufactured to work with any actuator

   - **EPL-H**
     - Inline gearbox, with hollow output design for easy mounting to linear actuators

   - **WDS**
     - Bellows style distance couplings connect actuators without additional shafts

   - **GSL**
     - Theta (wrist) axis with strain wave gearbox. Can be supplied with motor mount and standard ISO output flange

   - **DL-DC**
     - Right angle Dyna-Lite gearbox with hollow output design for easy mounting to linear actuators. Includes output adapter tailored to the actuator

   - **PMK**
     - Parallel mounting kits save space by mounting the motor parallel to the ball-screw actuator
**Automated Guided Vehicle (AGV)**

- **GSL**
  Robotic inline strain wave gearbox with <0.5 arcmin backlash

- **EPL**
  Modified for demanding shock and reversing loads

- **Custom EPL**
  With integrated motor rotor for a compact drive

**Delta Robot**

- **SPH-F**
  Inline helical gearbox with <1 arcmin backlash

- **EPL-F**
  Inline planetary gearbox with <8 arcmin backlash

**Articulated Robot with 7th Axis**

*Products for every axis*

From the robot joints to the lateral move of the 7th axis, GAM products bring precision to your application

- **Dyna Series + Rack & Pinion**
  High performance right angle hypoid gearbox with helical pinion and rack drive the 7th axis

**Industrial Robot**
Trunnion

GPL
Robotic inline planetary gearbox with <0.1 arcmin backlash. Supplied complete and ready to mount to the servo motor. Vibrations-free continuous coordinated motion between robot and trunnion.

GCL
Robotic cycloidal gearbox with impact resistance of 5x nominal torque for frequent starts and stops and precise point-to-point motion.

GSL
Robotic inline strain wave gearbox with <0.5 arcmin backlash.

GCL
Cycloidal gearbox with a fully integrated DS hypoid gearbox pre-stage.

GPL
Zero-backlash planetary operates vibration-free for superior positional accuracy.

Gantry Robot

SPH + Rack & Pinion
High performance helical inline gearbox with helical pinion and rack drive the 7th axis.
Broadest automation product range on the market

GAM is your complete source for innovative products used in automation technology.

**Robotic Gearboxes**
Zero-backlash gearboxes for robotics and high-precision applications with revolutionary zero-backlash planetary, cycloidal, or strain-wave (harmonic) gearing

**Servo Gearboxes**
In-line and right angle gearboxes for precision servo applications in a wide variety of configurations and frame sizes. Off-the-shelf or custom, GAM has the gearbox for your application

**Bevel Gearboxes**
Precision spiral bevel gearboxes, from miniature to extremely large, with multiple shaft configuration options for servo or precision power transmission applications

**Servo Couplings**
Bellows, elastomer, safety, or distance (line shaft) couplings are all zero-backlash and custom bored

**Rack & Pinion Systems**
Helical rack and pinion pair with GAM gearboxes for optimal system performance in a complete linear system. GAM rack available separately

**Linear Mounts**
Everything Between the Motor and the Actuator: GAM linear mounts make it easy to connect any motor to any actuator.

GAM, a U.S. company, is your complete source for robotic and servo gear reducers, rack and pinion systems, servo couplings, linear mounting kits, and other precision mechanical drive solutions used in automation technology.

With one of the largest product offerings in the motion control industry as well as the engineering expertise and manufacturing capabilities to develop customized solutions, GAM can help with your application.

U.S. manufacturing, being flexible to meet the needs of customer requests, and great service are what set us apart from the rest.

GAM Can.

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