

Technical Guide: Gantry System vs 6-Axis Robot Solution

Cross Company sells both Gantry and 6-Axis robotic solutions. Our goal is for our customers and readers to make the smartest choice for their situation and application.

In the world of motion control, the industry has reached the point where the initial cost of a 6-Axis robotic system is comparable to that of a traditional gantry system for the movement of many types of payloads. Traditional Gantry applications are being considered against a Robotic Solution which is a testament to the ever decreasing prices of both technologies. Regardless of the prices, however, gantry robots will continue to have a niche in the ever-increasing automation of the workplace.

Gantries and 6-Axis robots are widely used in industry and can often be used in similar applications. Here are a few examples of applications where both technologies are at play.

- **Palletizing:** Stacking and organizing products in an arrayed fashion.
- **Sorting:** Sorting product bins with integrated vision.
- **Pick and Place:** Traditional application involving picking a product off a conveyor or storage area and placing it in an organized fashion.
- **Conveyor Tracking:** Performing an action while matching the speed of the product on the conveyor.
- **Material Deposition:** Gluing apps and 3D printing.

Advantages of a Gantry System vs a 6-Axis Robot Solution

It is sometimes more exciting to go with the 6-Axis robotic solution. The 6-Axis robot's speed and degrees of freedom allow it to accomplish many tasks that would be impossible for the 2-4 Axes available on a traditional gantry. However, the gantry system has many advantages over the 6-Axis robotic solution, and it would be wise to consider a gantry solution in those instances.

For example, if the application doesn't require complex motion which would need the 6 degrees of freedom, there is a good chance a gantry robot would be more advantageous to the application.

So what are the advantages of a gantry solution over a 6-Axis robotic arm?

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Lower Cost

- A gantry Solution is usually lower in cost when evaluating the cost per square foot within the work envelope.
- As the work envelope grows in size, the gantry robot's cost advantage increases.

Less Floor space

- People may think that this doesn't make sense, but a gantry inherently must sit above or below the work envelope. This takes up less floor space and is a more efficient work envelope than the traditional 6-Axis robotic required location. The 6-Axis robot arm must be guarded and has unused floor space that a gantry can utilize in the same space where the robot guarding would have to be placed.
- A 6-Axis arm can be wall mounted or suspended upside down over the work envelope, but it must be placed further away from the work envelope so that it may be able to achieve its entire flexibility without jack-knifing its joints.

Infinitely Configurable Work Envelope

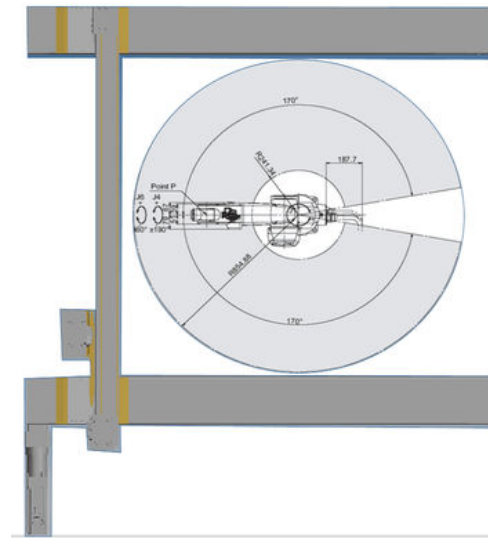
- A gantry can be configured on each axis with an infinite amount of iterations of travel, up to a certain max travel, which challenges the laws of physics of the drivetrain of the gantry. This can be done on any axis making the 3D work envelope virtually limitless.

Larger Loads

- Due to the stability of the gantry, it can achieve a larger payload at a lower cost.

Predefined Kinematics Engines

- Many 6-Axis robot programmers may think that it is easier to program a robot than it is for a gantry robot. However, this argument can be put to bed as many of the newer machine controllers have a multitude of robotic mechanical configurations.
- These 3rd party controllers can take any gantry or mechanical orientation, input the mechanical dimensions of the custom gantry, and the kinematic engine can be configured within a simple function block.



Adept Viper 850 (850 mm radius) vs a 1.7 meter XYZ Gantry Work Envelope Top View

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Feeling of Value

- Many OEM customers look for values and want to keep their material costs to a minimum so they maintain the perception of their machines as value driven.
- There have been many OEMs who did not like the thought of a 6-Axis robot on their machine because their traditional end user customers may perceive the OEMs machines as a more complicated and expensive solution, while a gantry brings a sense of value.

Cross Company's Value Add for a Gantry Solution

Many people believe that ordering a gantry robot will require more mechanical integration than a 6-Axis robotic arm. However, Cross Company can alleviate many of these concerns by providing all the mounting and integration needed to assemble the gantry in a simple process. We provide the following value added integration services free of charge:

Pre-mounted Gearboxes

Pre-mounted Motors

Pre-installed link-shaft for Gantries with idler units

- Mechanically link two axes together with a single motor.

Transition Plates

- Preconfigured bolt configurations and adapter plates for easy

Cable Carriers

- Preinstalled cable management for servo, sensor, and end of arm tooling management.

Customer Design Assistance

- Help the customer discover mounting possibilities for their gantry to existing framing.

Extrusion Framing

- Design and deliver aluminum extrusion support systems.

Cross Company Guarantee

- When we size a system, it is guaranteed to a customer specified performance required.
- If the installed system does not meet these mechanical requirements Cross Company will ensure that it meets them free of charge.

No matter what your industrial application is, Cross robotics specialists can help you determine the right robot and accessories to automate it. Contact us today.