



Adept New Application Review Worksheet

Please provide a brief description of application.

Robot requirements:

- What type of robot / robot mounting is required (SCARA, 6-Axis, Linear Modules)?

- What type of robot mounting is required (table top, invert mounted)?

- What reach / work envelope is required?

- What is the Z stroke?

- What is the payload, including the gripper?

- What repeatability is required (i.e., NOT accuracy)?

- What is the required cycle time?

- What gripper type will be used?

- Is an offset gripper required?

- What dwell time will be required for the gripper?

- What is the process (i.e., order of operations)?



Vision requirements:

- Is vision required?

- Will the parts be stationary or moving?

- If moving, what is the speed of the belt

- What type of belt will be used?

- Are any quality inspections required?

- Will the parts be completely random?

- Will the parts be dirty?

- Are samples of good/bad parts to evaluate available?

Controls requirements:

- What communication to the real world is needed (i.e., DIO, DeviceNet, serial, etc.)?

- Are additional axes need?

- Are servo kits need?

- Are multiple robots required on one controller?



Implementation Requirements:

- Do you currently have any robots?

- Do you currently have Adept robots

- Is the system being quoted to an integrator or to the end user?

- If end user, who will do the system?

- What software / programming interface will you use?

- Is a demo / video required?

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Robot Types & Selection

Robot Types:

Scara (Selection Compliance Assembly Robot Arm) – **Adept Cobra Series**

- SCARA robots generally possess four axes. Their work envelope is determined by three joints and the wrist. This robot is normally used with high speed pick and place, assembly and packaging applications.



Articulated (Six-axis) – **Adept Viper Series**

- An articulated robot is one which uses rotary joints to access its work space. The six-axis, articulated robot is the most versatile industrial robot. This robot allows for a high level of freedom - each arm has six, single-axis rotational joints.



Cartesian (Linear Modules) - **Adept Python Series**

- It's a robot whose arm has three prismatic joints, whose axes are coincident with a Cartesian coordinator.



Parallel (Delta style) - [Adept Quattro s650](#)

- A parallel robot is a device for performing manipulations, where the end effector is connected to the base via multiple kinematic chains (legs). It's a robot whose arms have concurrent prismatic or rotary joints. Parallel robots are usually faster than traditional articulated robots, since the motors can be mounted on the base, thus saving weight



Selection Criteria:

Choosing between **Scara** and **Cartesian** robots can be difficult. Both styles provide excellent solutions for pick and place, assembly, and packaging applications, but each robot has unique features and advantages. By understanding these differences, and carefully evaluating your work space, application, and product, you can make the best decision.

Consider Your Work Envelope:

The SCARA or Selective Compliant Assembly (or Articulated) Robot Arm robot provides a circular work envelope. This broad movement range allows for added flexibility. Scara robots have a small footprint and can be built on a smaller scale.

Cartesian robots work from an overhead grid. Also known as gantry robots, this type of robot is an accurate, quick solution for material handling applications. Its work envelope is rectangular. The work envelope is determined by the grid - so it can be quite large. The Cartesian robot's overhead grid can take up overall room, but does free up floor space.

Assess Movement:

The Scara robot provides more flexibility than the Cartesian robot. Its circular work envelope is created by 4-axis motions. While rigid, the Scara robot can move with more flexibility in a horizontal plane. Depending on the application, a Scara can perform with more speed than a Cartesian robot.

The Cartesian style robot is capable of X, Y, Z directional movements. Its rigidity allows for more precision. Easy to program and ideal for applications that require movements such as straight line insertions, the Cartesian robot is a strong, dependable mover.

Keep Your Part in Mind:

How big or small is your product? All the joints on a Scara robot are located at the end of the arm, limited payload capacity. Scara robots are best for smaller sized parts.

Cartesian robots, on the other hand, are an excellent choice for larger parts. Their payload is larger and fully supported. Because of they work from a grid, Cartesian robots provide better accessibility to larger parts.

Six-Axis Advantages:

- The advantages of a vertically articulated robot compared to a SCARA are its flexibility and dexterity.
- Sometimes workpieces come into the robot cell at an angle and with SCARAs, something has to be done to make the part flat. That's additional cost and additional hardware
- With the dexterity of the vertically articulated robot, you can use the robot to pick up and re-orient the part
- six-axis articulating robots also are more adaptable to variations or changes during a project, and offer more flexibility during and after a program
- Unlike a linear robot, a pedestal-mounted six-axis robot has a spherical, rather than rectilinear, work envelope.
 - The jointed-arm model can reach above, below, all around, and behind itself.

Parallel Robot Advantages:

- Greatest speed
- Quattro has large work envelope
- High speed packaging, over the conveyor belt.