

Programming a Pick-and-Place Task

When programming pick and place tasks, the economic objective generally is to carry out the task as quickly as possible while avoiding all obstacles. This means that long moves are programmed in joint coordinate moves between approach and departure points and either in world or tool coordinate moves between these intermediate points and the resting points of the objects to be moved.

Approach and departure points are intermediate locations which allow the robot hand unobstructed access to the object, generally in the direction pointed by the fingers. As the names imply, an approach point is the used for the path toward the object and an departure point is programmed on return from the object. Frequently, approach and departure points are identical but sometimes different locations are needed when, for example, picking up a large object. The distance between approach/departure points and the object is as small as possible but large enough to prevent the hand from accidentally knocking the object out of position. Keep in mind that the hand does not always travel through intermediate points exactly but on fast moves rounds off corners.

As you approach the object make sure the fingers are open and that there is enough time for the fingers to close before you try to move the object. There needs to be enough space around the object for the fingers to open and close without coming into contact with other objects. This is particularly important when loading pallets or doing assembly tasks.

Typical instructions used are the incremental move (move), the absolute move (move to), and the gripper open and close (OPEN & CLOSE) instructions. In the video clip, the pick location is the index table and the place location is the conveyor belt. Note that there is also a third position, the starting or rest position for the hand between moves.