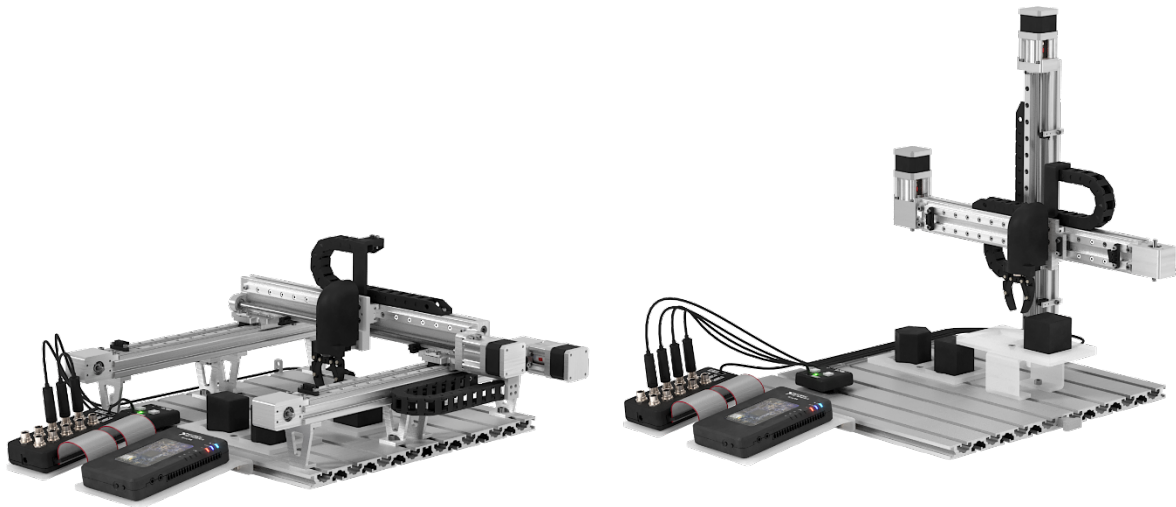


Gantry Robot Training Kit



Overview

The Gantry Robot training kit is designed for skills acquisition of practical application of gantry systems for allowing to solve relevant problems of movement in automated production lines. The design of such robot is based on a modular principle. When solving production problems, a combination of modules makes it possible to find optimal non-standard solutions. The movement functions of the Gantry Robot are implemented using belt and screw transmission. Educational stand allows students to learn the basic functions of the robot and the following main components:

- linear motion modules;
- control system;
- end effector;
- additional equipment.

The Gantry Robot consists of three linear motion systems providing movement of the working body along the x and y axes. The boundaries of the working body provides limit switches.

The training kit is equipped with the following interchangeable nozzles:

- mechanical gripper;
- drawing nozzle.

The training kit has the following functionality:

- gripping of objects;
- displacement of objects;
- output of graphical information;
- transformation of manipulator.

The educational platform gives students the opportunity to gain the following skills:

- algorithms development for control of Gantry Robot;
- automation and control of production processes;
- development and creation projects on their own.

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List of Exercises

1. The study of the design features of the Gantry Robot
2. The study of Gantry Robot software
3. The implementation of simple movement operations
4. Solving the direct and inverse kinematics
5. The study gripping, moving and objects relocation algorithms
6. The study of automated drawing algorithms
7. Implementation of robot motion algorithms along a given positions

The Gantry Robot training kit is based on the NI myRIO control-measuring equipment.

Course software has been developed in the NI LabVIEW Graphical Programming Environment.

The course software has a simple user interface. During each experiment, the corresponding window with the necessary tables, coordinate planes, and calculation formulas is displayed on the monitor. Students will collect, display and save the obtained data in tables and graphs. The exercises include mechanical assembly and software implementation of the production task.

The training kit guidelines have been developed with theoretical material and step-by-step instructions for each experiment.

The *Gantry Robot* training kit is delivered in a plastic container .



The training kit is designed for high school and college students.

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