

Motion Control with Integrated Drive Monitoring Algorithms and Methods for Endurance Testing Machines

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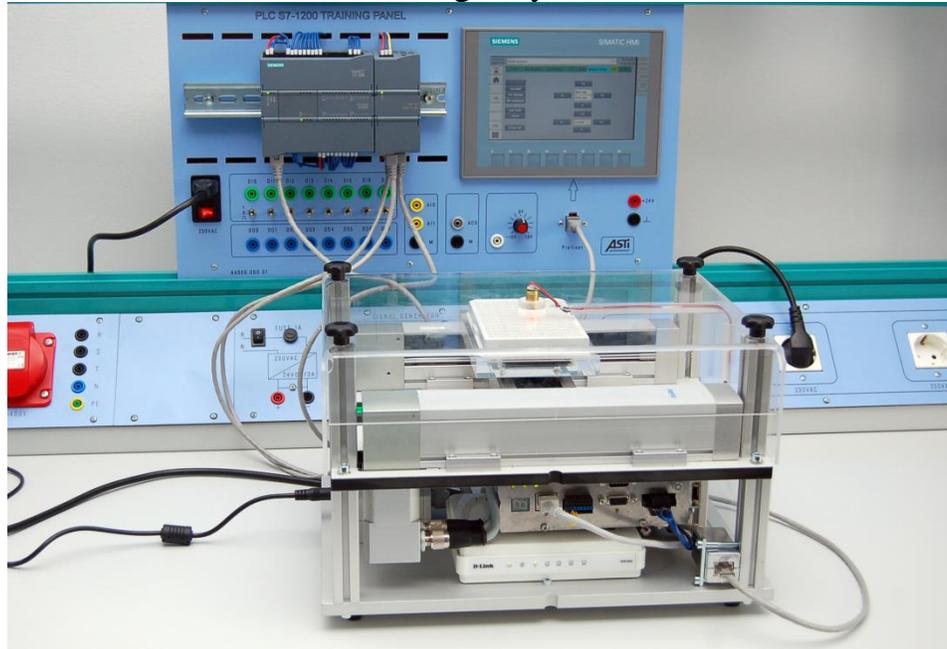
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***Abstract:** This paper presents some algorithms for a motion control system based on advanced motion control, wiring and connectivity devices, motor drive units and software tools. Controllers generate trajectories which the motors follow. Drives then take the signals sent and change them into signals that actually move the motors. Feedback devices are used to close the control loop in closed-loop systems.*

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In this research ASTI Automation developed a special equipment with FESTO Planar Surface Gantry and SIEMENS PLC for motion control algorithms implementation.

FESTO Planar surface gantry with Siemens PLC control



The system integrates a small XY planar surface gantry produced by FESTO (EXCM-30) with drive-controller. The Ethernet TCP/IP, CANopen and IOs available interfaces allows the trainee to approach different control strategies.

Includes:

- FESTO EXCM-30-150-110 planar surface gantry with the main features:
 - Stroke: X-axis [mm]: 150; Y-axis [mm]: 110;
 - Max load: 3 [kg];
 - Max speed: 0.5 [m/s];
 - Max. acceleration: 10 [m/s²];
 - Repetition accuracy: ± 0.05 [mm];
 - Positioning accuracy: ± 0.5 absolute;
- Drive controller unit;
- Power supply;
- ON/OFF push button with lamp;
- carriage that can hold various accessories.

The main objectives of the research:

- Acquiring basic and advanced knowledge in the field of motion control;
- Use planar surface gantry in different motion control scenarios;
- Learning how to implement PLC based motion control solutions;

- Get familiar with the available communication interfaces.

Future research applications:

- carriage positioning;
- object presence check (with matrix tray and small pieces);
- draw shapes (with drawing accessories).