

Robotics Lab

Overview

The Robotics Lab is a mobile robot with omnidirectional wheels. The platform is equipped with a set of sensors and a manipulator with 4 degrees of freedom. The platform can be used as a laboratory bench for universities and a robotics application development platform for research groups. Combining a powerful NI Single-Board RIO controller with the robust NI LabVIEW Robotics Module allows using the platform for rapid deployment and development of robotics solutions.

The software delivery package of the platform contains open source demonstration software which allows the users to reuse the ready drivers of the sensors and VIs to develop their own applications.

The platform can be powered both from built in battery and from external power supply and has smart charger which allows rapidly charging the battery and extending the battery life.

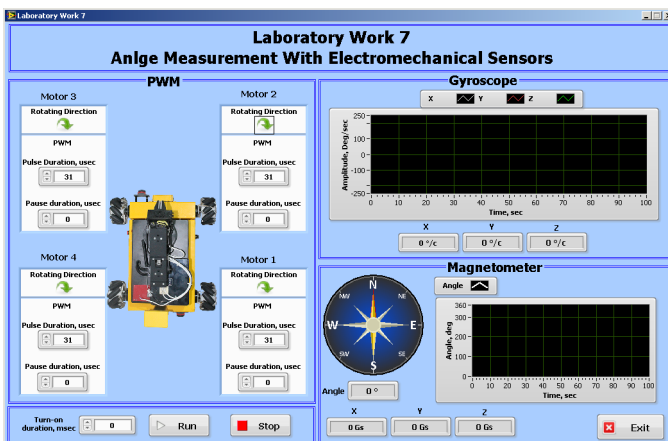
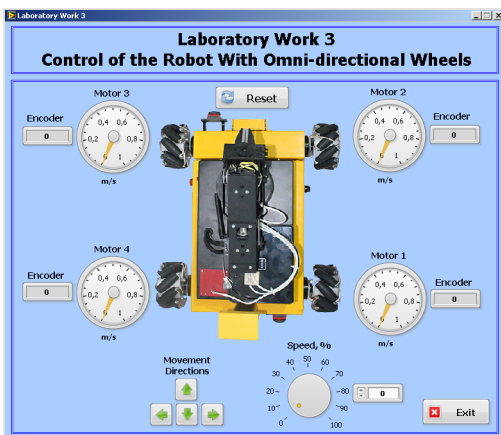
Features

- Simultaneous control of 4 motors using NI sbRIO hardware platform
- Control of a manipulator with four degrees of freedom
- Control of the platform with omnidirectional wheels
- Data measurement from the following sensors:
 1. Ultrasonic distance meter
 2. Infrared distance meter
 3. Laser distance meter (LIDAR)
 4. Digital compass
 5. Tilt sensor
 6. Humidity sensor
 7. Color sensor
 8. Barometer
 9. Digital temperature sensor
 10. Touch sensor
 11. Accelerometer
 12. Gyroscope



Hands-on Works

1. Getting started with the Robotics Educational Platform.
2. Simultaneous PWM control of motors.
3. Control of a mobile robot with omnidirectional wheels.
4. Ultrasonic distance measurement sensors.
5. Infrared distance measurement sensors.
6. Color and light sensor.
7. Angle measurement using a magnetometer sensor.
8. Obstacle avoidance.
9. Electronic compass based on magnetoresistance sensor.



Hardware and Software

- NI sbRIO-9636 Controller
- Basler IP Camera
- Machine Vision Lenses
- NI LabVIEW Robotics Module
- NI LabVIEW FPGA Module
- NI LabVIEW Real-Time Module
- Personal Computer