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NI C Series Motion Module for CompactRIO

NI 9505

- Full H-bridge brushed servo motor drive with a built-in encoder interface and current sensor
- Continuous current of up to 5 A at 40 °C (or 1 A at 70 °C) at 30 V – for higher-power requirements, attach NI 9931
- Direct connectivity to actuators such as fractional horsepower brushed DC servo motors, relays, lamps, solenoids, and valves
- Create custom current loop algorithm for optimized torque control with LabVIEW FPGA
- Use data from current sensor for flexible sampling time and filtering of the motor current for control loop optimization
- Create powerful custom motion control systems using the NI SoftMotion Development Module for LabVIEW



Overview

The NI 9505 C Series module for NI CompactRIO is a full H-bridge servo motor drive for direct connectivity to actuators such as fractional horsepower brushed DC servo motors, relays, lamps, solenoids, and valves. With its low-power consumption and small form factor, combined with the reconfigurability and performance of the field-programmable gate array (FPGA), you can create intelligent, energy-efficient control systems using the NI LabVIEW graphical system design platform. The NI 9505 delivers continuous current of up to 5 A at 40 °C (or 1 A at 70 °C) at 30 V. To increase the output power of the module, National Instruments offers an additional screw-terminal accessory you can use in place of the standard screw terminal included with the NI 9505 module. With the NI 9931 screw-terminal accessory, the NI 9505 can deliver a maximum current of 7.3 A at 40 °C (or 1 A at 70 °C). The NI 9505 module benefits electronics engineers designing consumer appliances, industrial control engineers designing small- to medium-sized machines, and automotive engineers working on rapid prototyping applications.

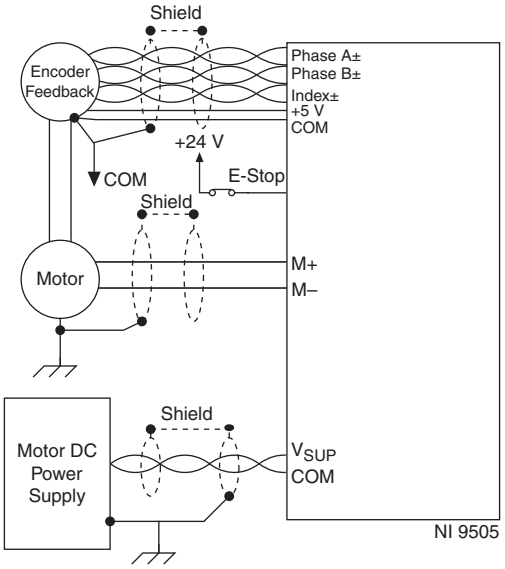
Key Features

This module includes a built-in encoder interface for single-ended or differential inputs for position feedback from a quadrature encoder. It also includes a current sensor you can use to sample the current through the motor, or actuator, and read it through the FPGA in the CompactRIO chassis. You can use real-time data from the current sensor for flexible sampling time and motor current filtering to optimize the control loop. With functions such as trajectory generation, spline interpolation, and proportional integral derivative (PID) control featured in the NI SoftMotion Development Module for LabVIEW, you can develop a complete reconfigurable motion control and drive system in a compact form factor with CompactRIO and LabVIEW. By customizing FPGA logic on CompactRIO, you can accurately control torque in addition to velocity and position. You also can implement advanced control techniques, such as notch filter use, to avoid exciting the system at resonant frequencies or apply gain scheduling, to adjust for changing load inertia. You can use the real-time embedded processor on CompactRIO to implement functions such as supervisory control and trajectory generation for multiaxis coordination and accurate velocity/acceleration profiles for smooth movements. The NI SoftMotion Development Module for LabVIEW provides the necessary functions and examples to create a custom motion control system using CompactRIO.

The nine-pin D-Sub connector on the NI 9505 offers encoder input for position and velocity feedback in addition to a +5 V connection for encoder power and an emergency stop input. The NI 9505 also has a screw-terminal connector that provides power connection to the motor or actuator. This hot-swappable module has four LEDs to display status information for chassis power, motor power, drive disable, and drive fault. It indicates the presence of a drive fault in cases of overvoltage, undervoltage, short to supply power or ground, or excessive temperatures in the module.

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NI 9505 Connections

Applications

The minimal power dissipation and accurate velocity or position control provided by CompactRIO with the NI 9505 is especially important when prototyping control systems for consumer appliances such as printers, copiers, scanners, and fax machines. The ruggedness of the CompactRIO platform makes the NI 9505 attractive for use in automated test equipment, process control systems, programmable machine tools, instrumentation panels, robotics, and pick-and-place machines. CompactRIO with the NI 9505 is also an excellent commercial off-the-shelf platform for developing complex rapid prototyping applications in the automotive industry for subsystems such as engine, transmission, emission control, body and chassis, instrumentation, antilock braking, and electronic fuel injection.

Ordering Information

NI 9505	779126-01
NI 9931 higher-power motor screw-terminal accessory for NI 9505	780571-01
NI 9943 9-pin connector kit with strain relief	779570-01
NI 9946 4-pos NI 9505 plugs (quantity 10)	779571-01
NI 9947 4-pos NI 9505 plug with strain relief	779580-01

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For complete product specifications, pricing, and accessory information, call (800) 813 3693 (U.S.) or go to **ni.com/compactrio**.

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