

Cable for Connecting NI R Series Intelligent Data Acquisition Devices to ECP Electromechanical Plants

NI ECP-RIO **NEW!**

Compatible NI R Series Devices

- NI 783x
- NI 784x
- NI 785x

Compatible ECP Electromechanical Plants

- Model 205 torsional
- Model 210 rectilinear
- Model 220 industrial emulator
- Model 505 inverted pendulum
- Model 750 gyroscope
- Inverted pendulum accessory¹

¹Contact ECP if you purchased the ECP inverted pendulum accessory and do not have the correct ECP encoder cable with both a round and DB9 connector.



Overview

Educational Control Products (ECP) and National Instruments have jointly developed the NI ECP-RIO cable, designed to connect an NI FPGA reconfigurable I/O (RIO) device seamlessly to selected ECP electromechanical plants. Read the connection instructions carefully when using the cable with your hardware configuration.

Cable Connection Instructions

The ECP-RIO cable works with both ECP power supply variations used with the compatible plants. The following instructions outline the cable connections for using each power supply model. You can identify the power supply model by the number of banana plug ports on the front of the ECP power supply chassis.



Figure 1. Compatible ECP Electromechanical Plants

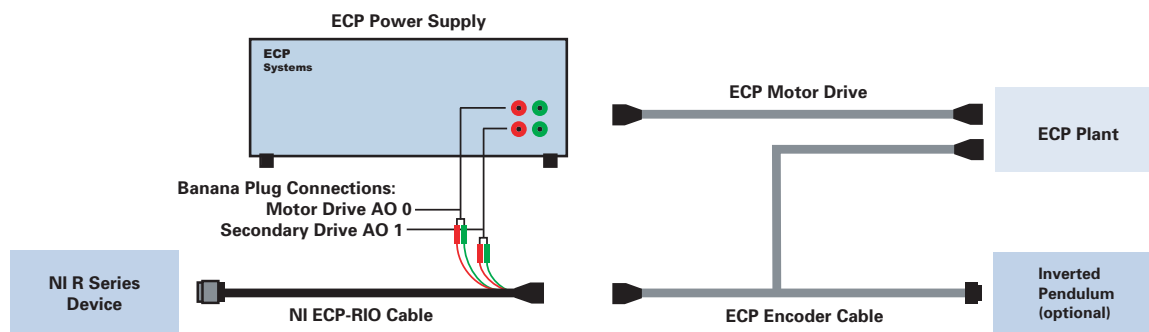


Figure 2. Power Supply I – 4 Banana Plug Input Jacks on the Front of the Power Supply

Note: The plugs are typically red (+) and green (-).

1. Power down the ECP power supply and computer containing the R Series device.
2. Attach the metal connector of the ECP-RIO cable to the multifunction I/O (MIO) connector on the R Series device.
3. Attach the round connector of the ECP-RIO cable to the ECP encoder cable.
4. Attach the banana plug wires labeled “Motor Drive AO 0” to the top banana plug inputs (red to red, green to green).
5. Attach the banana plug wires labeled “Disturbance Drive AO 1” to the bottom banana plug inputs (red to red, green to green).

Cable for Connecting NI R Series Intelligent Data Acquisition Devices to ECP Electromechanical Plants

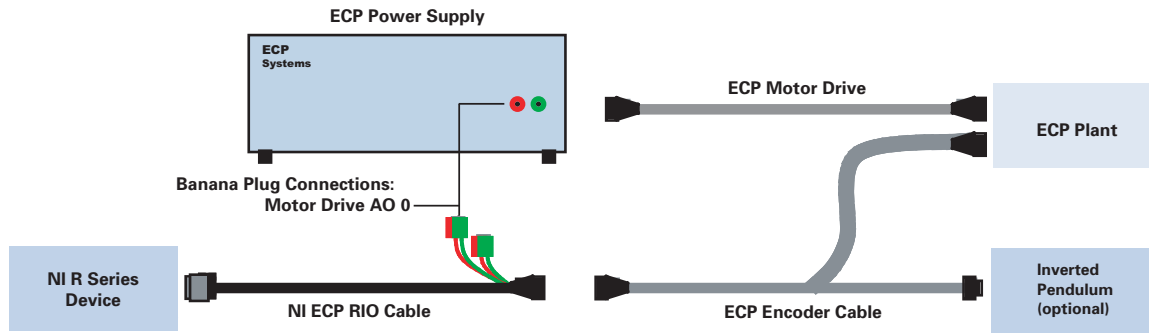


Figure 3. Power Supply II – 2 Banana Plug Input Jacks on the Front of the Power Supply

Note: The plugs are typically green (+) and black (-).

1. Power down and disconnect the power cord from the ECP power supply.
2. Remove the screws around the top of the power supply.
3. Inside the ECP power supply, move the wire connected to the left (green) banana plug from terminal 29 to terminal 43. Any other wires connected to these respective pins should remain.
4. Replace the ECP power supply cover and reconnect power.
5. Attach the metal connector of the ECP-RIO cable to an NI RIO device.
6. Attach the round connector of the ECP-RIO cable to the ECP encoder cable.
7. Attach the banana plug wires labeled “Motor Drive AO 0” to the banana plug inputs (red to green, green to black).
8. Place tape over the “Disturbance Drive AO 1” banana plug contacts to prevent shorting.

Visit ecpsystems.com for more information.

NI R Series MIO Connector to ECP Plants 205, 210, 220, 505, 750				
ECP Plant			68-Pin NI FPGA VHDCI	
Description	Amp Connector	Banana Plug	Description	Pin
Encoder Power Supply +5 V	2, 1	–	+5 V supply	35
Encoder Ground	14, 3, 4	–	DGND	2, 3, 4, 5, 6, 7, 8, 9
Encoder 1 A	5	–	DIO 0	36
Encoder 1 B	6	–	DIO 1	37
Encoder 2 A	8	–	DIO 2	38
Encoder 2 B	9	–	DIO 3	39
Encoder 3 A	11	–	DIO 4	40
Encoder 3 B	12	–	DIO 5	41
Encoder 4 A	7	–	DIO 6	42
Encoder 4 B	10	–	DIO 7	43
Limit Switches	13	–	DIO 10	11
Drive Motor 1	Label: Motor Drive	Red	AO 0	55
Analog Ground		Green	AOGND 0	21
Drive Motor 2	Label: Secondary Drive	Red	AO 1	54
Analog Ground		Green	AOGND 1	20
Limit Switches	–	–	560 kΩ resistor between 35 and 11	

Note: The purpose of the built-in 560 kΩ resistor is to pull the limit switches to +5 V when using ECP Model 210 (it does not harm any other plant because other plants do not connect to that pin).

Table 1. NI ECP-RIO Cable Wire List

Ordering Information

NI ECP-RIO195880-01

BUY NOW!

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

BUY ONLINE at ni.com or CALL 800 813 3693 (U.S.)

NI Services and Support



NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit ni.com/services.

Training and Certification

NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit ni.com/training.

Professional Services

Our NI Professional Services team is composed of NI applications and systems engineers and a worldwide National Instruments Alliance Partner program of more than 600 independent consultants and integrators. Services



range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

OEM Support

We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.



ni.com • 800 813 3693

National Instruments • info@ni.com

Local Sales and Technical Support

In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at ni.com/support.

We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit ni.com/ssp.

Hardware Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit ni.com/calibration.

Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit ni.com/services.