Getting Started with the ECP RIO Cable (NI Part: 195880A-01)

This cable is designed to connect a National Instruments FPGA Reconfigurable I/O (RIO) device seamlessly to select ECP control plants. Read the connection instructions carefully for using the cable with your hardware configuration.

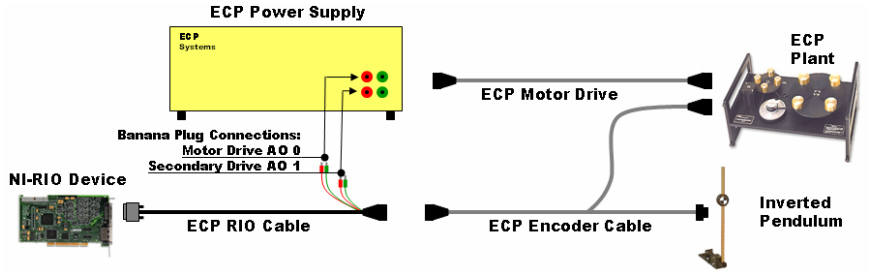
Compatibility Chart		
NI-RIO Device	**Connection**	**ECP Plant**
• NI PCI-7831R • NI PXI-7831R • NI PCI-7833R • NI PXI-7833R	• ECP-RIO Cable	• Model 205: Torsional • Model 210: Rectilinear • Model 220: Industrial Emulator • Model 505: Inverted Pendulum • Model 750: Gyroscope • Inverted Pendulum Accessory**

** Contact ECP if you purchased the Inverted Pendulum Accessory and do not have the correct ECP Encoder Cable with both a round and DB9 connector.

The ECP RIO Cable is compatible with both Plant-Only and Complete System ECP Power Supply variations used with the supported plants. The following instructions outline the cable connections for using each power supply model. The power supply model can be identified by inspecting the back of the ECP Power Supply chassis. The Complete System Power Supply has a rectangular 60-pin flat cable connector on the back while the Plant-Only Power Supply does not.

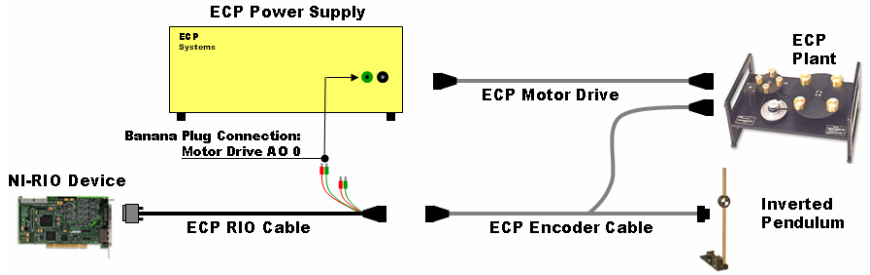
If purchasing a new system for use with the ECP-RIO Cable, please order the Plant-Only Power Supply option.

Plant-Only Power Supply: Typically 4 Banana plug input jacks on the front of the power supply, typically Red (+) and Green (–)



1. Power down the ECP Power Supply and the computer containing the NI-RIO device.
2. Attach the metal connector of the ECP RIO Cable to the NI-RIO device MIO connector.
3. Attach the round connector of the ECP RIO Cable to the ECP Encoder Cable.
4. Attach the banana plug wires labeled *Motor Drive AO0* to the top banana plug inputs (red to red, green to green).
5. Attach the banana plug wires labeled *Secondary Drive AO1* to the bottom banana plug inputs (red to red, green to green).

Complete System Power Supply: 2 Banana plug input jacks on the front of the power supply, 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, disconnect the wire connected to the left (green) banana plug from terminal 29 and reconnect to terminal 43. Any other wires connected to these respective pins should remain connected.
4. Replace the ECP Power Supply cover and reconnect the power cord.
5. Attach the metal connector of ECP RIO Cable to the 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 AO0* to the banana plug inputs (red to green, green to black).
8. Place tape over the *Secondary Drive AO1* banana plug contacts to prevent shorting.

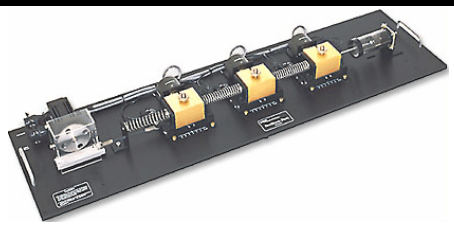
Visit ni.com for more information on the NI 783xR Reconfigurable I/O Devices for PCI/PXI/CompactPCI Bus Computers.
Refer to http://www.ecpsystems.com for more information on supported ECP plants.

Supported ECP Plants

Model 505:
Invented Pendulum

Model 205:
Torsional

Model 220:
Industrial Emulator



Model 210:
Rectilinear

Model 750:
Gyroscope

Inverted Pendulum
Accessory

ECP RIO Cable Wire List

NI-RIO MIO Connector to ECP Plants 205, 210, 220, 505, 750				
ECP Plant			**68 Pin NI FPGA VHDCI**	
Description	**Amp Connector**	**Banana Plugs**	**Description**	**Pin**
Encoder Power Supply +5V	2,1		+5 Volts 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 Plug	AO 0	55
Analog Ground		Green Plug	AOGND 0	21
Drive Motor 2	Label: **Secondary Drive**	Red Plug	AO 1	54
Analog Ground		Green Plug	AOGND 1	20
Limit Switches			560 kOhm Resistor between 35 and 11	

It is necessary to connect a 560 kOhm resistor to +5 volts when using plants with mechanical limit switches.
This resistor will not affect the operation of plants without mechanical limit switches.

Label: **ECP-RIO Cable**

Aug2006 324446A-01