IO Extender Installation Guide

Supported Model

C4-IOX-E-B   IO Extender

Introduction

The Control4® IO Extender opens up a whole world of options in the Control4 system to control home theaters, video devices, motion sensors, and other devices that use infrared (IR), serial, contact, and relay connections. The IO Extender serves well as the companion to the Home Controller HC-1000 to expand output capability; in addition, the IO Extender provides flexible options for mounting in an equipment rack (1U) or on a wall.

To mount the unit on the wall, use the optional feet and keyholes on the bottom of the unit. These keyholes are designed to fit the screw spacing found on a standard U.S. double-gang box.

To mount the unit in a rack, install the included rack mount ears and install the device in the rack. The device can be mounted with the front facing outward, or optionally, it can be mounted on the equipment rack's rear rails with the rear of the device facing outward for easier access to the input and output connectors. The rack mount ears can be mounted to the bottom of the device with the ears at the front (for front rack mounts), or alternatively, with the ears at the back (for rear rack mounts).

Box Contents

• IO Extender
• Power cord
• 6 IR Emitters
• 4 Pluggable Contact/Relay Connectors
• 1U Rack Mount Ears
• IO Extender Installation Guide (this document). Note: You can find this and other related documents online also at the Dealer portal: http://www.control4.com/dealer/products/documentation/.

Important Safety Instructions

1   Read and keep these instructions.

2   Heed all warnings and follow all instructions for this product in this and other Control4® documents included with or related to this product.

3   Improper use of this product may result in potential electric shock.

4   Do not use this product near water.

5   Never spill liquid of any kind on this product.

6   Clean this product only with a damp or dry cloth. Do not use liquid cleaners or aerosol cleaners to clean the product.

7   Install this product according to the manufacturer's instructions.

8   Install this product according to the National Electrical Code ANSI/NFPA 70 and the prevailing local codes and requirements.

9   This product should be operated with the type of power indicated on the marked label. If you are not sure of the type of power available, consult your Control4 dealer or local power company.

10 Slots and openings on a cabinet rack, and components used with this product are provided for ventilation, reliable operation, and protection from overheating of the product. These slots and openings must not be blocked or covered.

11 This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.

12 Never push objects of any kind into this product through cabinet slots because they may touch dangerous voltage points or short out parts that could result in a fire or electric shock.

13 Only use the attachments and accessories included with this product or recommended by Control4.

14 Do not allow anything to rest on the power cord. Do not install or place this product where people will walk on the cord.

15 Do not use extension cords with any products in a Control4 system.

16 If applicable, unplug this product during lightning storms or when unused for long periods of time.

17 Do not exceed the maximum wire size (if specified) in this guide.

18 This product must be installed by qualified professionals only.

19 Do not attempt to service this product yourself except as noted in this guide. Opening or removing covers of internal components may expose you to dangerous voltage points or other risks.

20 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged or frayed in any way; for example, a power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into this product, this product has been exposed to rain or moisture, this product does not operate normally, or this product has been dropped.

⚠ WARNING! To reduce the risk of electrical shock, do not expose this apparatus to rain or moisture.

AVERTISSEMENT! Pour réduire le risque de choc électrique, n'exposez pas cet appareil à la pluie ou à l'humidité.

WARNUNG! Um das Risiko des elektrischen Schlages zu verringern, setzen Sie diesen Apparat nicht Regen oder Feuchtigkeit aus.

⚠ WARNING! This CLASS I apparatus must be connected to an AC mains socket outlet that has a protective earthing connection (i.e., third-prong ground conductor). **DO NOT DEFEAT THE PROTECTIVE EARTHING CONNECTION!**

Requirement and Specifications

Prior to installing this product, ensure that: Ethernet network wiring is in installed and functioning.

The IO Extender specifications include:

Model Number	C4-IOX-E-B
Network Support	10/100 BaseT Ethernet
Display	LED indicators front and back
Power Requirements	100-240 VAC, 50/60 Hz, 30 W, 0.55 A
Dimensions	H x W x D: 1.59" (40.4 mm) x 16.84" (427.7 mm) x 6.44" (163.4 mm, including connectors)
Weight	4.8 pounds/2.18 kgs

Accessories Available for Purchase

• C4-CBLIR-BULK, IR Emitters, 5 pack
• C4-CBLIRF-BULK, IR Emitters with optical feedback, 5 pack

Additional Resources

The following resources are available to provide you with additional support.

• Your Control4 Reseller or Control4 Dealer
• Control4 Web Site: http://www.control4.com
• Composer documentation in online help or PDF format

Front View

1. **Status LED**—Red, Orange, and Blue blinking lights indicate the status during startup.
2. **Data LED**—Blue LED light indicates activity.
3. **Link/Identification LED**—Blue LED light indicates that the IO Extender has been identified in a Control4 Composer project. Use this button also to identify the device.
4. **Power LED**—Blue light indicates AC power is present. The device turns on immediately after power is applied to the device.

Back View
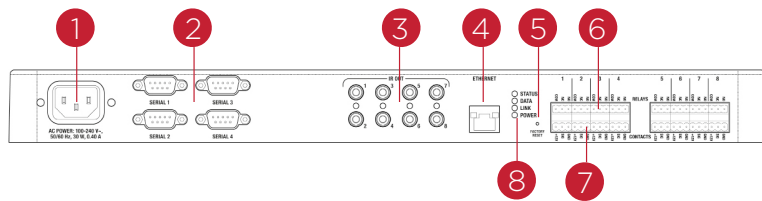
1. **Power plug port**—AC power receptacle for an IEC 320 power cord.
2. **Serial Out**—Four (4) serial output ports for DB9 (receivers, disc changers, etc.).
3. **IR Output**—Eight (8) IR output ports, 3.5 mm.
4. **Ethernet**—One (1) RJ-45 port for a 10/100 BaseT Ethernet connection.
5. **Reset Button**—Recessed Reset button.
6. **Relays (8 sets, Top Row)**—Pluggable terminal block connector for eight (8) normally closed or normally opened switchable connections.
7. **Contacts (8 sets, Bottom Row)**—Pluggable terminal block connectors for eight (8) dry contact closures, logic input connections, Door Contact Sensors, or Motion Sensors.
8. **LED Indicators**—Status, Data, Link, Power. See the previous section "Front View" in this document for details.

NOTES:
1. For your mounting convenience, the LEDs on the front and back of the device are the same.
2. Always use the ID button on the front of the device for identification.

Mounting Options

Before you install the IO Extender, figure out how you want to install it.

You can:
- Place it on a flat surface
- Mount it on the wall
- Mount it on a rack—front facing or back facing

Flat Surface
Place the device on a flat surface, and connect the devices.

Mount on a Wall - New Construction
The device can mount to a 2-gang wall box.

- Mount the 2-gang wall box.
- Hang the device on the two (2) screws in the wall box front side up.
- Connect the devices at the bottom of the device.

Mount in a Rack

Front of Rack
1. Screw the rack mount ears to the front of the device.

2. Screw the device to the front of the rack.

Back of Rack
1. Screw the rack mount ears to the back of the device.
2. Screw the device to the rails on the rack. If your rack has rear rails, this may be your best option.

Install the IO Extender

To install the IO Extender, follow these general steps:

1. **Ensure that your home network is in place before starting your system setup, including your Controller**: The IO Extender requires a network connection to use all output ports as designed. When connected, the IO Extender can access web-based media databases and the Controller.
2. **Connect the IO Extender to the network**: To connect using an Ethernet connection, plug the data cable from the home network connection into the IO Extender RJ-45 port (labeled "Ethernet").
3. **Power up the IO Extender**: Plug the IO Extender power cord (provided) into the IO Extender power plug port and then to an electrical outlet.
4. **Connect the system devices**: Follow the steps described in the "Connect Devices" section that follows.

Configure the IO Extender in Composer

Configure for Static IP
- **IP address configuration**—Set to **DHCP** by default.
- **Static IP address**—If you prefer to set up a static IP address for this device, refer to Appendix A "Setting Up a Wired and Wireless Network" (info is available only up to OS 2.0) and the section, "Set Up Network Configuration" in the *Composer Pro User Guide* or the Composer Pro online help.

Add and Identify the Device
1. In the Composer System Design view, select the room in which the device resides. Double-click **IO Extender** in the Items pane to copy it to the project tree.
2. Refer to Chapter 5, "Make and Verify Connections" in the Composer Pro User Guide (prior to OS 2.0) or in the Composer Pro online help for details about how to identify the device.
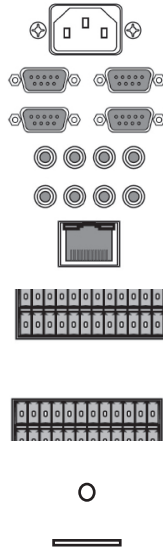
Connect Devices

NOTE: You can use the Composer software to step through the connection process before or after the physical connections are completed.

Connect all applicable devices to the IO Extender using one of the connection options described in the following table.

|	
Power plug port—For use with the IEC 320 power connector (provided).	
Serial (4)—DB9 connector for a serial device, such as a receiver or disc changer. See "Connect the Serial Ports" in this document for more information.	
IR Out (8)— 3.5 mm ports for up to eight (8) IR output transmitters. See "Set Up IR Emitters" later in this document for more information.	
Ethernet—RJ-45 for a 10/100 BaseT Ethernet connection.	
Contacts (8 sets)— Pluggable terminal block connectors for one (1) dry contact closure, logic input connection, Door Contact Sensor, or Motion Sensor. Provides power for small devices (12 V), signal input (SIG), return path (GND). The current, 1250 mA, is shared across all eight (8) sets of contacts.	
Relays (8 sets)—Pluggable terminal block connectors for one (1) normally closed or normally opened switchable connection, such as a blind, a fireplace, or a projector screen. The set contains a connection for Normally Opened (NO), Normally Closed (NC), and Common (COM). Relays are rated for 24 V 6 A maximum operation.	
Reset Button— Recessed Reset button. Use the end of a paper clip to press and reset the device.	
Identification Button—Press this button to identify the device (front of device).	

Use Pluggable Terminal Block Connectors

For the Contact and Relay ports, the IO Extender makes use of Pluggable Terminal Block connectors—removable slot retention tabs to lock in individual wires.

To connect a device to the Pluggable Terminal Block:

1   Insert one (1) of the wires required for your device into the appropriate opening in the Pluggable Terminal Block you reserved for that device (see Figure 1).
2   Insert the wire as follows:
   •   If using solid core wire, push the wire into the hole below the slotted retention tab, and ensure that it's tightly secured.
   •   If using stranded wire, push the slotted retention tab in using a small flat-blade screwdriver. Insert the wire into the hole below the tab, and then release the tab to secure the wire (see Figure 1).

Figure 1. Insert Wires into the Connectors
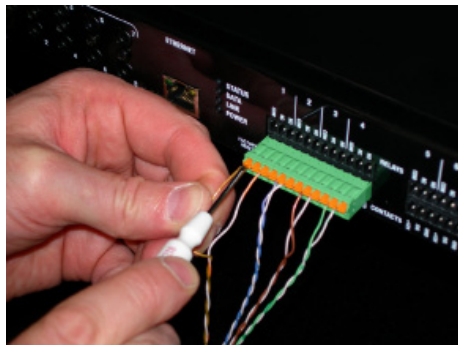
EXAMPLE: If you add a Motion Sensor, connect its wires to the following Contact openings—power input to +12V output signal to SIG, and ground connector to GND. See "Connect to a Contact Port" or "Connect to the Relay Ports" in the next sections to learn how to connect the devices.

3   Repeat Steps 1 and 2 for all wires required for your device.
   NOTE: If you connect dry contact closure devices, such as door switches, connect the switch between +12V (Power) and SIG (Signal).

Connect to a Contact Port

The IO Extender provides eight (8) Contact ports. See the following figures to determine how to connect the device to a contact port.

Figure 2. Contact for Voltage Source (e.g., Motion Sensor)
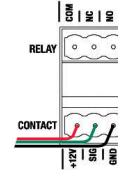
NOTE: +12V and GND are used to power the Motion Sensor. SIG and GND are used to detect the state of the Contact in the Motion Sensor.

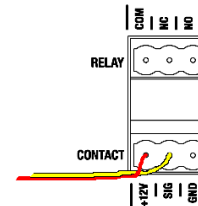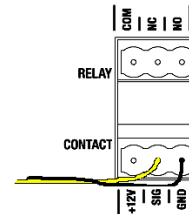Figure 3. Contact for Dry Contact (e.g., Door Contact Sensor)

Figure 4. Contact for Self-Powered Voltage Device

Connect to the Relay Ports

The IO Extender provides eight (8) Relay ports.

For most applications, attach one (1) wire to the common terminal, and the other to the normally open terminal. The Relay switches close when the Relay is activated. The IO Extender can support applications that require a normally closed Contact.
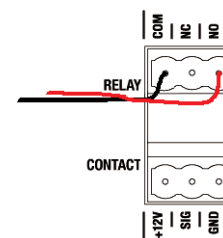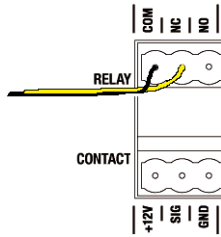
Figure 5. Relay Port: Normally Open

Figure 6. Relay Port: Normally Closed

Connect to the Serial Ports

The IO Extender provides four (4) DB9-style serial ports that use the RS-232 protocol. Connect a device to the IO Extender—for example, a receiver or disc changer—by aligning the pins, inserting the plug and tightening the screws. Serial ports support many different baud rates. All ports support Odd, Even and No Parity and hardware flow control.

Set Up IR Emitters

Your system may contain third-party products that are controlled with IR commands (usually through the System Remote Control devices).

To control a device that only recognizes IR commands, complete the following setup:

IR Emitters

1   Plug the 3.5 mm connector end of one of the IR stick-on emitters provided into an IR Out port on the IO Extender.

2   Place the stick-on IR emitter end over the IR receiver on the DVD or Blu-ray player, TV, or other target device to drive IR signals from the IO Extender to the target.

Troubleshooting

Reset Button

1   To reset the IO Extender for system recovery, on the back of the device insert the end of a paper clip into the small hole (to the right of the Ethernet connector).

2   Power cycle the device by pressing and holding the Reset button for about 5-7 seconds and the Status LED blinks orange. This action starts the recovery process.

Identification Button

1   To reset to the network defaults, on the front of the device power cycle the IO Extender and hold the Identification button until the Data, Link, and Power LEDs are solid blue; immediately release the button.

2   If during the boot sequence, the Status LED stays Orange, press and hold the Identification button until the LED blinks Blue, and then release it.

Regulatory Compliance

This product has been designed and tested to the following U.S., Canadian, European, Australian, and New Zealand standards:

> **IMPORTANT!** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
>
> **IMPORTANT!** Tous les changements ou modifications pas expressément approuvés par la partie responsable de la conformité ont pu vider l'autorité de l'utilisateur pour actionner cet équipement.

FCC/Industry Canada

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of this device.

Son fonctionnement est soumis aux deux conditions suivantes: (1) cet appareil ne doit pas causer d'interférences nuisibles et (2) cet appareil doit accepter toute interférence reçue, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

This equipment has been tested and found to comply with the limits for a Class B and C digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Industry Canada

This Class B digital apparatus complies with Canada ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Europe

In Finland: "Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan"

In Sweden: "Apparaten skall anslutas till jordat uttag"

Australian/New Zealand

- AS/NZS CISPR 22: 2002—Information Technology Equipment—Radio disturbance characteristics.

Warranty

For complete warranty information, including details on consumer legal rights as well as warranty exclusions, visit www.control4.com/warranty.

Recycling

For information on recycling, please go to www.control4.com/recycling.

About this Document

Part Number: 200-00141 Rev L 5/10/2011