

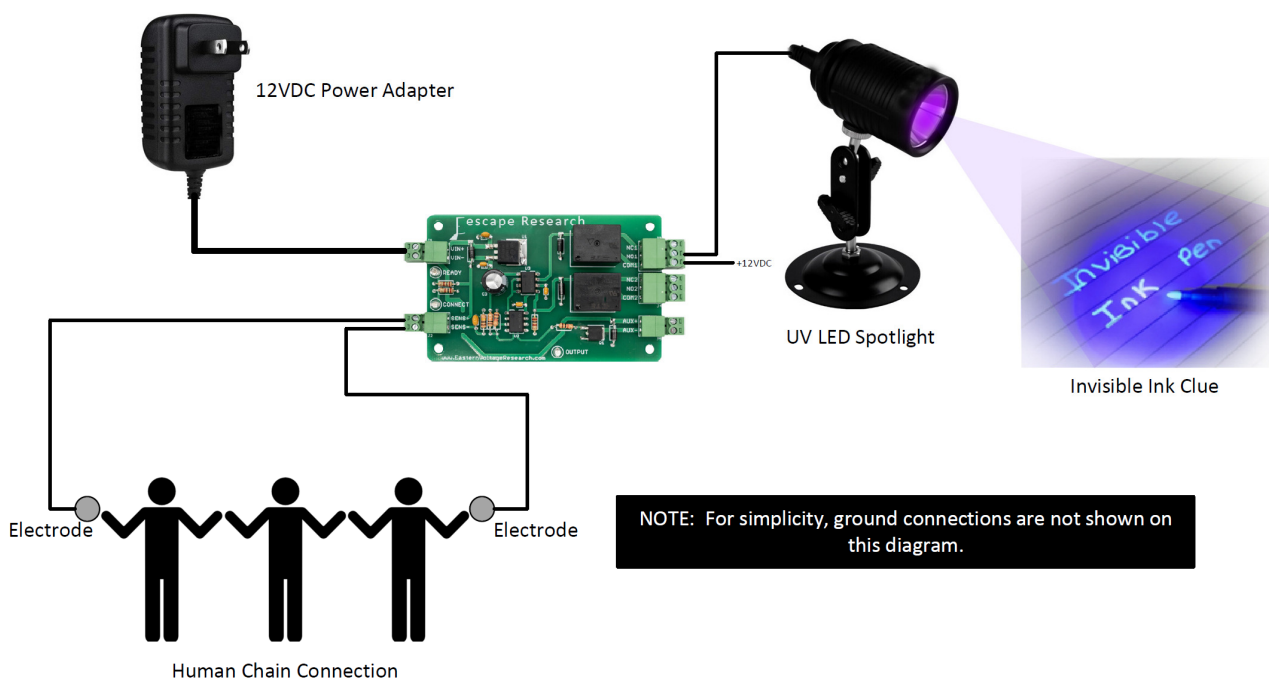
### Overview

This application guide includes several popular examples of how to incorporate the Human Chain Controller in an escape room, museum, or other venue or prop. With up to three (3) onboard relay and solid state relay output channels, you can create a near infinite number of unique puzzles or challenges. Although only a few examples are presented here, this application guide will provide you with some initial ideas and inspiration on how to use the Human Chain Controller for your own use. As always, if you need assistance, please feel free to contact us through our support email at the website below:

[www.EasternVoltageResearch.com](http://www.EasternVoltageResearch.com)

### Escape Room Application – An Invisible Clue Reveal

In this application, a UV light is positioned to reveal an important clue by illuminating invisible ink when a human chain of one or more individuals closes a circuit with their hands using two electrodes. The UV LED spotlight is connected to the normally open (NO) contacts of the relay output so when the human chain is made, the relay closes and activates the UV LED spotlight and thus revealing the hidden clue.



NOTE: Ground connections are not shown on this diagram. Be sure to connect grounds (returns) as required for the devices connected to the human chain controller. Relay outputs do require an external +12VDC connection. The solid state output (AUX+ and AUX-), however, has its own +12VDC. Please refer to the Human Chain Controller datasheet for more detailed information.

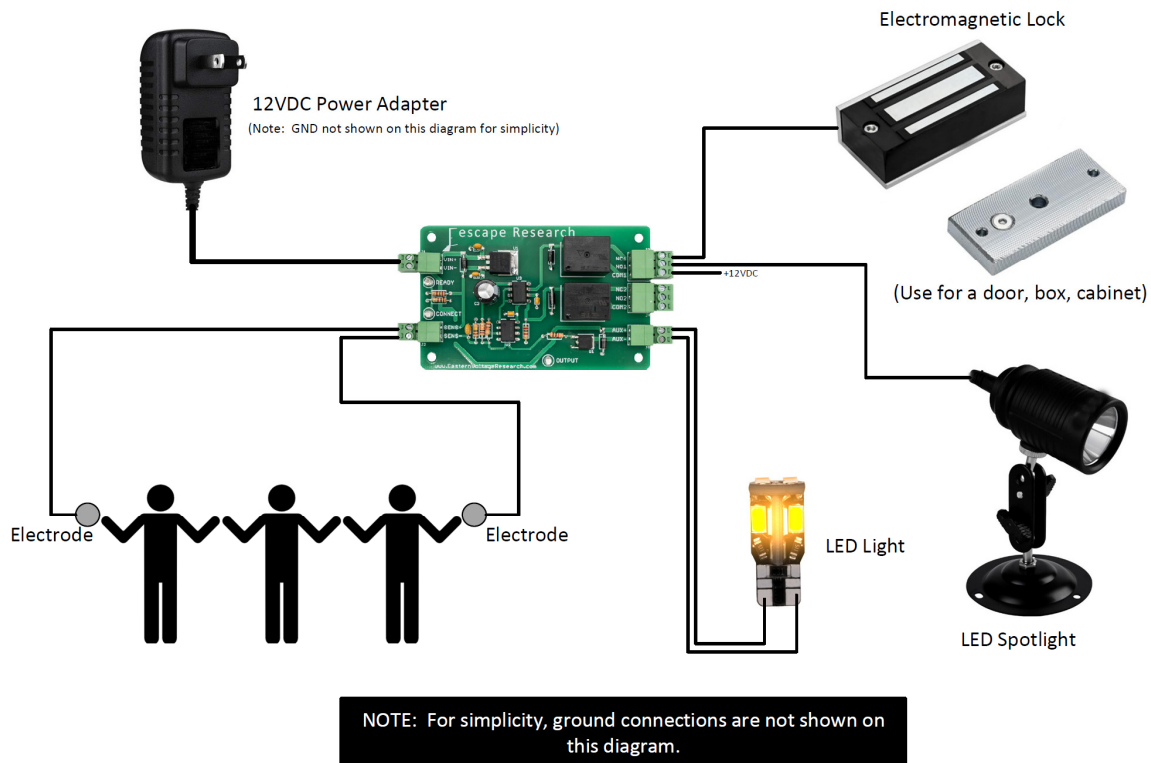
(Not shown in diagram) The UV LED spotlight must either be externally powered via a separate +12VDC source, or connected to the 12VDC power adapter.

### Required Parts

- 12VDC power supply or AC adapter
- Human Chain Controller 1.0 (single relay output) or Human Chain Controller 2.0 (dual relay output)
- Two (2) electrodes (DIY or available at Eastern Voltage Research)
- UV LED spotlight
- UV invisible ink marker or paint

## Escape Room Application – A Locked Treasure Chest

For this escape room implementation, there is a wooden box (treasure chest) with a hinged lid that is locked using an electromagnetic lock. The lock is wired to the normally closed (NC) contact of the output relay. When the human chain is not connected, the electromagnetic lock will be energized and secure the box's lid. An LED spotlight pointed at the box is connected to the normally open (NO) contact of the output relay and a small LED light is connected to the solid state relay output. When the human chain is connected, the output relays activate removing power from the electromagnetic lock and allowing the box to be opened, while the LED spotlight illuminates the box indicating something is occurring to the box and thus drawing attention to it. Likewise, the additional LED light connected to the solid state relay output is positioned inside the box so that a glow is seen from inside the box when the electromagnetic lock is disabled.



NOTE: Ground connections are not shown on this diagram. Be sure to connect grounds (returns) as required for the devices connected to the human chain controller. Relay outputs do require an external +12VDC connection. The solid state output (AUX+ and AUX-), however, has its own +12VDC. Please refer to the Human Chain Controller datasheet for more detailed information.

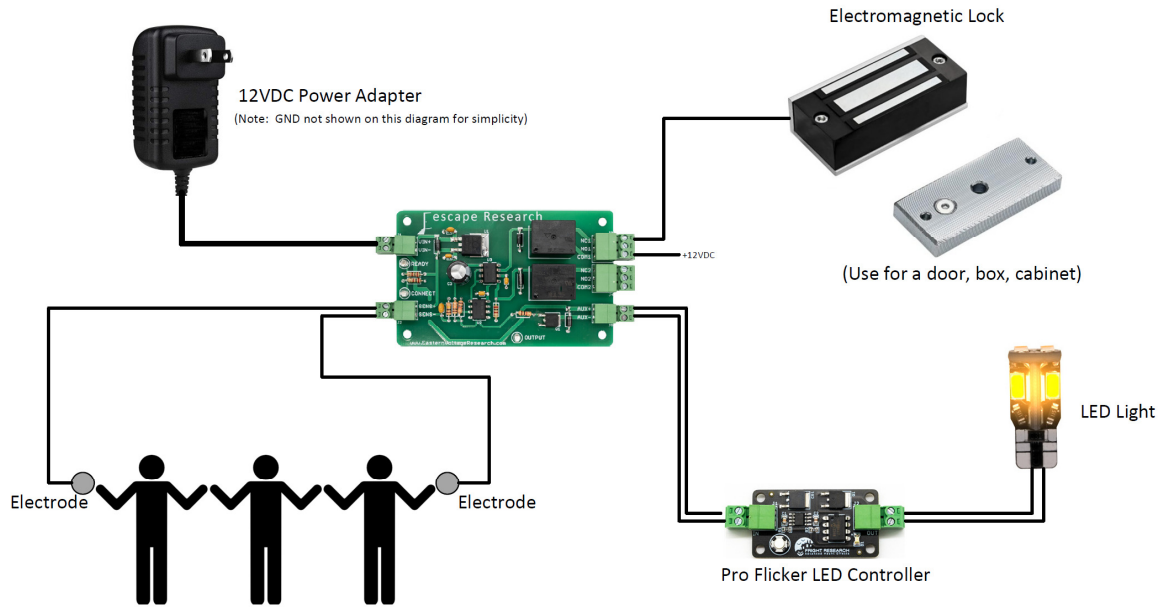
(Not shown in diagram) The electromagnetic lock must either be externally powered via a separate +12VDC source, or connected to the 12VDC power adapter.

## Required Parts

- 12VDC power supply or AC adapter (must be sized for the current requirements of the electromagnetic lock)
- Human Chain Controller 1.0 (single relay output) or Human Chain Controller 2.0 (dual relay output)
- Two (2) electrodes (DIY or available at Eastern Voltage Research)
- Electromagnetic lock (Eastern Voltage Research or other source)
- LED spotlight
- Candle Flame LED Bulb (Eastern Voltage Research)

## Escape Room Application – A Locked Escape Door

A customer used this set-up for an escape room where there was an exit door to the next puzzle room controlled by the human chain controller. The exit door was locked using an electromagnetic door lock. The lock in this set-up is wired to the normally closed (NC) contact of the output relay. When the human chain is not connected, the electromagnetic lock will be energized and prevent the door from opening. When the human chain is connected, the output relays activate removing power from the electromagnetic door lock and thus permitting the door to be opened. A lantern prop is hung next to the door to provide a visual cue that the door is unlocked. A flame colored LED inside of the lantern prop is controlled through one of our Pro Flicker LED controllers to provide a realistic candle flame effect. This LED is connected directly to the solid state relay output of the human chain controller board.



**NOTE:** For simplicity, ground connections are not shown on this diagram.

NOTE: Ground connections are not shown on this diagram. Be sure to connect grounds (returns) as required for the devices connected to the human chain controller. Relay outputs do require an external +12VDC connection. The solid state output (AUX+ and AUX-), however, has its own +12VDC. Please refer to the Human Chain Controller datasheet for more detailed information.

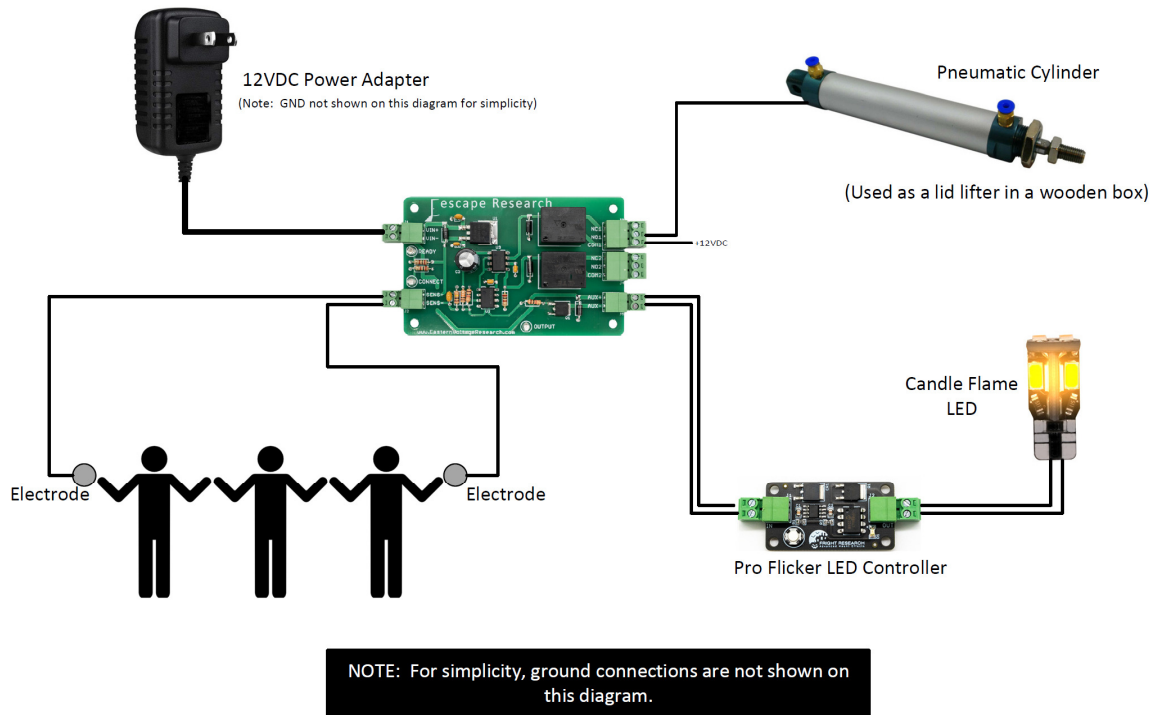
(Not shown in diagram) The electromagnetic lock must either be externally powered via a separate +12VDC source, or connected to the 12VDC power adapter.

## Required Parts

- 12VDC power supply or AC adapter (must be sized for the current requirements of the electromagnetic lock)
- Human Chain Controller 1.0 (single relay output) or Human Chain Controller 2.0 (dual relay output)
- Two (2) electrodes (DIY or available at Eastern Voltage Research)
- Electromagnetic lock
- Pro Flicker LED Controller – Candle and Flame Suite (Eastern Voltage Research)
- Candle Flame LED Bulb (Eastern Voltage Research)

## Escape Room Application – An Opening Crate Reveal

Another way to unlock a box or crate is to use a pneumatic solenoid to lift the lid open. In this escape room, there is a hidden box with the lid connected to a pneumatic cylinder. The pneumatic cylinder is controlled through a solenoid valve that is connected to the normally open (NO) contact of the output relay. An LED is installed inside the box to illuminate its contents once it is opened. This LED is controlled through one of our Pro Flicker LED controllers to provide a realistic flame effect. When the human chain is connected, the output relay will be activated and cause the pneumatic cylinder to open the lid of the box revealing its secrets. Likewise, the solid state relay output is activated and the LED is turned ON and thus illuminating the inside of the box.



NOTE: Ground connections are not shown on this diagram. Be sure to connect grounds (returns) as required for the devices connected to the human chain controller. Relay outputs do require an external +12VDC connection. The solid state output (AUX+ and AUX-), however, has its own +12VDC. Please refer to the Human Chain Controller datasheet for more detailed information.

(Not shown in diagram) The electromagnetic lock must either be externally powered via a separate +12VDC source, or connected to the 12VDC power adapter.

## Required Parts

- 12VDC power supply or AC adapter (must be sized for the current requirements of the electromagnetic lock)
- Human Chain Controller 1.0 (single relay output) or Human Chain Controller 2.0 (dual relay output)
- Two (2) electrodes (DIY or available at Eastern Voltage Research)
- Pneumatic cylinder and required air tubing / adapters
- 12V solenoid valve
- Pro Flicker LED Controller – Candle and Flame Suite (Eastern Voltage Research)
- Candle Flame LED Bulb (Eastern Voltage Research)