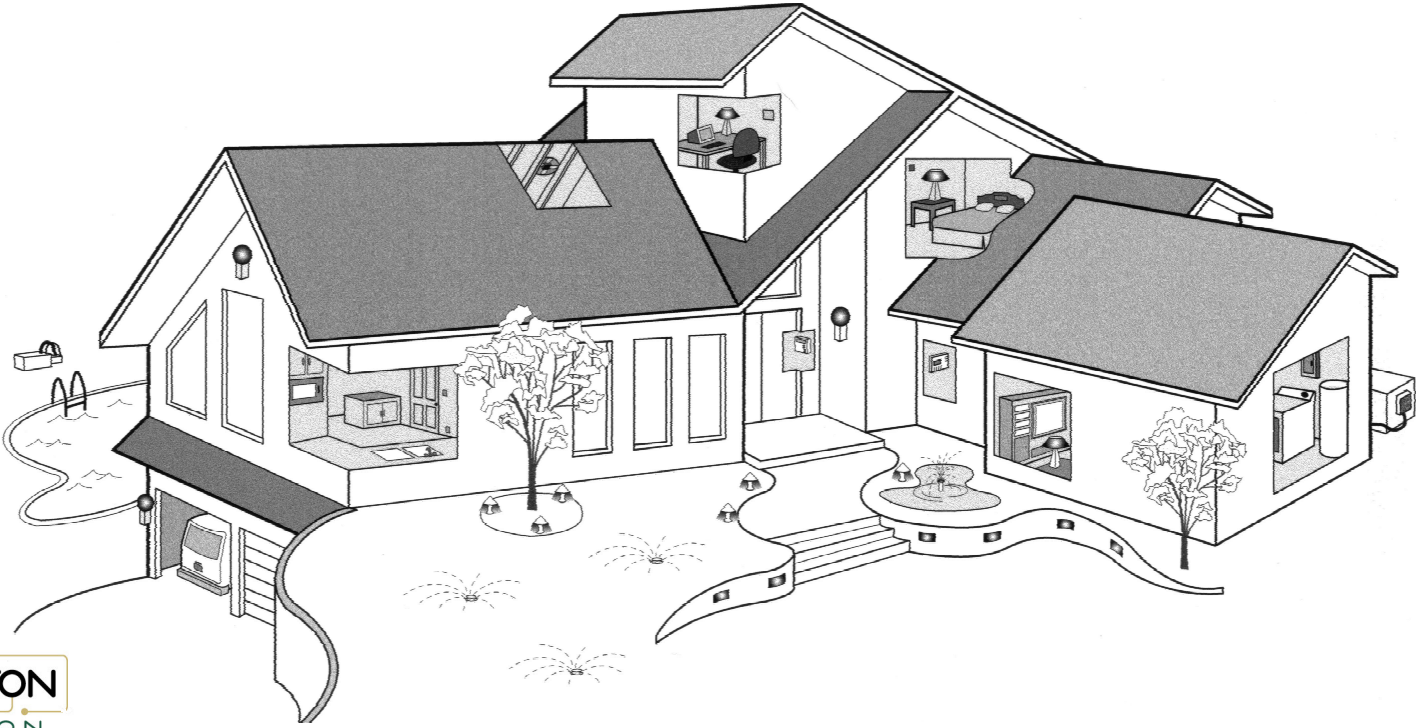




Class 106 HAI Home Lighting Control Setup and Installation



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Self Introductions



- Instructors
- Class Participants
 - Name
 - Company
 - Experience

What Is UPB?

- UPB is a new powerline communication standard for lighting and home control.
 - Signals travel over the existing wires in a home.
 - UPB is an open industry standard, supported by multiple manufacturers
- Used in commercial environments since 2001.
- Extensively testing in residential environments.
- UPB is designed to work in most houses without “conditioning”

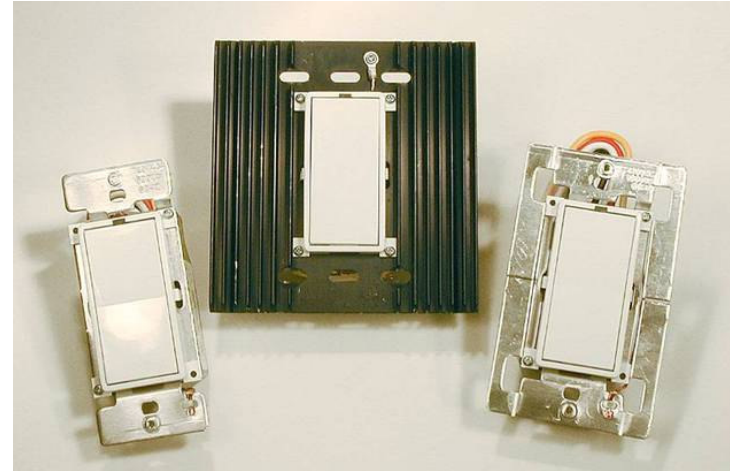


What Are Advantages of UPB?

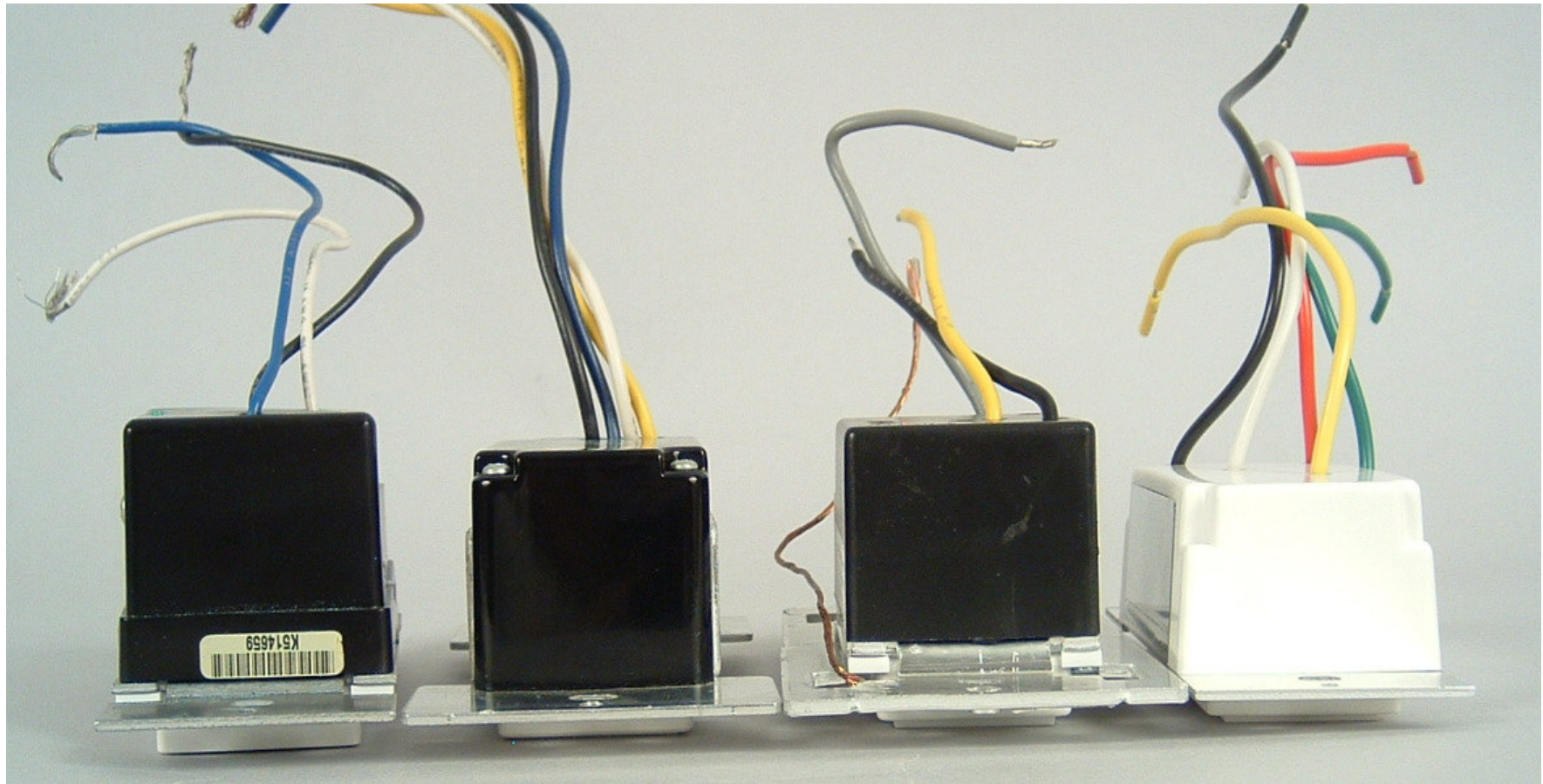
- Highly Reliable Communication
 - Reliable installations
 - Reduced callbacks
 - Professional lighting system quality and feel
- Advanced Addressing
 - 256 devices per house
 - 256 houses per transformer
- Long range
- All this means more profitable jobs with happier customers!

UPB Can Co-Exist with X-10™

- UPB and X-10 systems can coexist in the same house
- Both work over the power line at different frequencies and with different communication technologies
- The Omni II and OmniPro II can control UPB and X-10 simultaneously (in blocks of 16)
- Upgrade existing installations or take advantage of the thousands of existing X-10 compatible products



What Are Advantages of HLC?



Brand X

Brand Y

Brand Z



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Slimmer dimmers are easier to Install!

Components of HLC



Dimmers & Switches



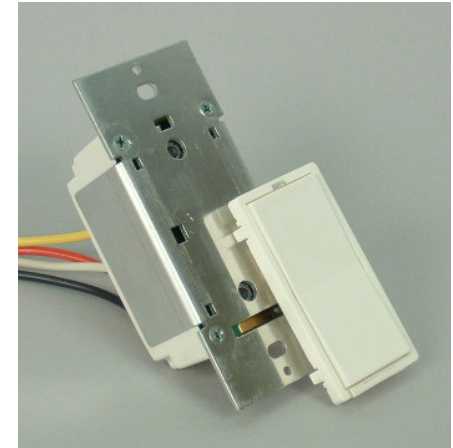
Room Controller



House Controller

HLC: Components

- 37A00-1: Auxiliary (Remote) Switch: for multi-switch applications
- Colors
 - All dimmers and switches ship with in white
 - Color change kits available for ivory, almond, brown, black and grey.
- Compatible with HAI Lighting and UPB modes
- 36A00-1: Power line Interface Module
- 39A00-1: Phase Coupler



HLC: Dimmers and Switches

- **Dimmers:** for control of incandescent, low voltage incandescent with magnetic transformers
- **Non-Dimming Solid State Switch:** for control of incandescent, low voltage incandescent with magnetic transformers
- **Relay:** for switching of compact fluorescent, fluorescent, incandescent, low voltage incandescent with electronic or magnetic transformers, neon, cold cathode, or general inductive loads
 - 600 Watt
 - 35A00-1: Dimmer
 - 35A00-3: Non-Dimming Solid State Switch
 - 1000 Watt (To Be Released later in 2005)
 - 35A00-2: Dimmer
 - 35A00-4: Non-Dimming Solid State Switch
 - 15 Amp (To Be Released Around August 2005)
 - 40A00-1: Relay



HLC: Room Controllers

- Room Controllers can be used to execute scenes, learn scenes, or dim/brighten
- Plug and Play Room Control with Omni Controllers when using HAI Lighting mode (no UpStart software required)
- If you wish, use UPB mode to write programs in Omni Controllers for specialty applications – Track status, individual load control
- Use UPB mode and UpStart software for more advanced applications
- Engraving available
- Compatible with HAI Lighting and UPB modes



HLC: House Controllers

- House Controllers can be used to track status, and control rooms
- Plug and Play House Control with Omni Controllers when using HAI Lighting mode (no UpStart software required)
- If you wish, use UPB mode to write programs in Omni Controllers for specialty applications – recall scenes, control loads or rooms other than those pre-defined by the controller
- Use UPB mode and UpStart software for more advanced applications
- Engraving available
- Compatible with HAI Lighting and UPB modes



HLC: Power Line Interface Module

- Plugs into HAI serial port
- Sends and receives UPB signals over the powerline
- Can also be connected to PC for advanced configuration of HLC system – Use UPStart and 36A05-2 PIM to PC Connector and Cable

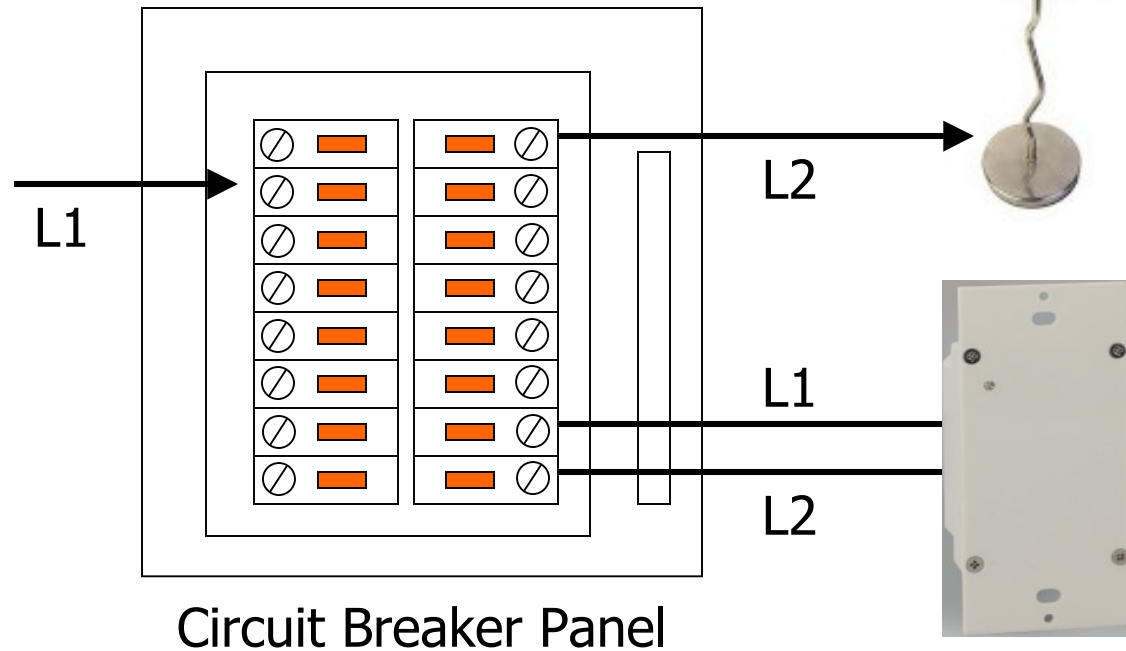


HLC: Phase Coupler

- UPB is for single phase 120/240 volt systems.
- Phase coupler connects signal from L1 to L2.
- LED shows its working
- Mounts by circuit breaker box



Controller and PIM



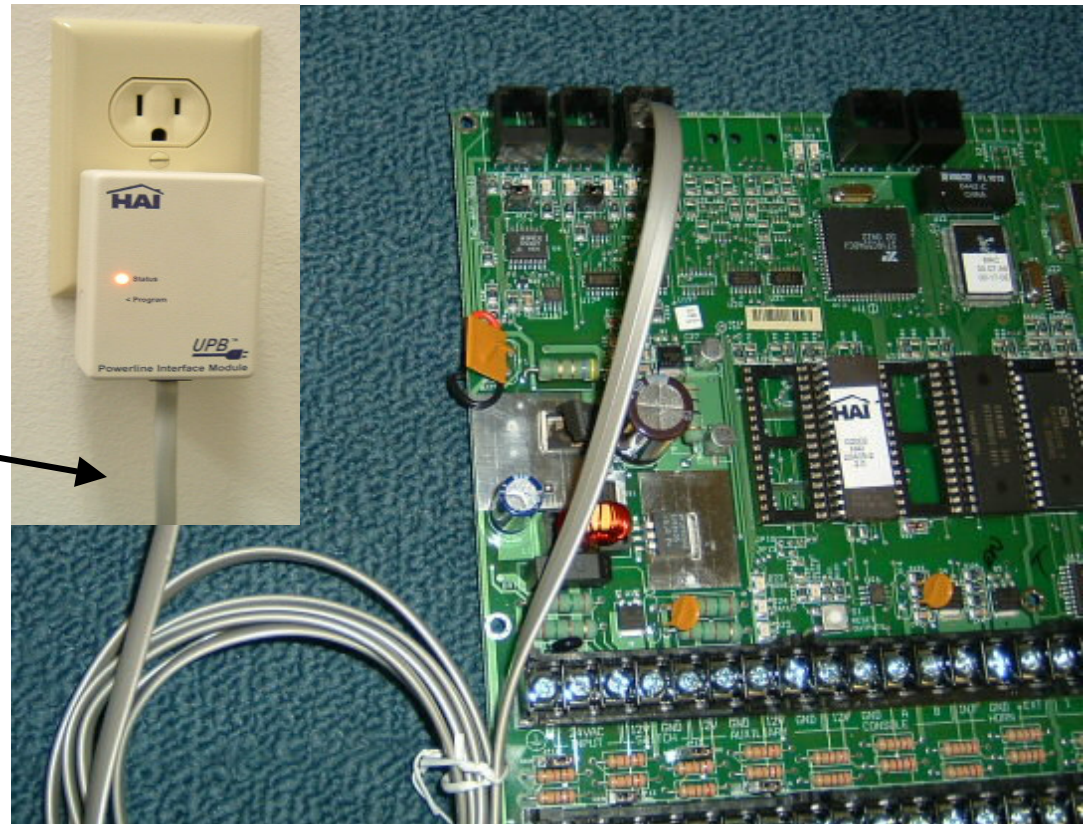
Circuit Breaker Panel

Phase Coupler

HLC: Getting Started: OmniPro II

- Plug PIM into outlet (not into surge suppressor)
- OmniPro II: Use 36A00-1 PIM and Cable
 - Recommended: Connect PIM Serial Port 3
 - Set any serial port function to UPB

6 Conductor Cable!

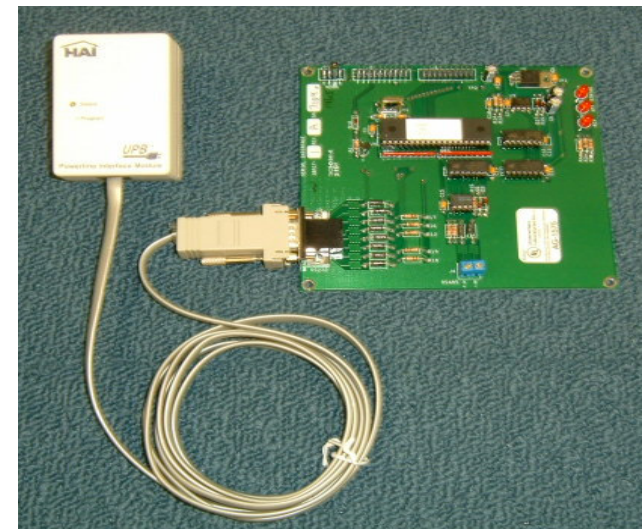


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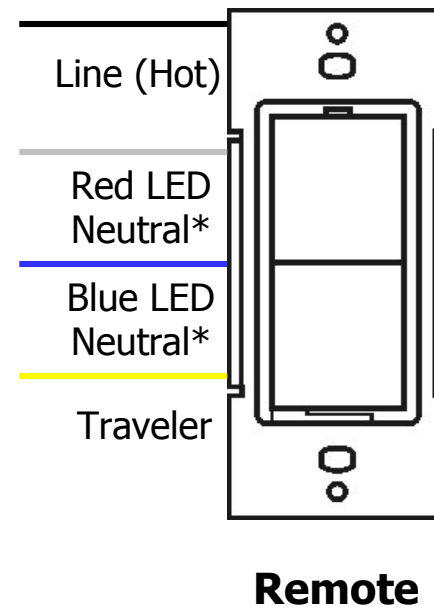
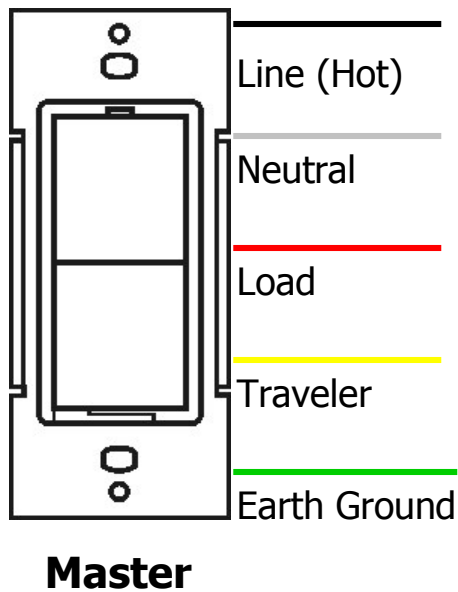
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HLC: Getting Started: Omni II/LT

- Plug PIM into outlet (not into surge suppressor)
- Set any serial port function to UPB
- Omni II/LT
 - **Option 1:** Use 36A00-1 PIM and Cable
 - An internal serial port can be used
 - Installer will have to switch between OmniLink and UPB serial modes when programming
 - **Option 2 (Recommended):** Use 36A10-1 HLC Kit
 - Kit Includes
 - 10A17-1 Serial Interface
 - 36A00-1 PIM and Cable
 - Allows serial programming of the controller while using the UPB interface

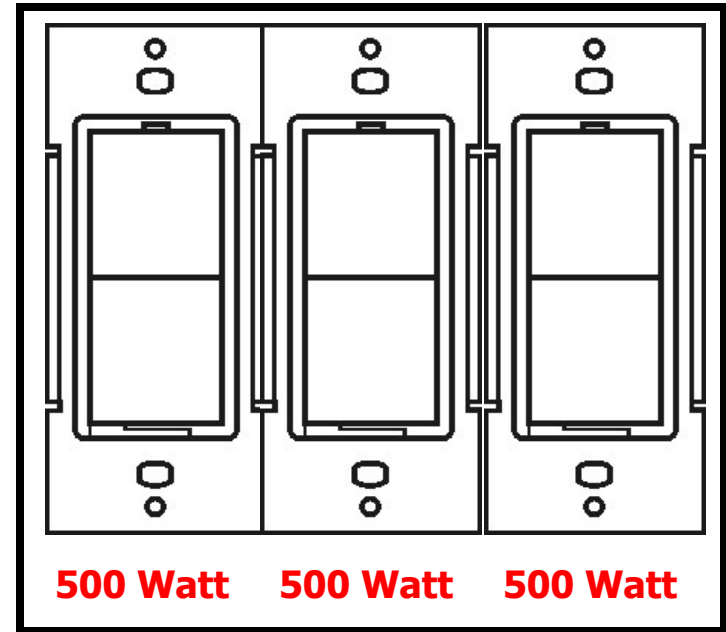
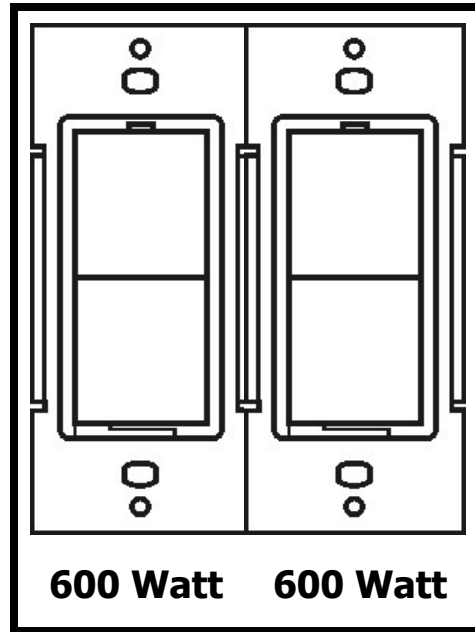
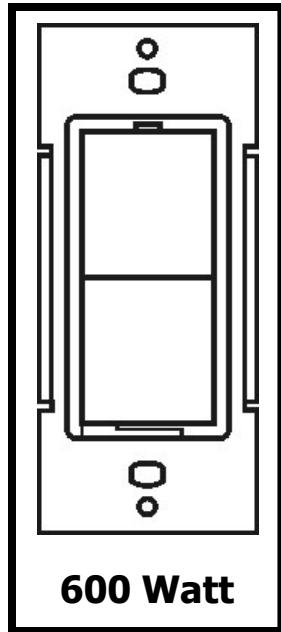


HLC: Wiring



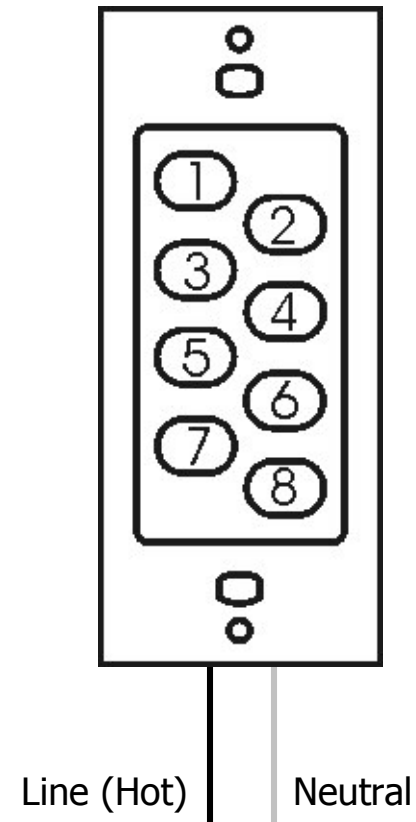
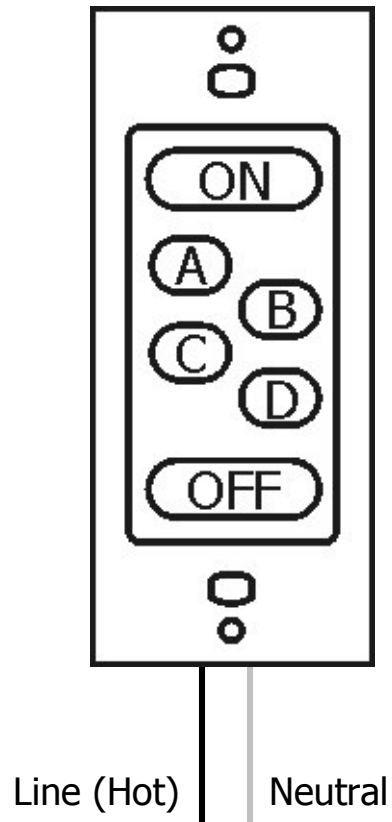
- Neutral LED connection is recommended
- Earth ground LED connection is permitted.
 - Connect Grey for a Red LED
 - Connect Blue for a Blue LED
 - Connect both a Magenta LED

HLC: Wattage De-Rating

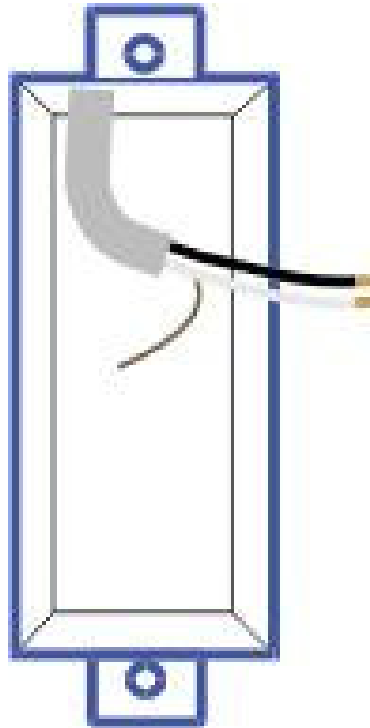


Note: This drawing assumes that all switches shown are HLC dimmers

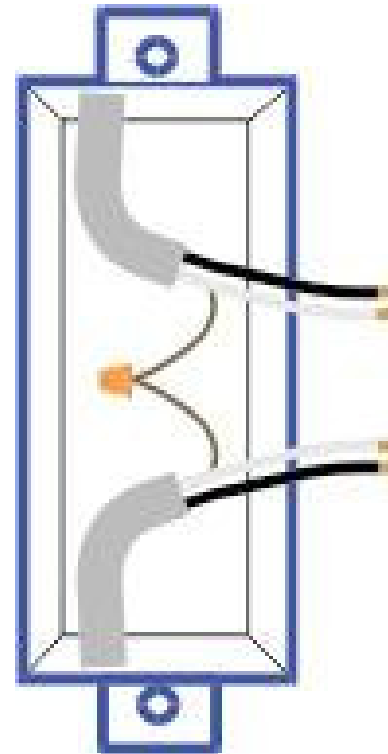
HLC: Room and House Keypads



HLC Retrofit: Neutral?

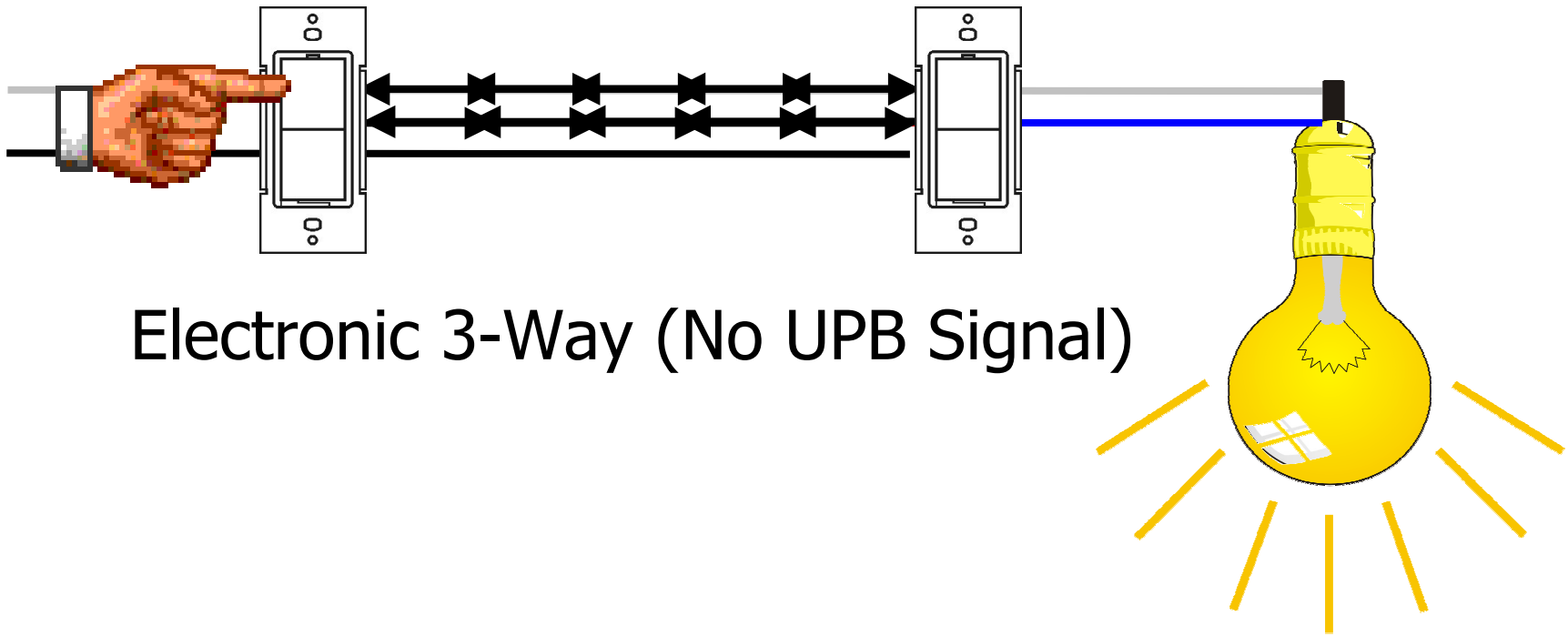


Switched Hot
(No Neutral)

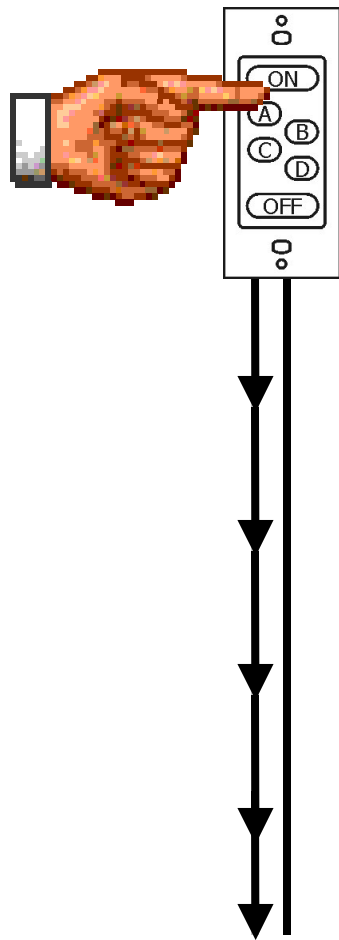


Line to The Box

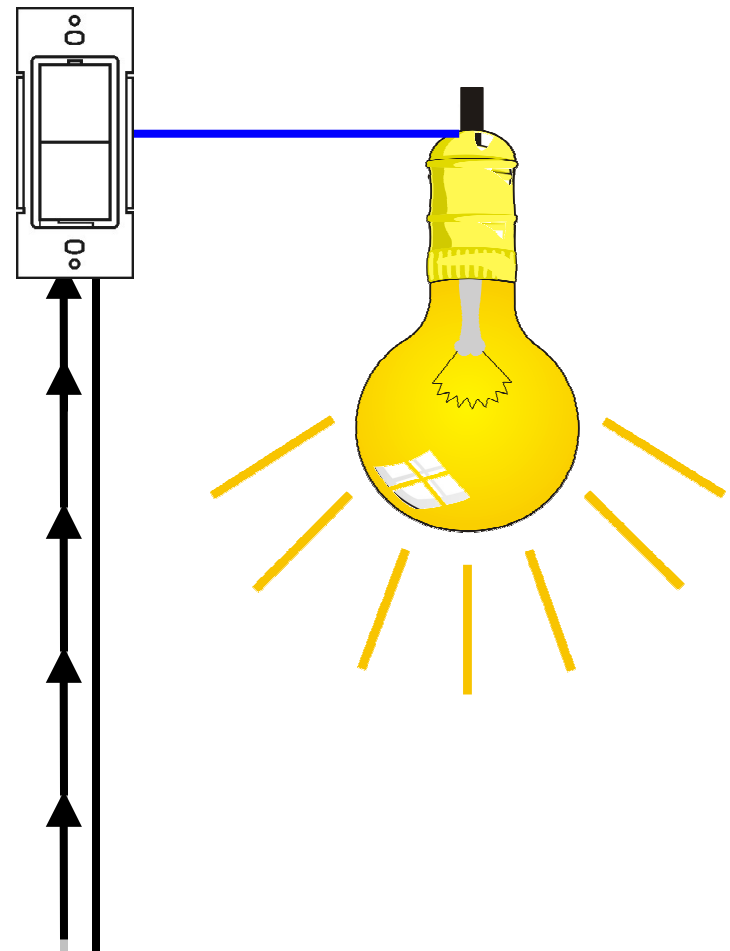
3 – Ways Circuits



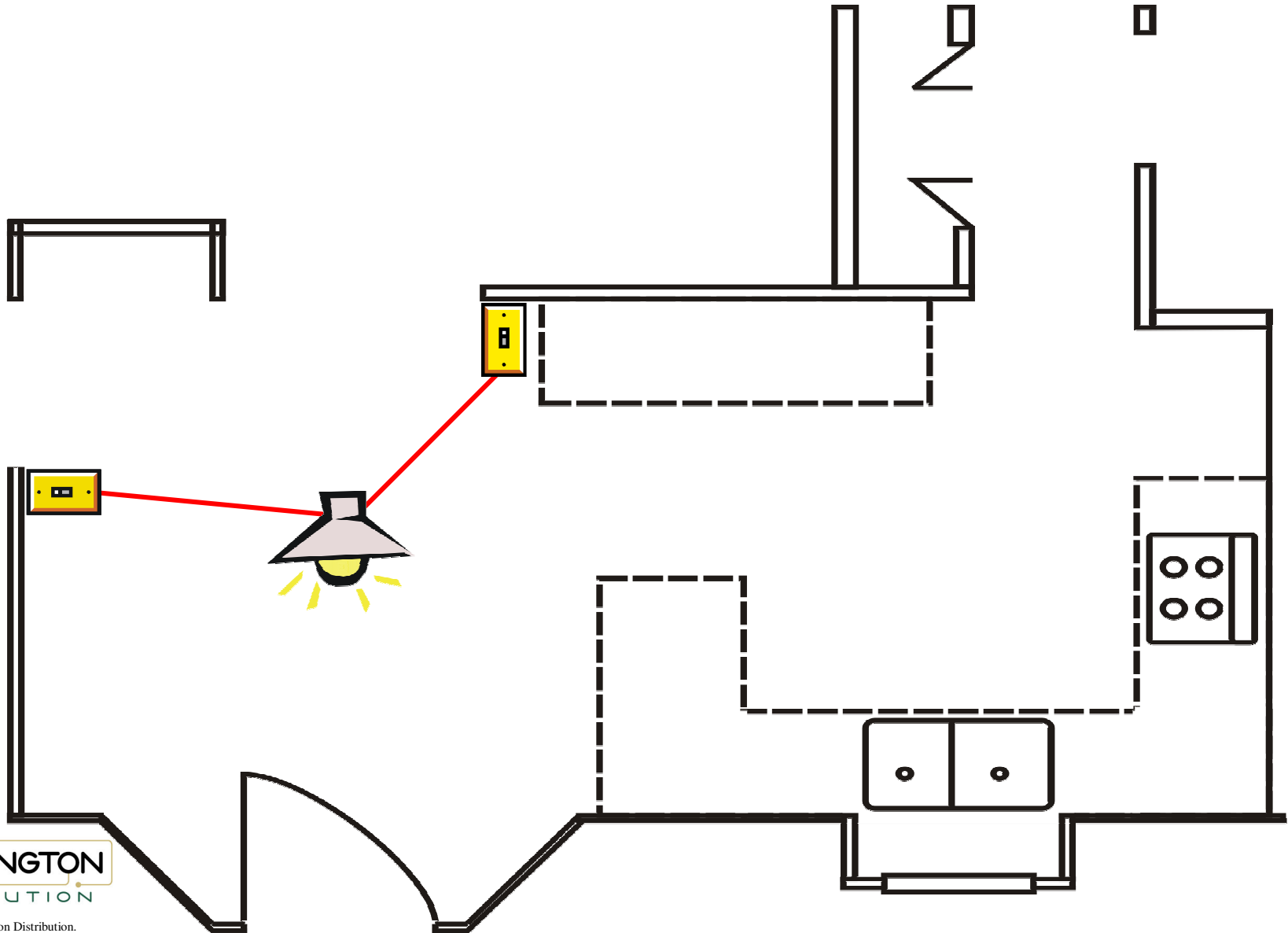
3 – Ways Circuits



'Virtual' 3-Way
Using UPB



HLC Retrofit: 3-Way Options

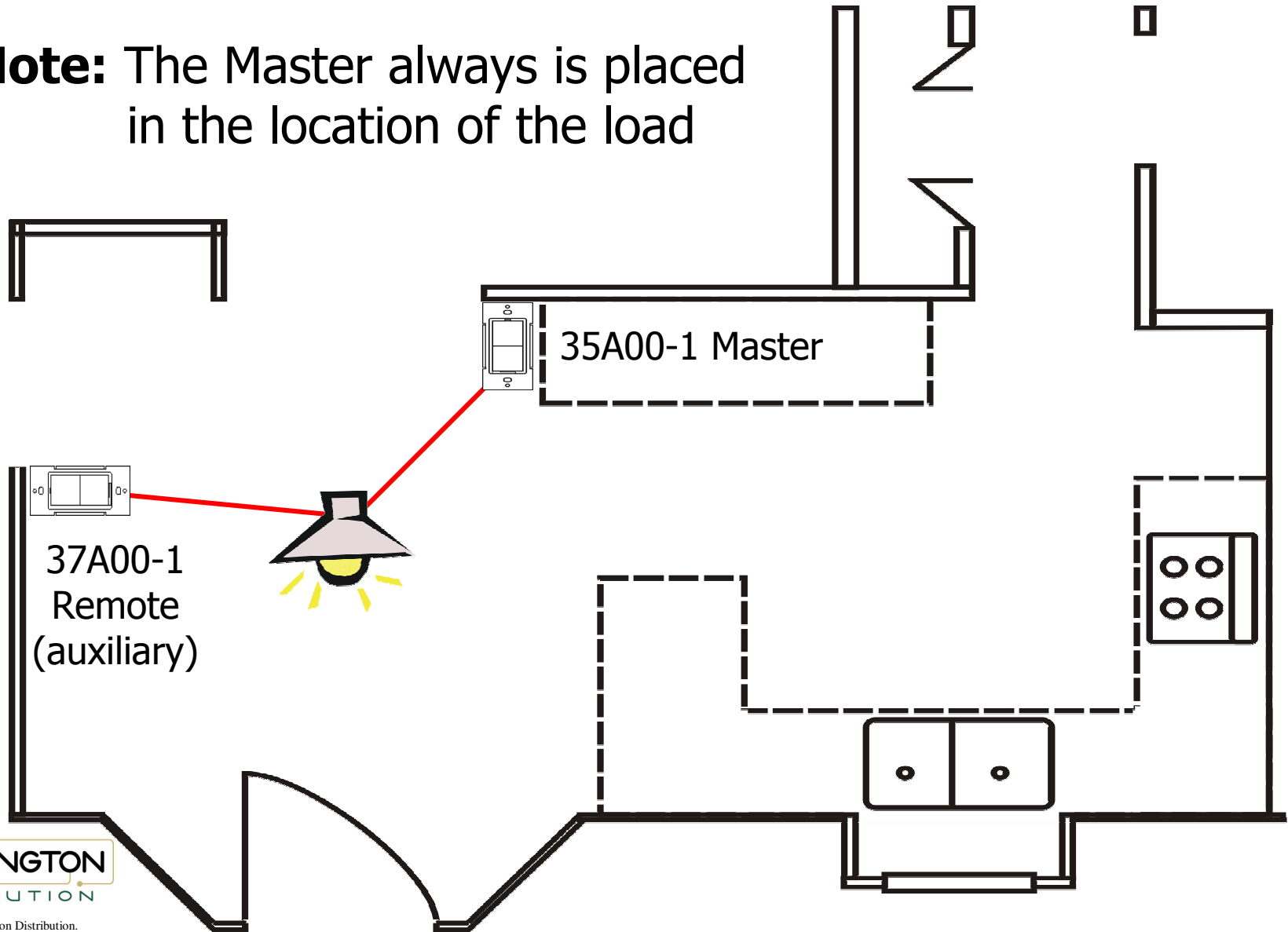


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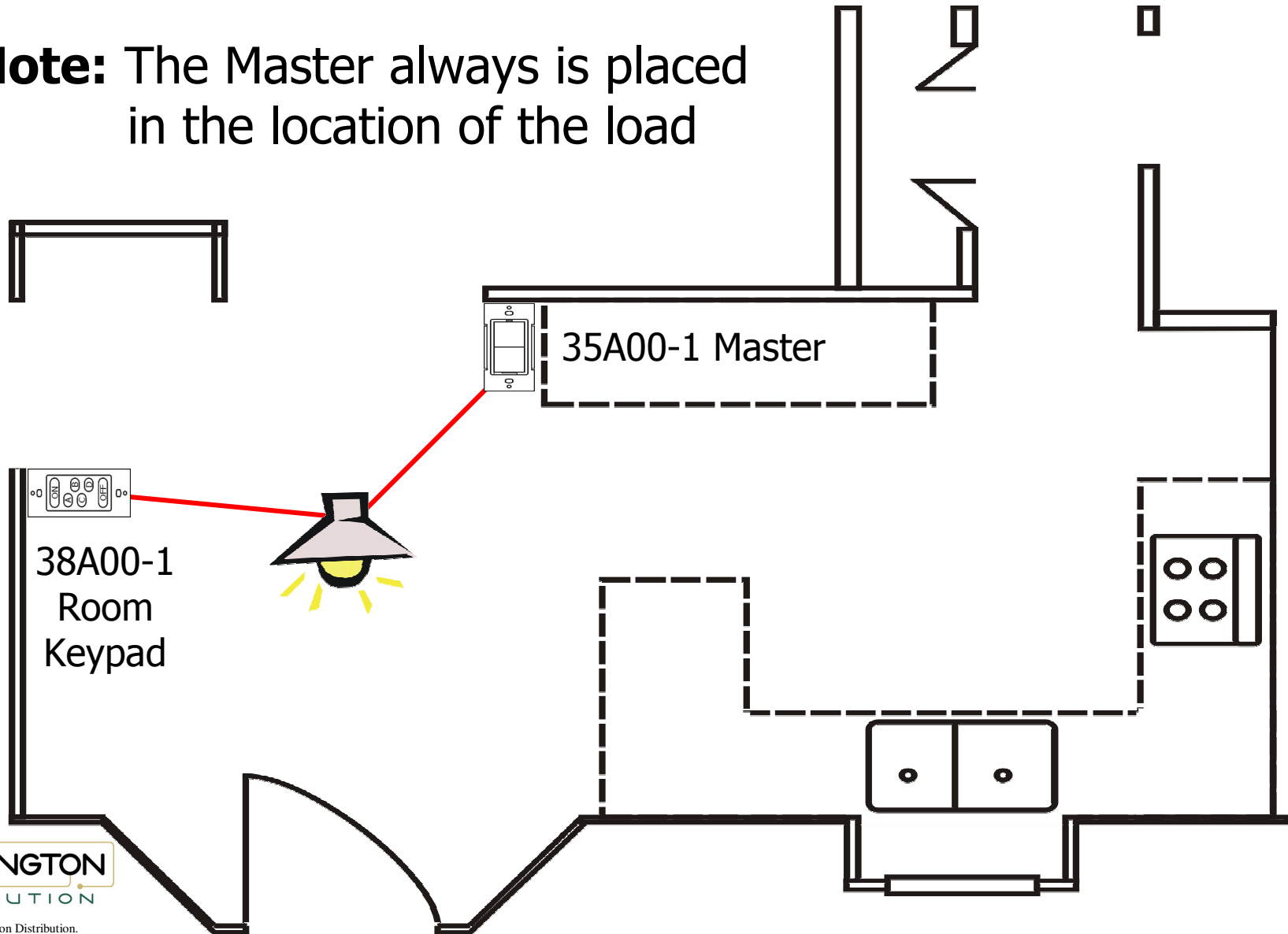
HLC: Break 3-ways Master / Remote

Note: The Master always is placed in the location of the load

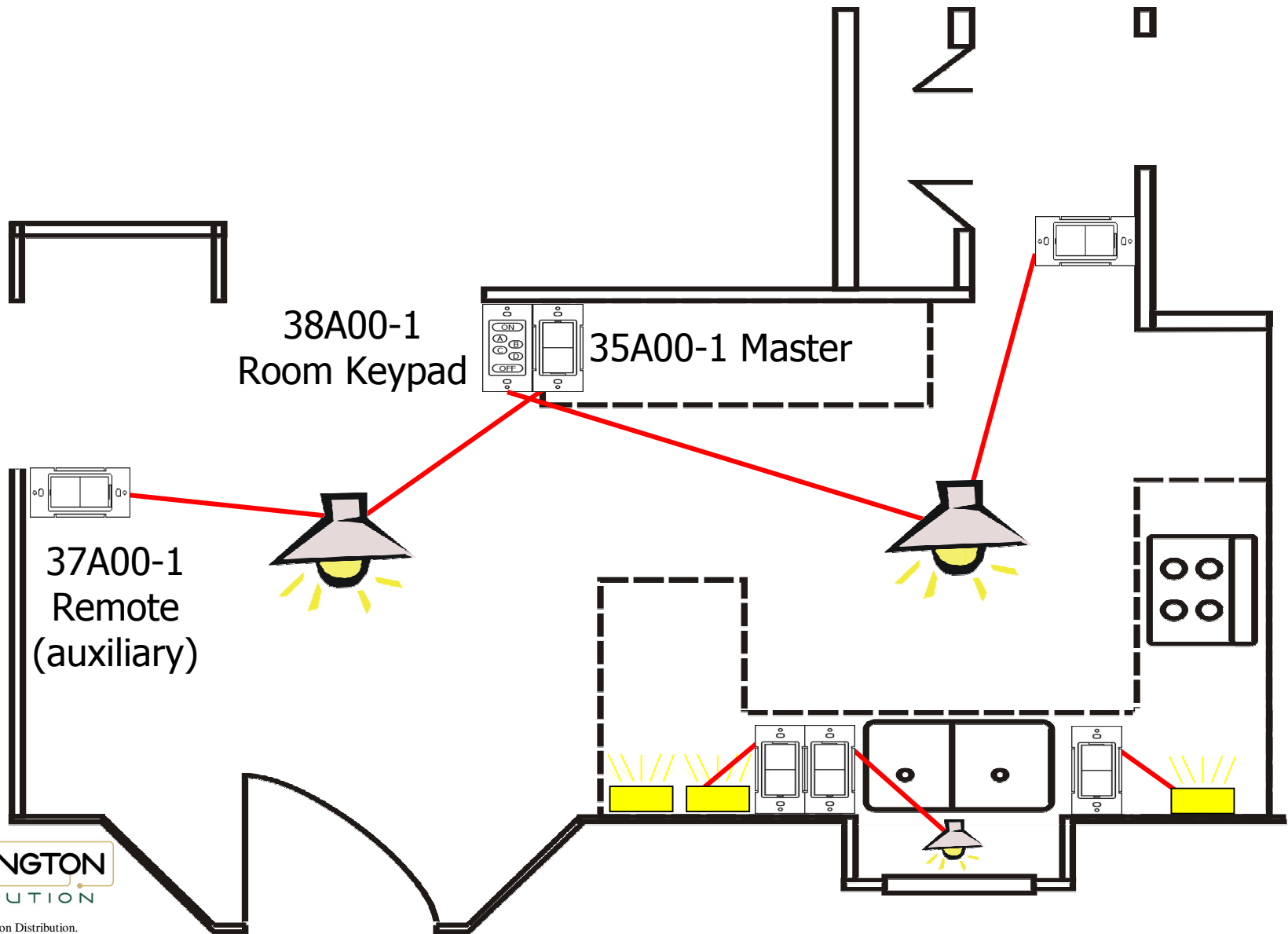


HLC: Break 3-ways Master / Keypad

Note: The Master always is placed in the location of the load

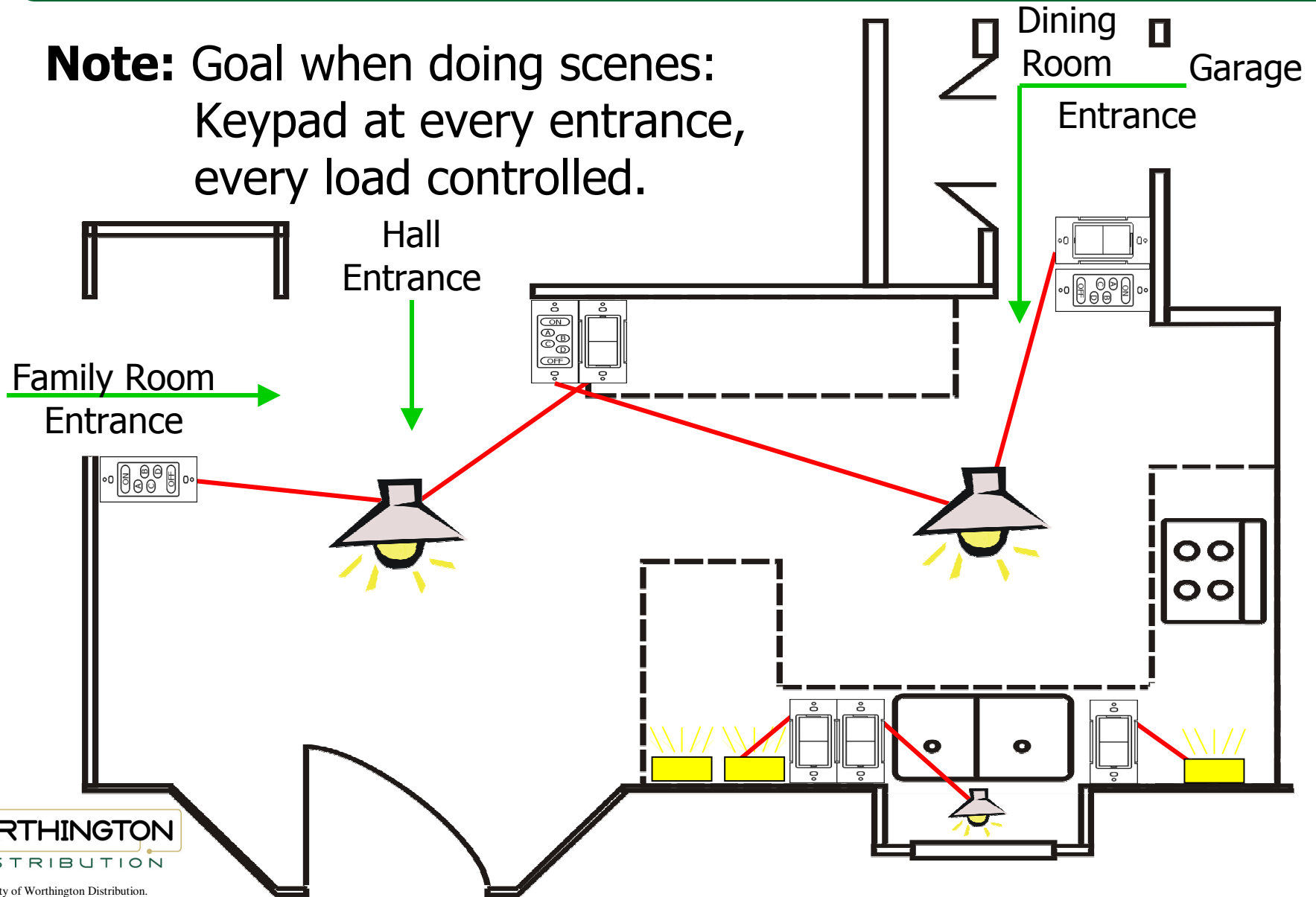


HLC: Master / Room Keypad

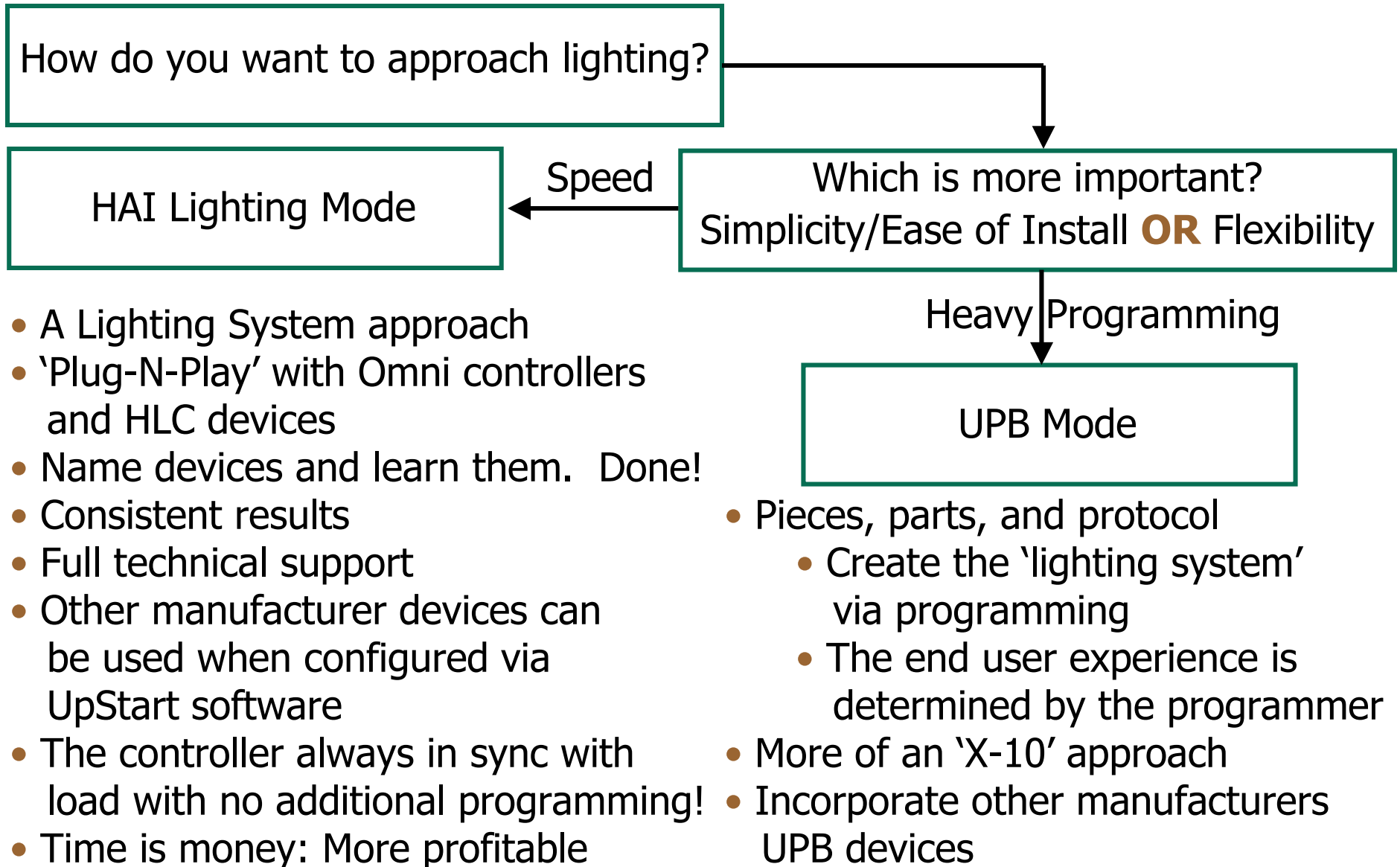


HLC: Example For Scene Design

Note: Goal when doing scenes:
Keypad at every entrance,
every load controlled.



HAI Lighting Versus UPB Mode



HAI Lighting Mode Overview

HAI Lighting Mode: A structured, easy to use method of setting up HLC Dimmers, Room Controllers and House Controllers with an HAI Omni-family controller.

Steps:

1. Install Devices
2. Name devices in the controller (PC Access recommended)
3. Initiate automated device configuration via a keypad
4. The system is ready to program schedules and macros

HLC: Naming Devices

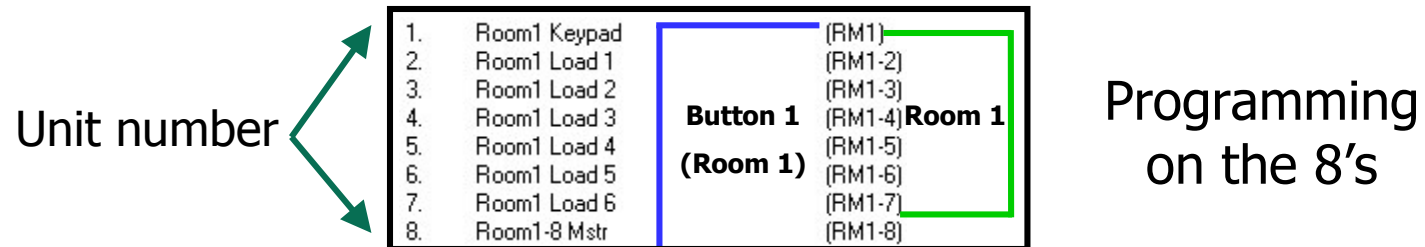
Assigning Names to the Correct Unit Numbers is Important!

The building blocks:

The screenshot shows the 'Setup Names / Voice' software interface. The 'Units' tab is active, displaying a list of units. A blue box highlights 'Button 1 (Room 1)' and 'Button 2 (Room 2)'. A green box highlights the unit list for 'Room 1' (RM1-1 to RM1-8). A brown box highlights the unit list for 'Room 2' (RM2-1 to RM2-8). A blue arrow points from the 'Unit name' field (containing 'UNIT 17') to the top keypad device. A green arrow points from the 'Unit voice' dropdowns to the middle keypad device. A blue arrow points from the 'Unit name' field to the bottom keypad device. The word 'Either' is written between the middle and bottom keypad devices.

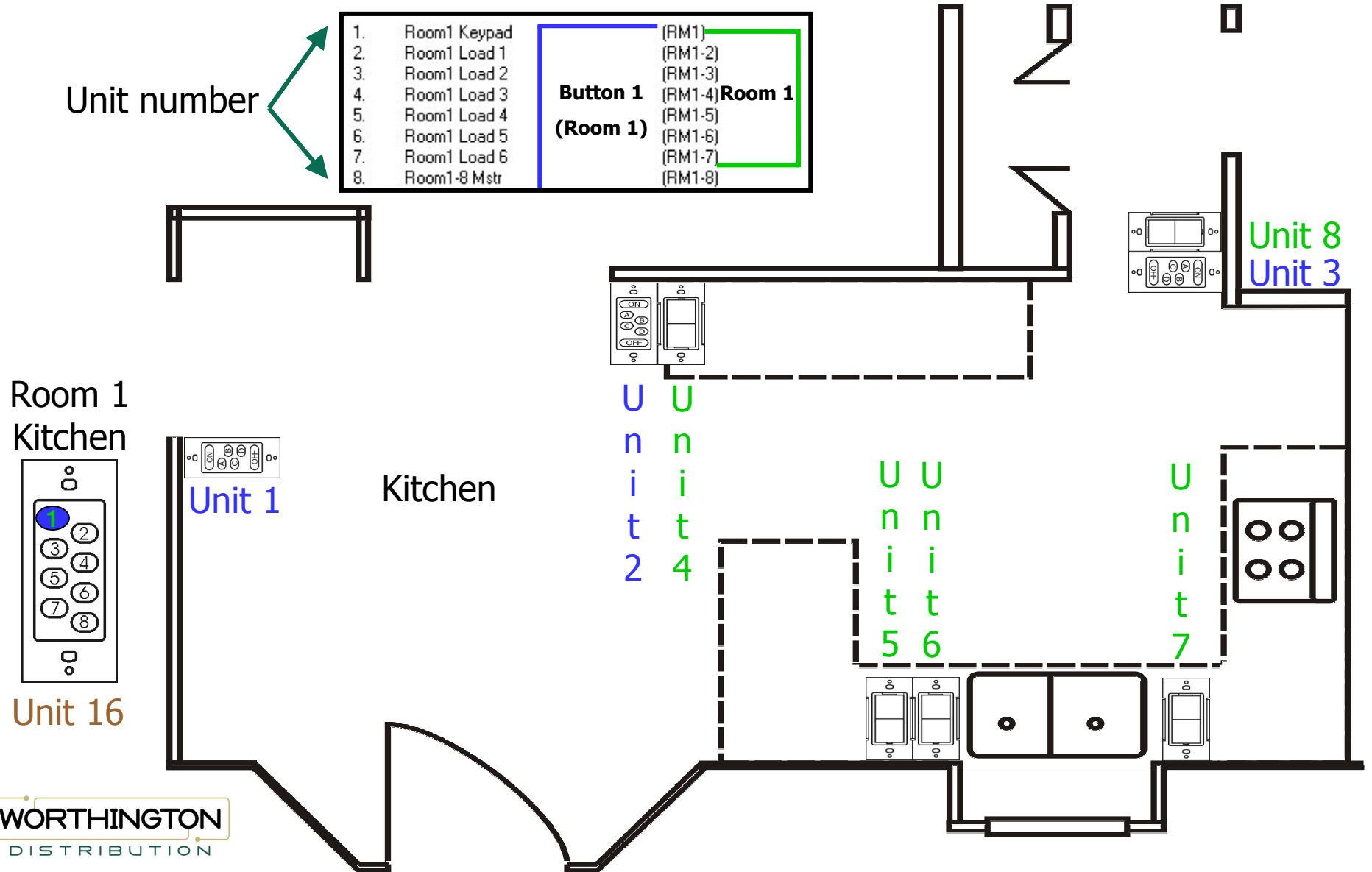
Unit Number	Unit Name
1.	Room1 Keypad (RM1)
2.	Room1 Load 1 (RM1-2)
3.	Room1 Load 2 (RM1-3)
4.	Room1 Load 3 (RM1-4)
5.	Room1 Load 4 (RM1-5)
6.	Room1 Load 5 (RM1-6)
7.	Room1 Load 6 (RM1-7)
8.	Room1-8 Mstr (RM1-8)
9.	Room1 Load 1 (RM2)
10.	Room2 Load 2 (RM2-2)
11.	Room2 Load 3 (RM2-3)
12.	Room2 Load 4 (RM2-4)
13.	Room2 Load 5 (RM2-5)
14.	Room2 Load 6 (RM2-6)
15.	Room2 Load 7 (RM2-7)
16.	Room1-8 Mstr (RM2-8)
17.	UNIT 17 (RM1 / RM1.17)

HLC: Naming Devices

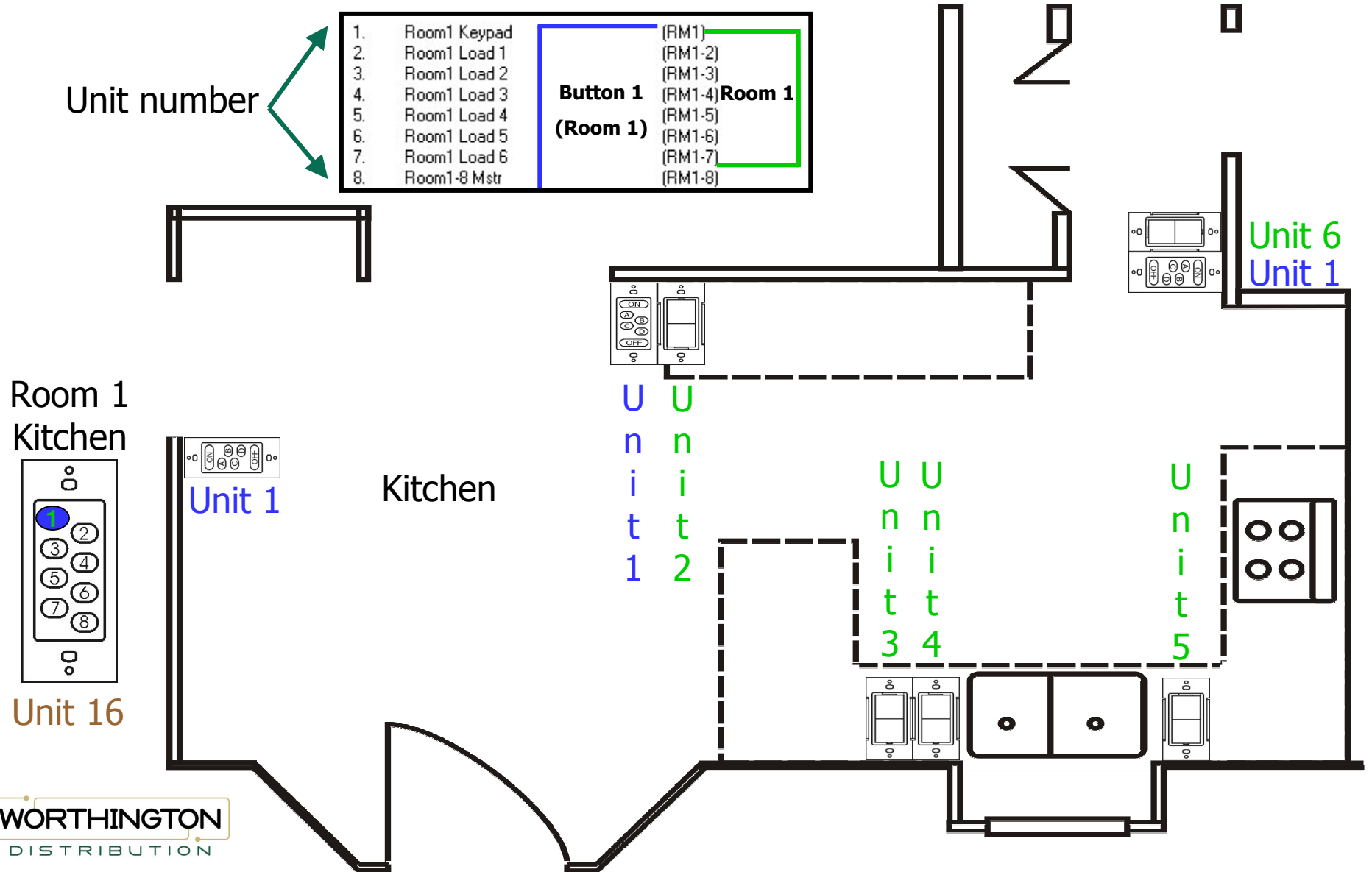


- The first unit in the room is typically a room keypad
- The second through eighth units are typically additional room keypads or keypad/dimmers
 - **Multiple** room keypads can be assigned to the first unit
 - It does work. It technically is not endorsed by the UPB protocol
 - They MUST be programmed one at a time
 - Multiple switches/dimmers can't be on the same address
- A whole house controller may be learned into the 8th unit of a room

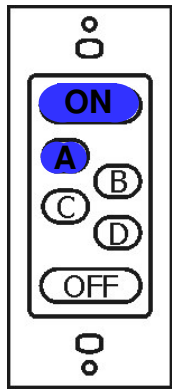
HLC Room Example: Separate Units



HLC Room Example: Keypads - 1 Unit

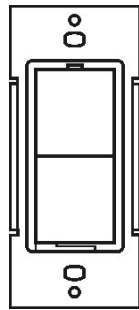


HLC: Room Control

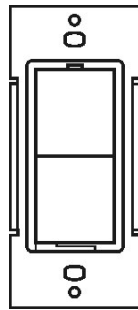


**Kitchen Room
Controller**

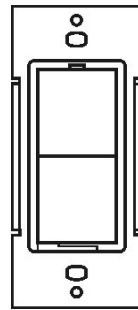
Overhead



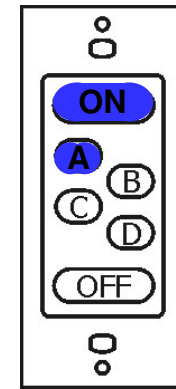
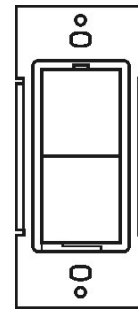
Table



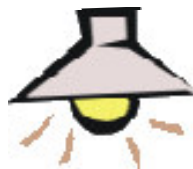
Counter



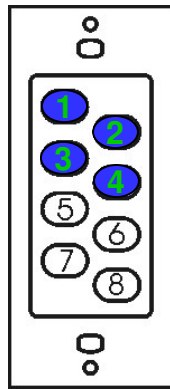
Overhead



**Kitchen Room
Controller**

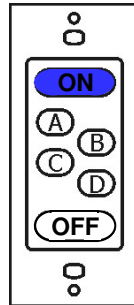


HLC: House Controller

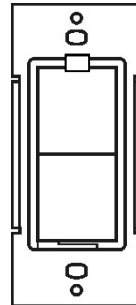


**Kitchen Room
Controller**

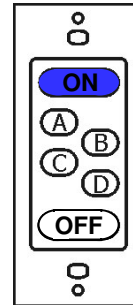
Kitchen



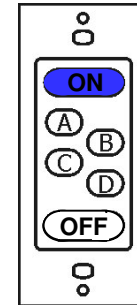
Spots



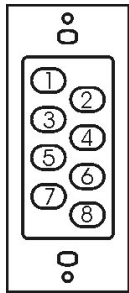
Family



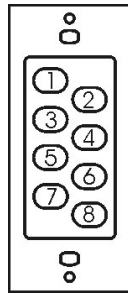
Living



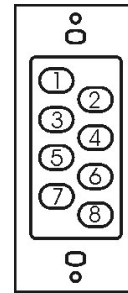
HLC: House Controller Groups



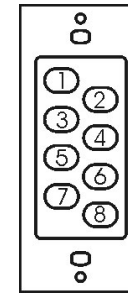
Keypad Group 1



Keypad Group 2



Keypad Group 3

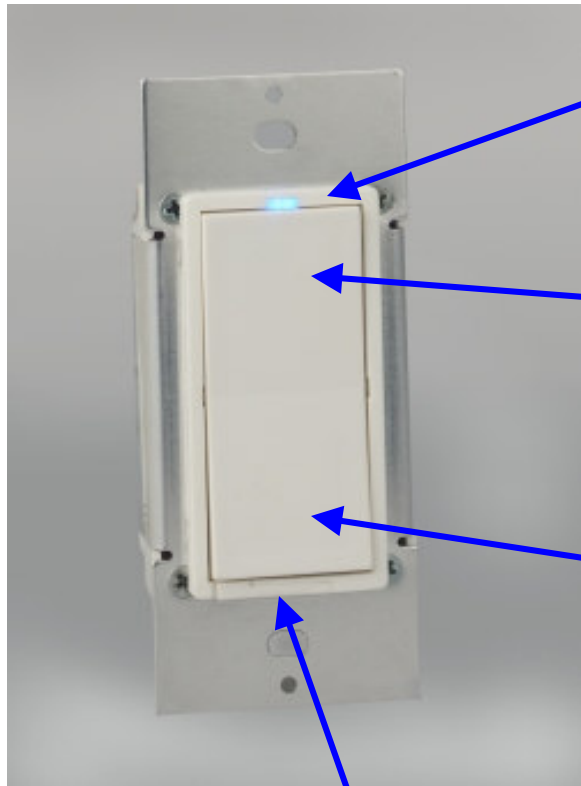


Keypad Group 4

Button 1	Button 2	Button 3	Button 4	Button 5	Button 6	Button 7	Button 8
Units 1 - 8 1	Units 9 - 16 2	Units 17 - 24 3	Units 25 - 32 4	Units 33 - 40 5	Units 41 - 48 6	Units 49 - 56 7	Units 57 - 64 8
Units 65 - 72 9	Units 73 - 80 10	Units 81 - 88 11	Units 89 - 96 12	Units 97 - 104 13	Units 105 - 112 14	Units 113 - 120 15	Units 121 - 128 16
Units 129 - 136 17	Units 137 - 144 18	Units 145 - 152 19	Units 153 - 160 20	Units 161 - 168 21	Units 169 - 176 22	Units 177 - 184 23	Units 185 - 192 24
Units 193 - 200 25	Units 201 - 208 26	Units 209 - 216 27	Units 217 - 224 28	Units 225 - 232 29	Units 233 - 240 30	Units 241 - 248 31	

The **Colored** numbers in **bold** represent the unit numbers for house controllers. Each Keypad Group can have up to 8 controllers showing status and controlling up to 8 rooms (group 4 is 7 rooms and 7 controllers).

HLC: Control Defaults



LED Indicator

- Blue
- On when load is Off
- Off when load is On

Top

- Tap – Ramp to 100%
- Double Tap – Instant 100%

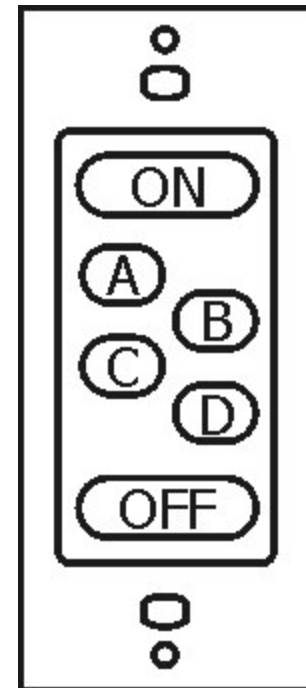
Bottom

- Tap – Ramp Off
- Double Tap – Instant Off

Air Gap Lever

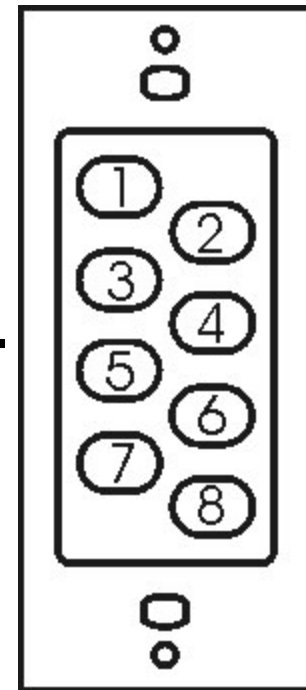
HLC: Using HLC – Scenes

- Using a Room Controller
 - On - Room On
 - Off – Room Off
 - A-D – Scenes
 - Push and hold On – Brighten
 - Push and hold Off – Dim
- Setting a Scene:
 - Push Scene button
 - Adjust room dimmers as desired
 - Push Scene button five times – lights blink.
 - Scene is learned

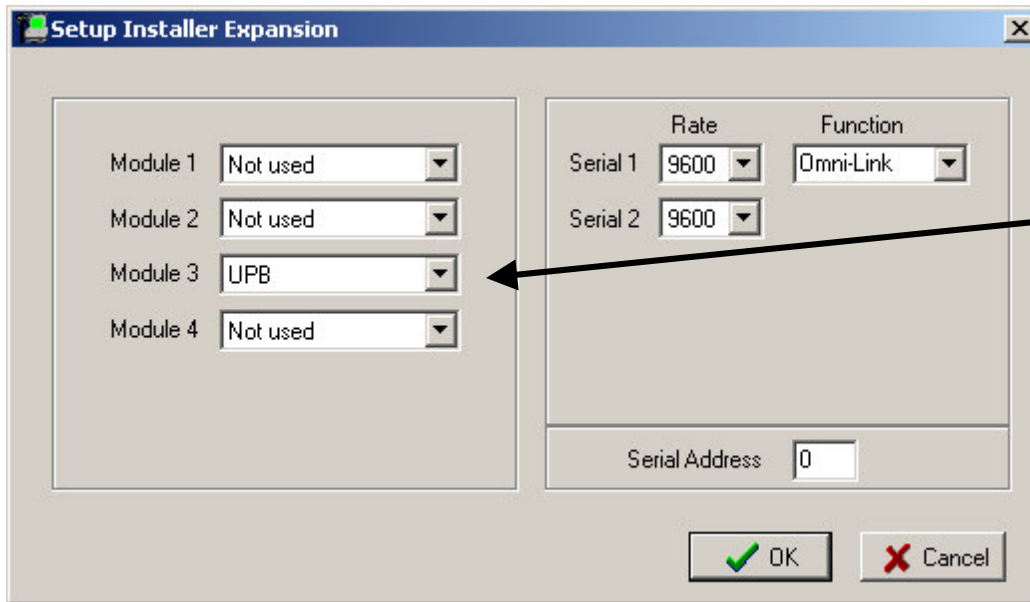


HLC: Using HLC – House Controller

- If button is lit, one or more lights in the room is on. Push to turn room lights off.
- If button is not lit, all lights in the room are off. Push to turn room lights on.
- Ideal for master control of lighting in master bedroom, by entry door, garage, etc.



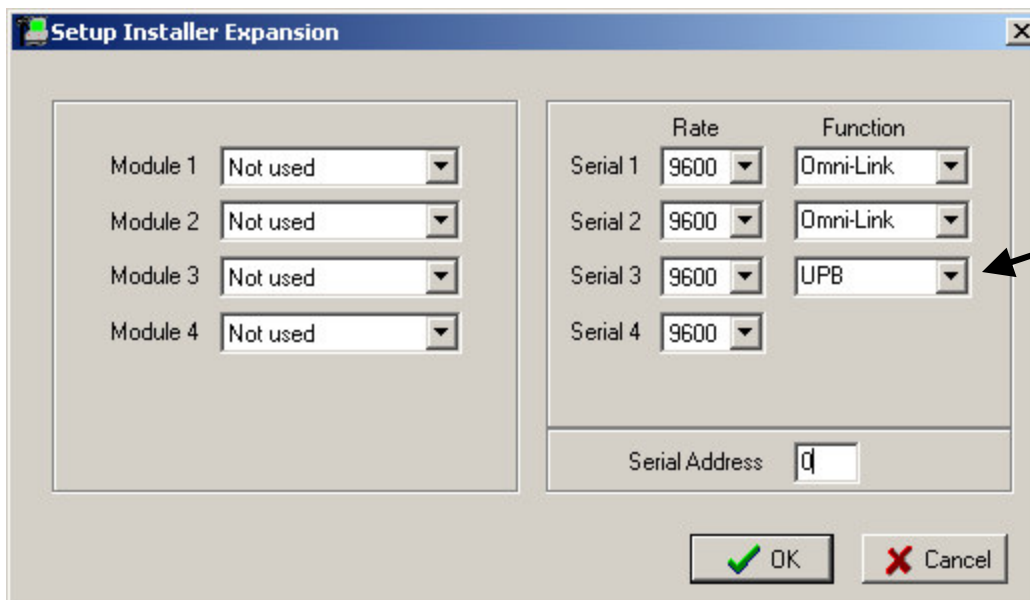
HLC: Programming Devices



OmniLT's and Omni II's

Turn On UPB in
Setup / Installer / Expansion

Use 36A10-1 PIM Kit. Set the 10A17-1
Serial Interface to UPB



Omni Pro II's

Use internal serial port 3 and the
36A00-1 PIM Kit. Set the port to UPB

HLC: Set Address

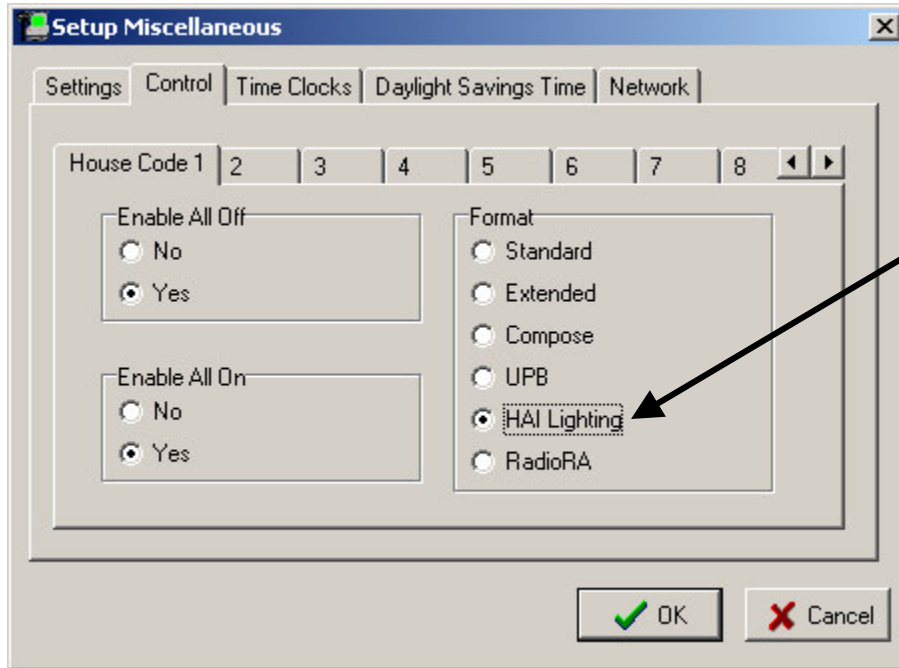
The screenshot shows the 'Setup Installer Control' window with the following settings:

- House code: A
- X-10 3-Phase: No, Yes
- UPB Network:
 - Address: 1
 - Password: 1234
- UPB Status Time: 5
- Output types:
 - Output 1: General purpose
 - Output 2: General purpose
 - Output 3: General purpose
 - Output 4: General purpose
 - Output 5: General purpose
 - Output 6: General purpose
 - Output 7: General purpose
 - Output 8: General purpose
 - Interior Horn: Interior sounder
 - Exterior Horn: Exterior sounder

Buttons: OK, Cancel

Set the Address and Password for your UPB network in Setup / Installer / Control

HLC: Choose HAI Lighting Mode



Set HAI Lighting in
Setup / Miscellaneous

- House Code 1 – Units 1-16
- House Code 2 – Units 17-32
- House Code 3 – Units 33-48
- House Code 4 – Units 49-64
- House Code 5 – Units 65-80
- House Code 6 – Units 81-96
- House Code 7 – Units 97-112
- House Code 8 – Units 113-128
- House Code 9 – Units 129-144
- House Code 10 – Units 145-160
- House Code 11 – Units 161-176
- House Code 12 – Units 177-192
- House Code 13 – Units 193-208
- House Code 14 – Units 209-224
- House Code 15 – Units 225-240
- House Code 16 – Units 241-248

Note: Other technologies can be mixed with HLC Lighting as long as the alternate technology is not trying to use units in the the same house code

HLC: Capacities / Download

- OmniLT: 14 loads, 2 room controllers
- Omni II: 56 loads, 8 room controllers
- OmniPro II: 217 loads, 31 room controllers

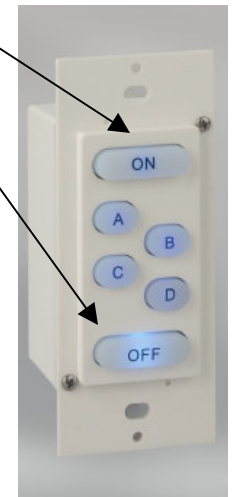
**When units are named, serial mode is set,
and house codes are in HAI Lighting Mode:**

Download!

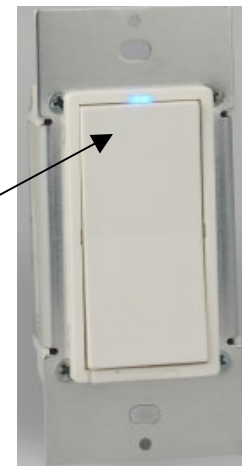
HLC: Entering Setup Mode

- Put device in "set-up" mode (program only one device at a time)
- Dimmers and Switches:
 - Press 'On' 5 times in a row
 - LED will blink to show set up mode
- Room and House controllers:
 - Press and Hold Top and Bottom buttons until they all flash
- No need to disassemble switch or remove cover plate.

Press and hold top and bottom until LED blinks

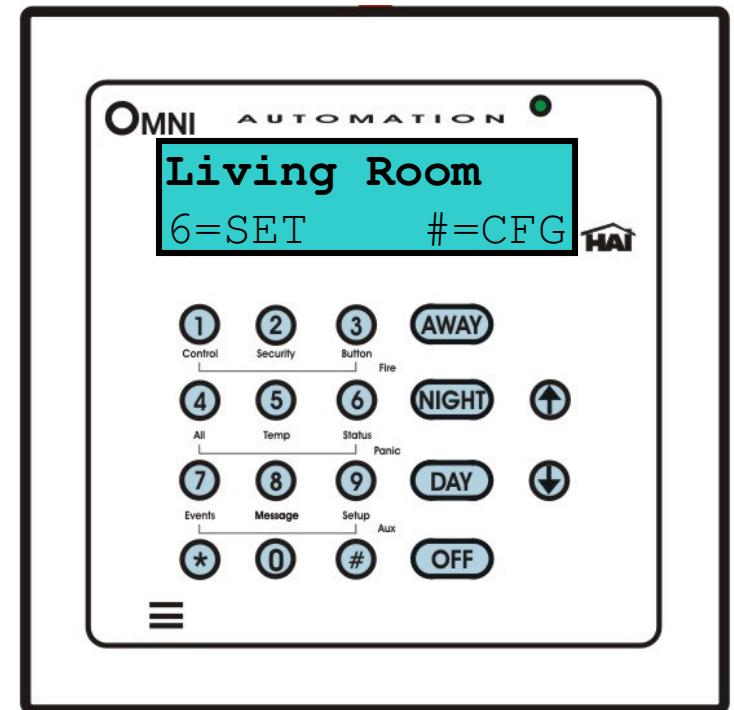


Click switch 5 times. LED blinks






HLC: Configuration Console

- Download Names from PCAccess
- On Console:
 - 6 Status
 - 1 Control
 - Scroll to unit name (or enter number) followed by #
 - # to configure (CFG)
- Controller sends address, names and links to switch
 - Process takes approximately 30 seconds
 - Returns to device selection when done
- Repeat for each device (one at a time)
- Configuration can only be used with HAI HLC devices



HLC: Configuration OmniTouch

- Download Names from PCAccess
- On Touch Screen Tap:
 - Status 
 - Control 
 - Choose the unit
 - Configure 
 - Controller sends address, names and links to switch
 - Process takes approximately 30 seconds
 - Exits setup when done
- Repeat for each device (one at a time)
- Configuration can only be used with HAI HLC devices



Defaulting Devices

- When using HLC mode, repeat the 'Configure' Process
- Restoring Factory Default
 - Dimmers
 - Tap the rocker 5 times
 - The load will blink
 - LED will continually blink blue
 - Tap the rocker 10 times
 - The load will blink
 - LED will continually blink red
 - Tap the rocker 2 times
 - 6 Button Keypads
 - Hold On and Off for 3 seconds
 - All LEDs will blink
 - Hold A and D for 3 seconds
 - 8 Button Keypads
 - Hold 1 and 8 for 3 seconds
 - All LEDs will blink
 - Hold 2 and 7 for 3 seconds

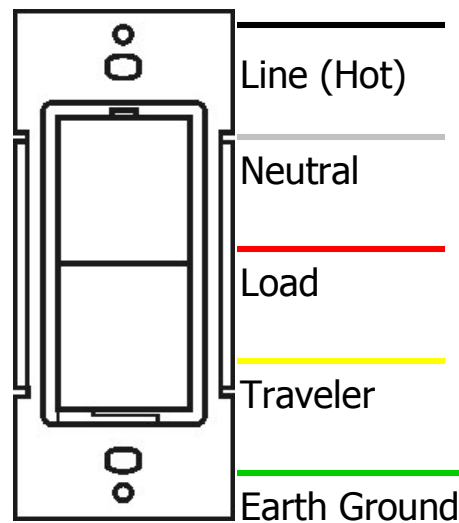


Multi-Switch Circuit Drawings For HLC Dimmers

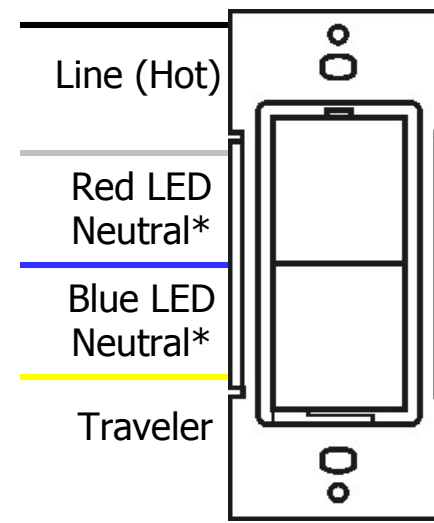
*Note: This document is **NOT** a replacement or addendum to manufacturers supplied documentation. This document is to help installers conceptualize electronic 3-Way and 4-Way circuits*

Electronic 3-Way Concepts

HAI has a traditional approach to 3-way and 4-way master dimmer designs. HLC dimmers **MUST** have a neutral at the location of the master dimmer. In addition, the remote (37A00-1) auxiliary switch must be wired across ‘traveler and hot’. In most applications the master dimmer is placed in the junction box location containing the load.



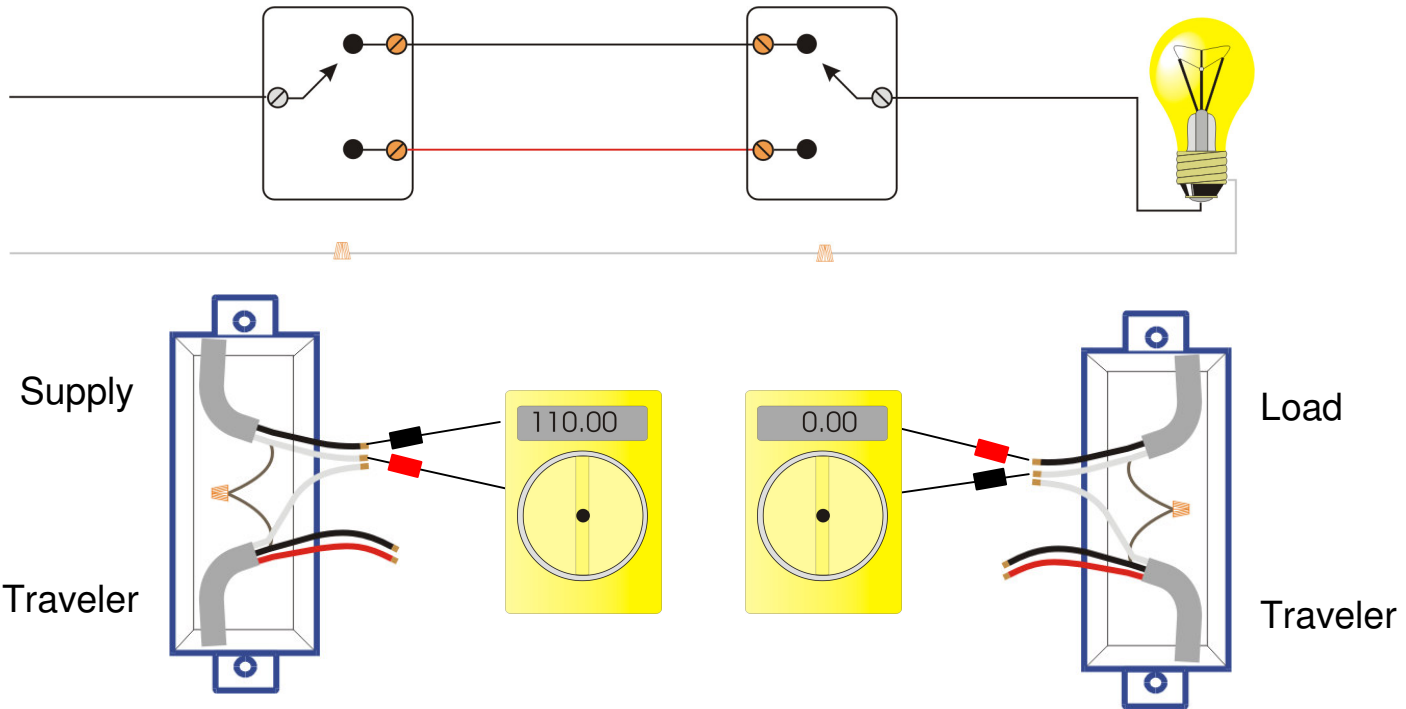
Master



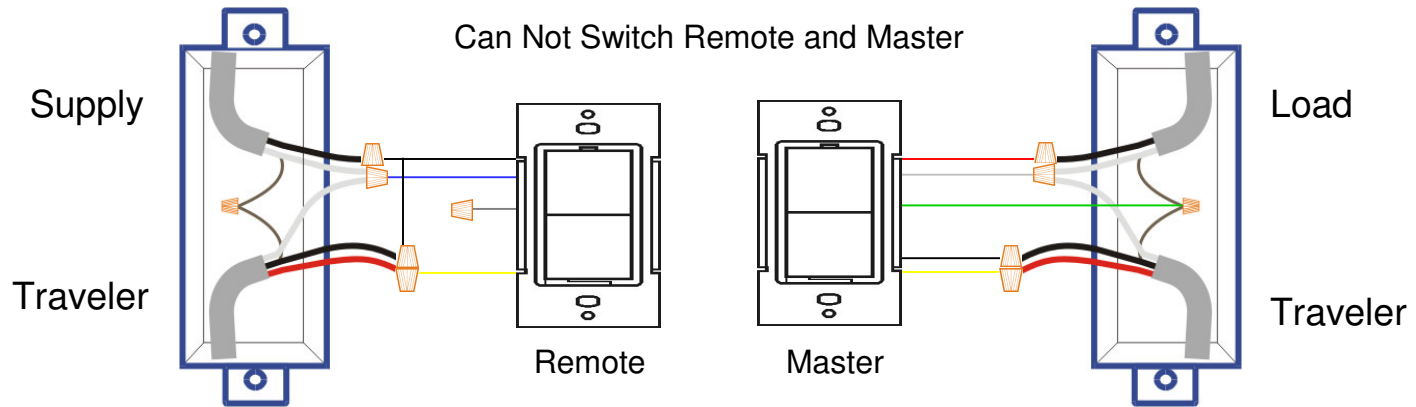
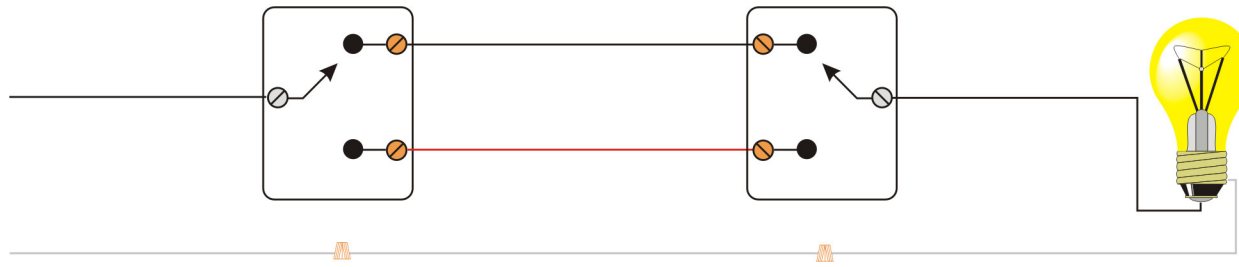
Remote

- Neutral LED connection is recommended
- Earth ground LED connection is permitted.
 - Connect Grey for a Red LED
 - Connect Blue for a Blue LED
 - Connect both a Magenta LED

3 - Way Circuits – Method 1

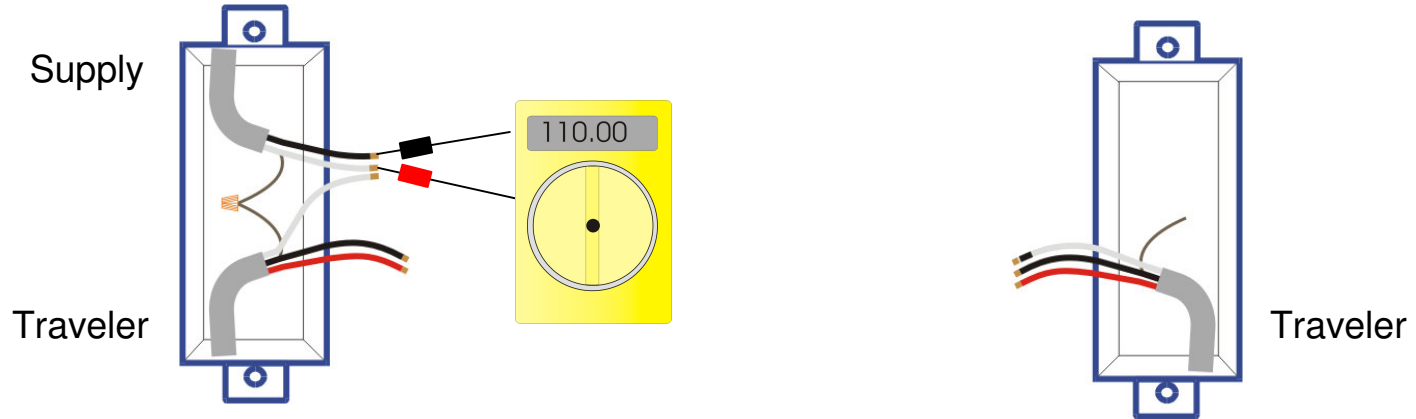
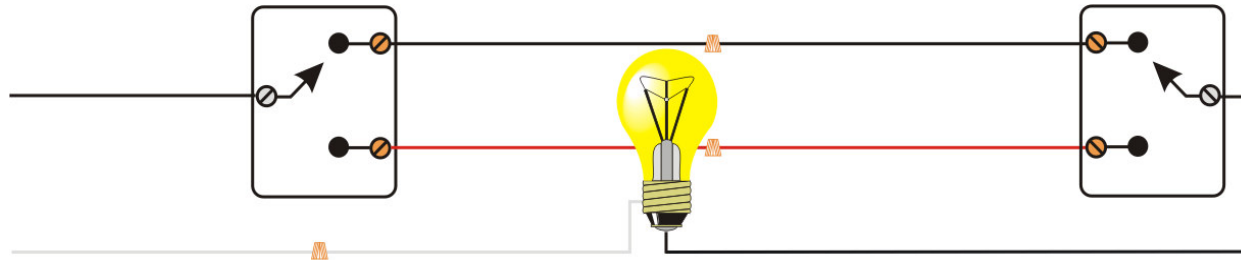


3 - Way Circuits – Method 1

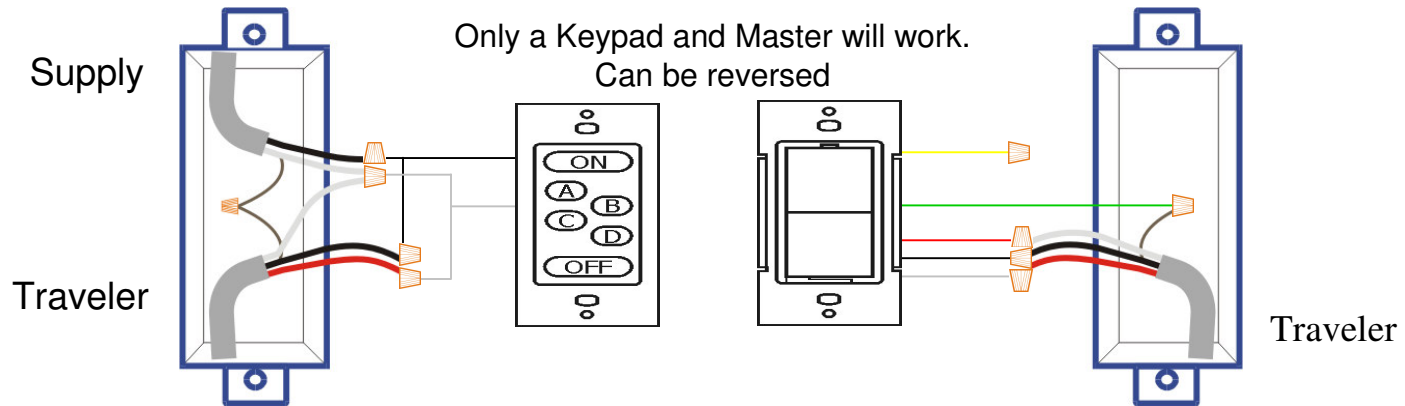
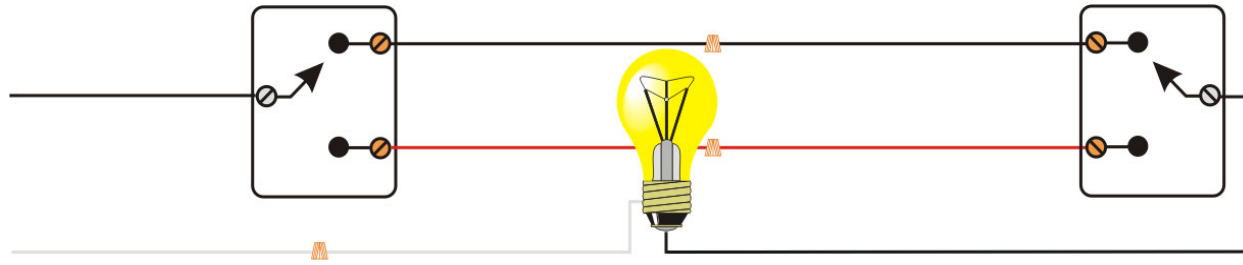


Note: Remote shown using Blue LED

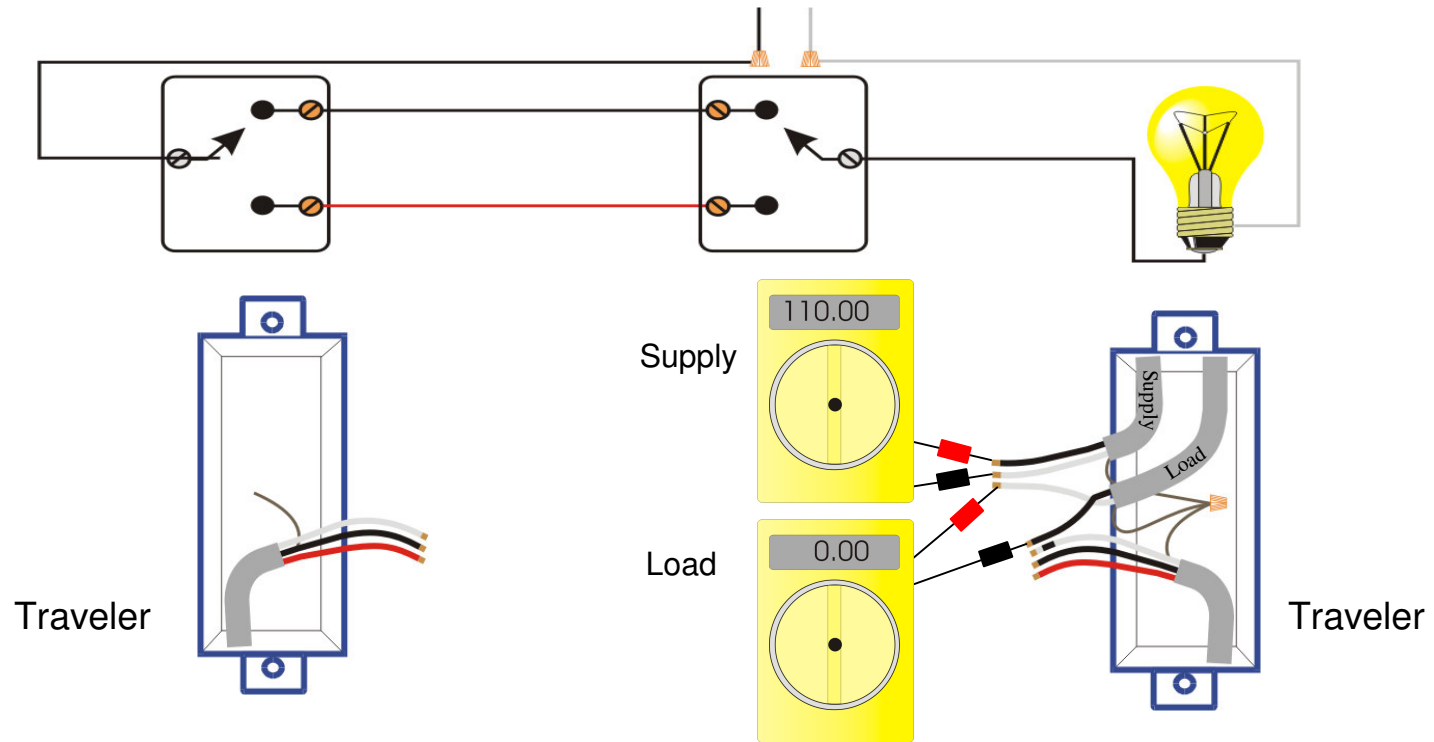
3 - Way Circuits – Method 2



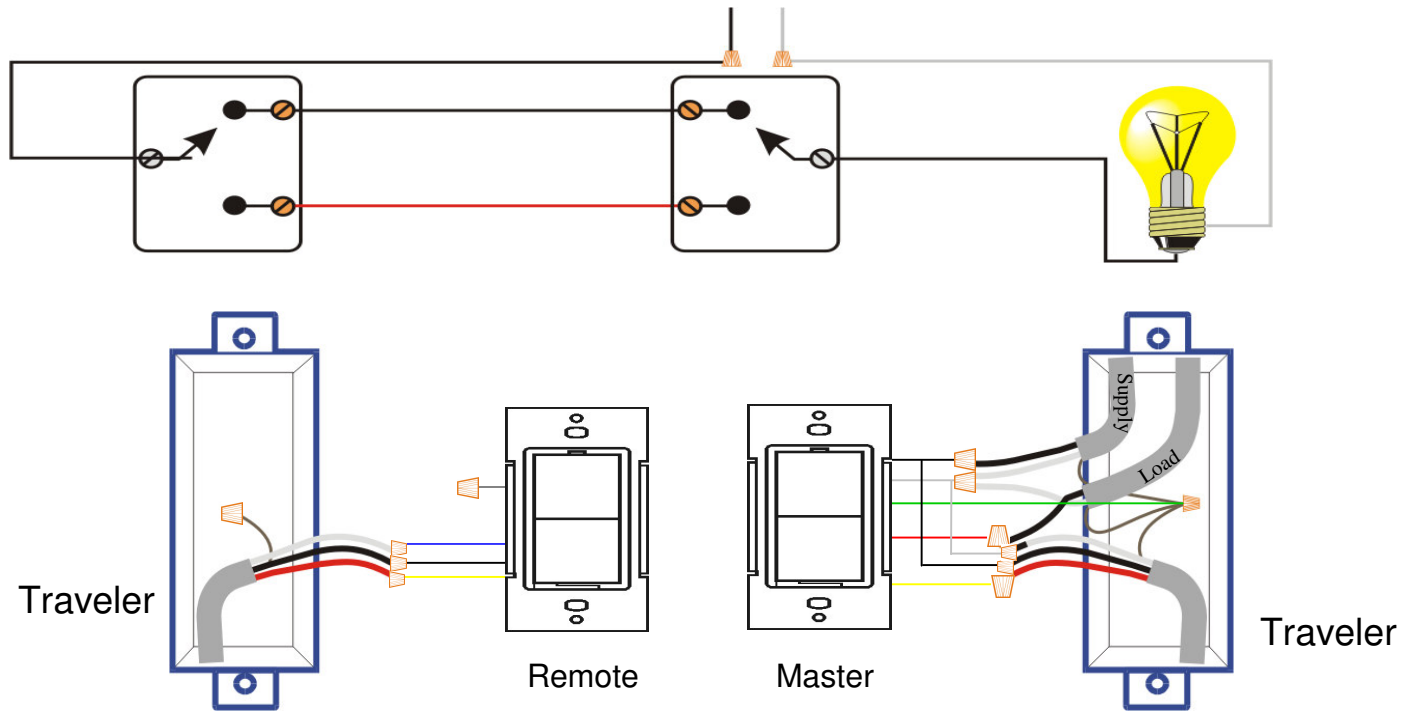
3 - Way Circuits – Method 2



3 - Way Circuits – Method 3

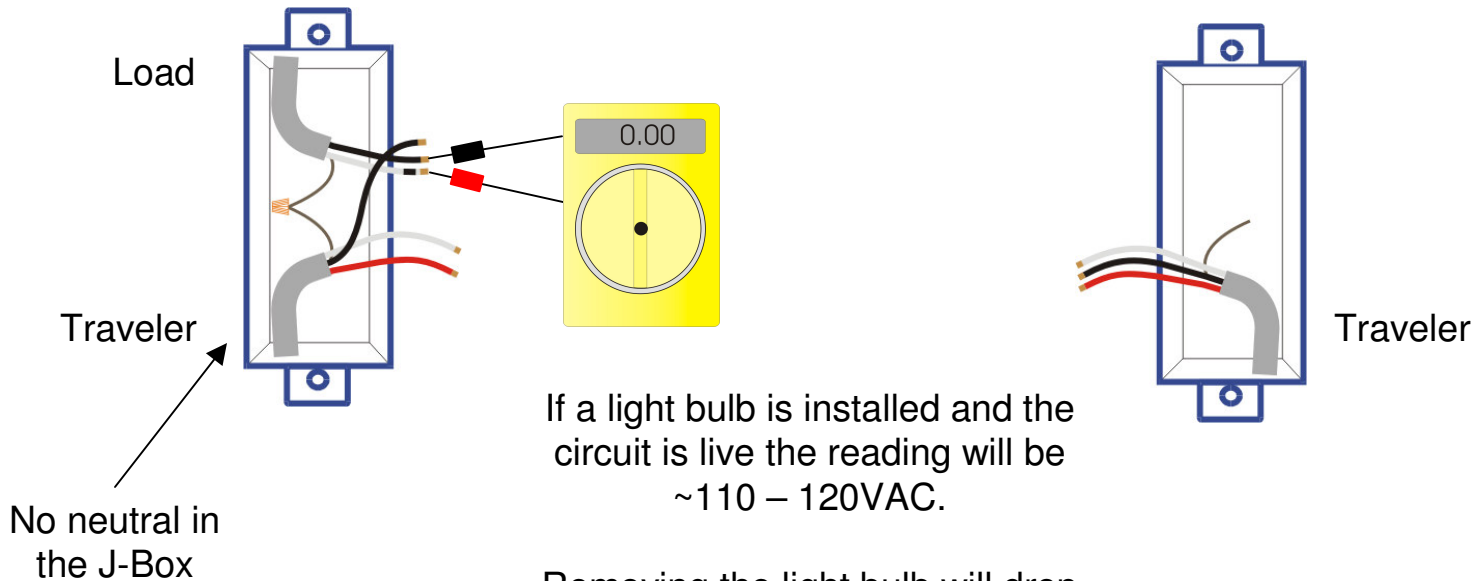
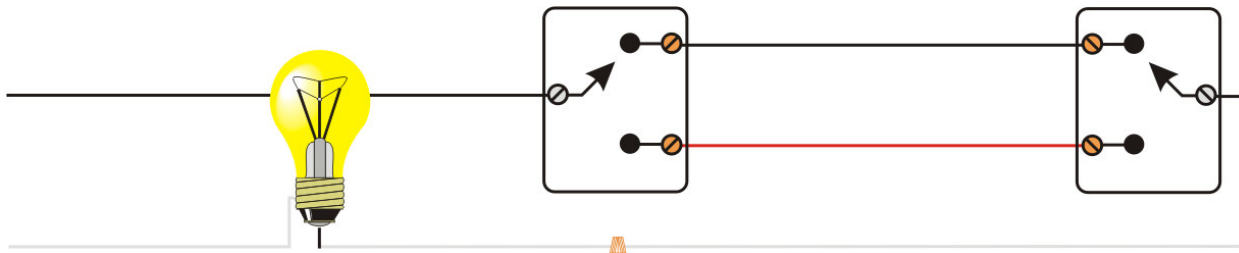


3 - Way Circuits – Method 3



Note: Remote shown using Blue LED

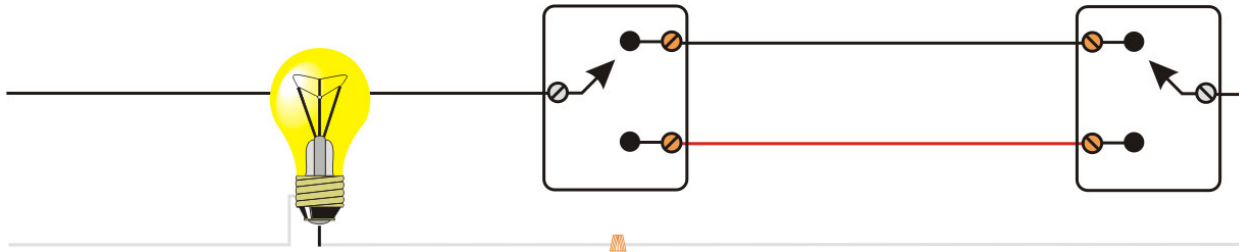
3 - Way Circuits – Method 4



If a light bulb is installed and the circuit is live the reading will be ~110 – 120VAC.

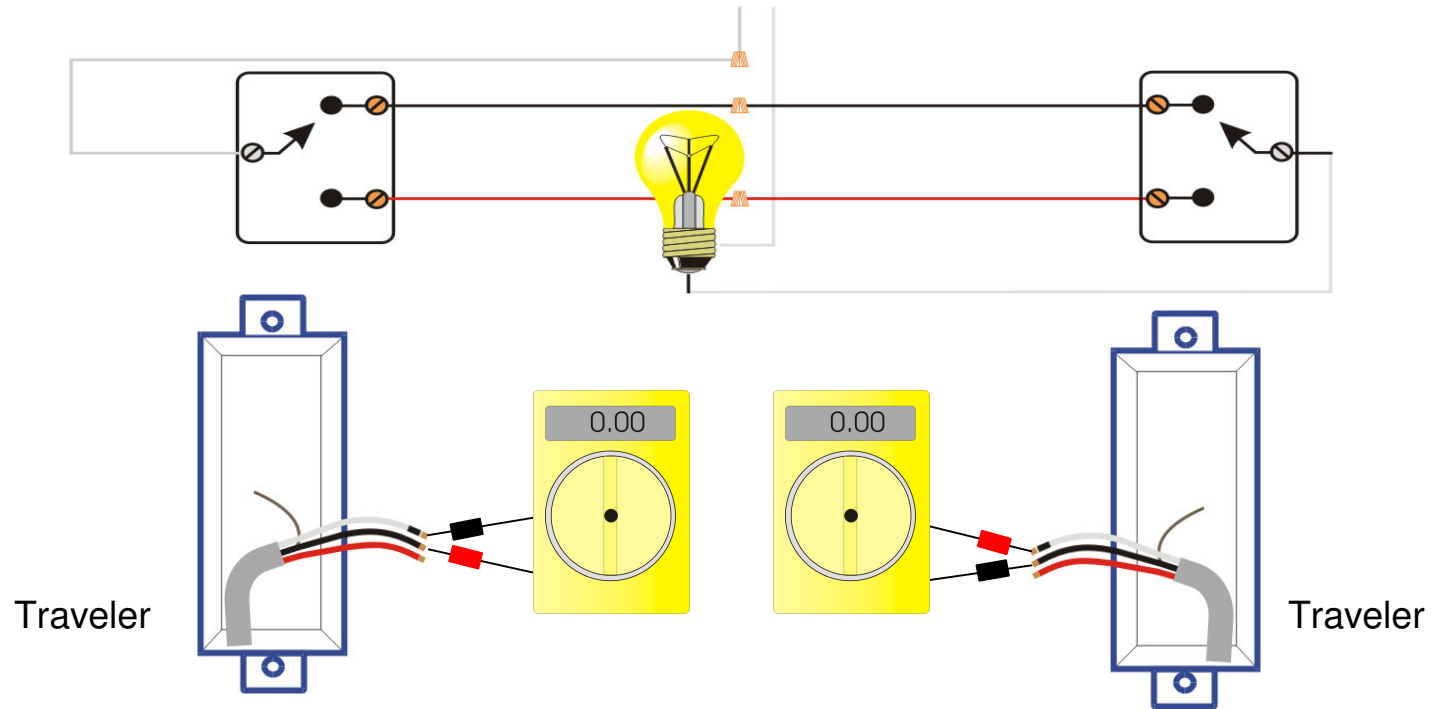
Removing the light bulb will drop the voltage to 0.

3 - Way Circuits – Method 4

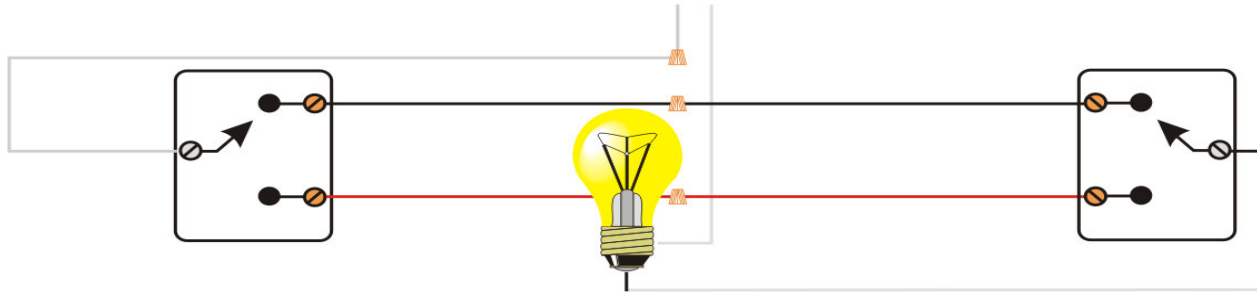


This circuit requires a neutral.
A neutral can be fished from a nearby electrical outlet providing it is not a GFCI circuit

3 - Way Circuits – Method 5



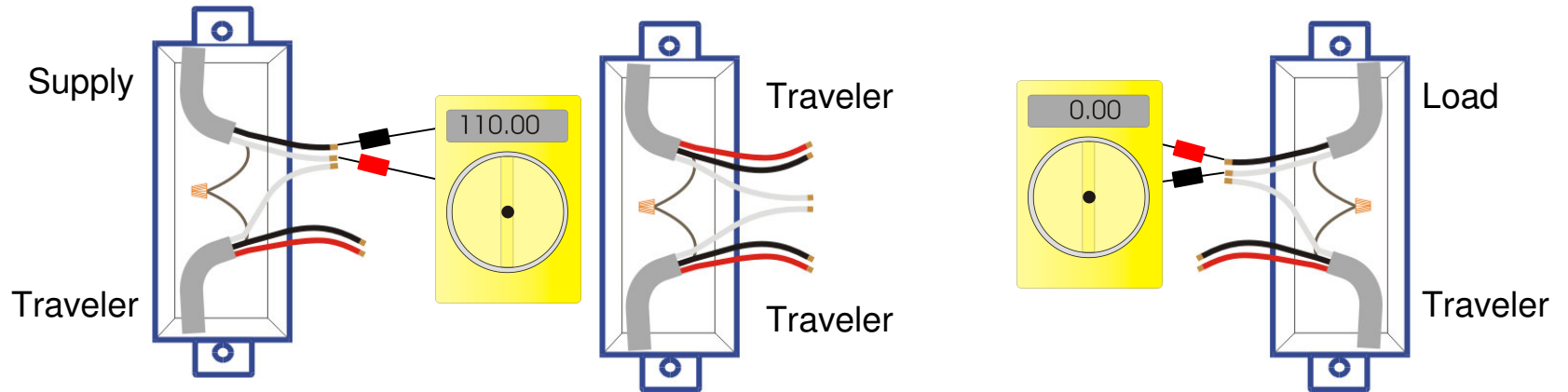
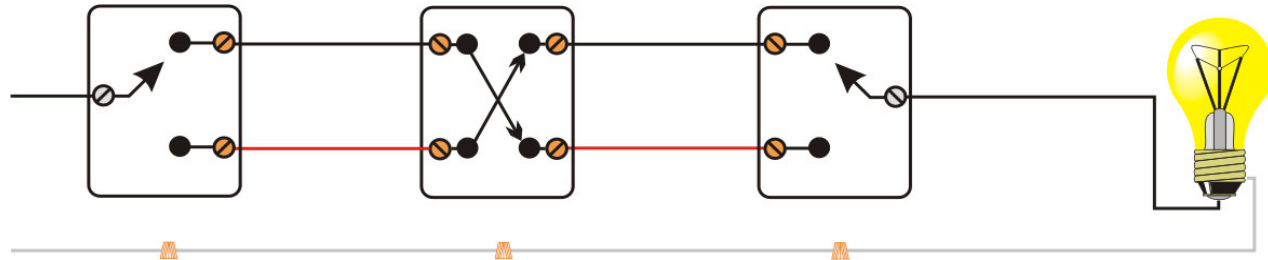
3 - Way Circuits – Method 5



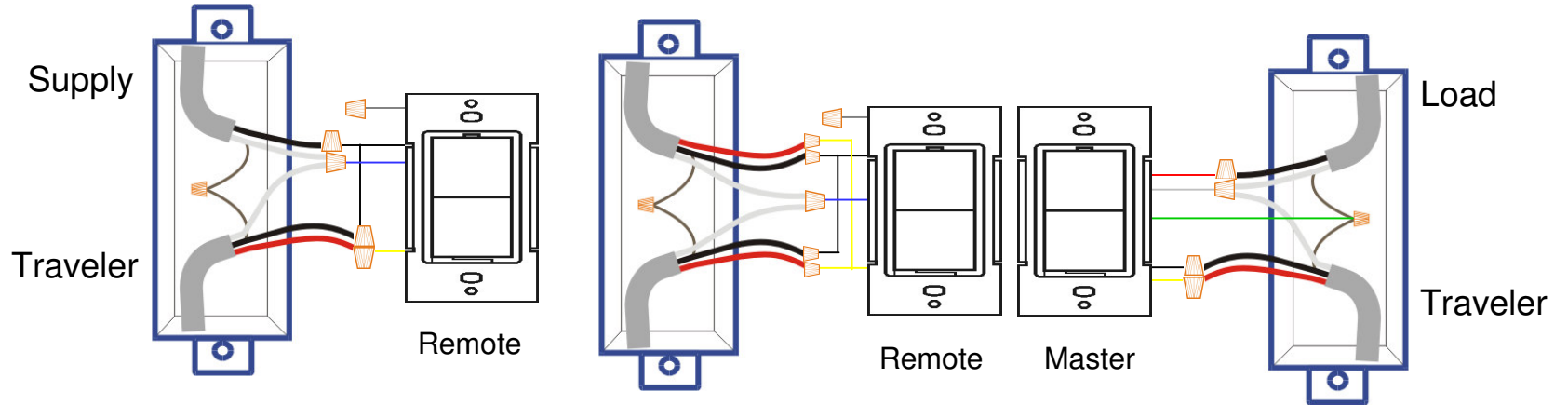
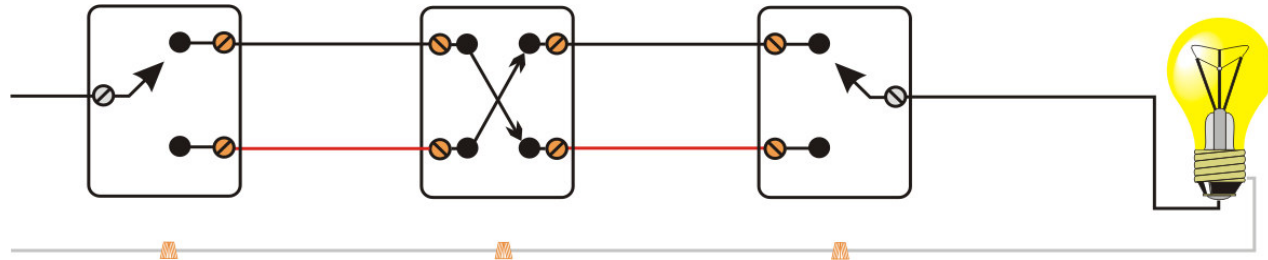
This circuit requires a neutral.

A neutral can be fished from a nearby electrical outlet providing it is not a GFCI circuit

4 - Way Circuits



4 - Way Circuits



Note: Remote shown using Blue LED