



UPB™ Wall Switch Dimmer User's Guide



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Chapter 1

About This Guide

This guide is intended for both the homeowner and the professional installer.

In this guide we will explain the operation and configuration of the PCS Wall Switch Dimmer (WS1D). Among other topics we will cover:

- What is a PCS Wall Switch Dimmer?
- Default operation of the Wall Switch Dimmer.
- How to customize the Rocker Switch Actions.
- How to use Wall Switch Dimmers with PCS Controllers.
- How to customize the Status LED color and behavior.
- How to configure Wall Switch Dimmers to control non-dimming loads.
- How to configure Wall Switch Dimmers to transmit messages that will provide LED feedback to Controllers.

We will use the UPB Setup program, UPStart, to configure some example UPB Lighting Systems

You may choose to install UPB devices and follow along with the examples in this guide or you may simply read this guide to get an understanding of the many things you can do with a UPB Wall Switch Dimmer.

The Assumptions

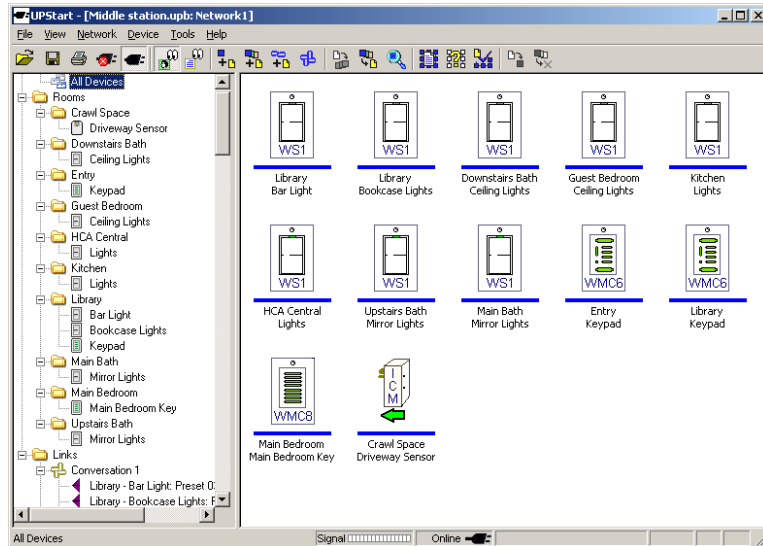
For the purposes of this guide, we assume that you are familiar with the basic operation of UPStart. If not, please familiarize yourself with it by referring to the [UPStart User's Guide](#).

We assume that a UPB network has already been created and the devices have been added to this network using the techniques taught in the [UPStart User's Guide](#).

Furthermore, for the purposes of the examples, we assume that the factory default configuration information that is set inside of new devices has been erased so that we are starting from “blank” (un-configured) devices.

About UPStart

UPStart is a Windows® based software application designed by Powerline Control Systems (PCS) that provides the ability to easily setup and test your UPB devices. Using UPStart, you will be able to unlock the hidden potential inside your UPB devices to design a custom lighting and control system that is tailored to your needs and desires.



Not only will you be able to configure your lighting and control system but, with UPStart's powerful test capabilities, you will also be able to test your powerline for noise, measure communication signal strengths, and functionally test your UPB devices. All this will give you good confidence that once you are finished installing and configuring your UPB lighting and control system you will never have to worry about coming back later to fix or "tweak" the system.

UPStart is designed to interface to the powerline through a special device called a Powerline Interface Module (PIM). The PIM plugs into any standard electrical wall outlet and connects to your PC or laptop computer via either a serial or USB cable.

The main purpose of UPStart is for configuring UPB devices. We can use UPStart to:

- Customize the many features built into our UPB devices to the exact way we prefer them to be set.
- Configure which pushbuttons control which devices.
- To build and configure dramatic lighting scenes that are activated by a single press of a pushbutton.

- To configure LED feedback.
- To configure the devices to interact with home automation software.

Chapter 2

About Your UPB Wall Switch Dimmer

What is a PCS UPB Wall Switch Dimmer?

The WS1D Wall Switch Dimmer is a high quality wall switch and light dimmer all wrapped up in one. It not only provides exceptional local control of its lighting load but it is the first wall switch to provide remote control operation via the Universal Powerline Bus (UPB™) two-way powerline communications technology.



Controllers spread throughout your house can remotely command your Wall Switch Dimmer to go to different light levels at different fade rates. Because it communicates on the powerline, no new wires are required to install this device. The Wall Switch Dimmer is also capable of storing up to 16 preset light levels and fade rates which allow it to be involved in single command triggered scenes.

The WS1D Wall Switch Dimmer has a decora-style rocker switch that is used to control its lighting load. The rocker switch can be used to turn the lights on and off as well as to brighten and dim the lights. Not only does the rocker switch control the lighting load, but it can also be configured to transmit UPB™ commands and reports that are useful in controlling other devices and providing feedback to display devices.

The WS1D has three separate ways that can be employed to control its light level:

- 1) Local Rocker Switch,
- 2) Remote Slave Switches, and
- 3) Universal Powerline Bus™ (UPB) Commands.

The WS1D also contains a single bi-color LED to indicate status, modes, and events.

Light Dimmer

The WS1D has Light Dimmer logic capable of producing 200 different levels of light output as well as off. The Light Dimmer can be configured (or commanded) to change light levels immediately (“Snap”) as well as gradually (“Fade”).

Rocker Switch

The WS1D has a decora-style Rocker Switch made up of two momentary pushbutton switches: one at the top and one at the bottom. The Rocker Switch can be used to set new light levels, set new operating modes, and to trigger transmissions of UPB messages.

LED Indicator

The WS1D has a bi-color LED indicator used to indicate its current status and mode of operation.

Slave Switch Input

The WS1D has a special input (wire) for connecting an optional Slave Switch (PCS part # RWS1), which can be used to control the WS1D in a similar fashion to the WS1D’s local Rocker Switch. A single line voltage traveler wire is all that is needed to hook a Slave Switch to a WS1D.

UPB Communication

Universal Powerline Bus™ (UPB) communication is a method of reliably communicating command, control, and status information across an electrical AC powerline. Because of its low cost and high reliability characteristics, the UPB communication method is ideally suited for command and control applications in both the residential and commercial markets.

UPB Receiver

The WS1D has UPB Receiver Logic capable of receiving UPB Communication Packets from the powerline.

UPB Transmitter

The WS1D has UPB Transmitter Logic capable of transmitting UPB Communication Packets onto the powerline.

WS1D Connections

The WS1D has four wires that are used to connect it to power, load, and an optional slave switch.

Figure 1 shows how the WS1D connects to the lighting system.

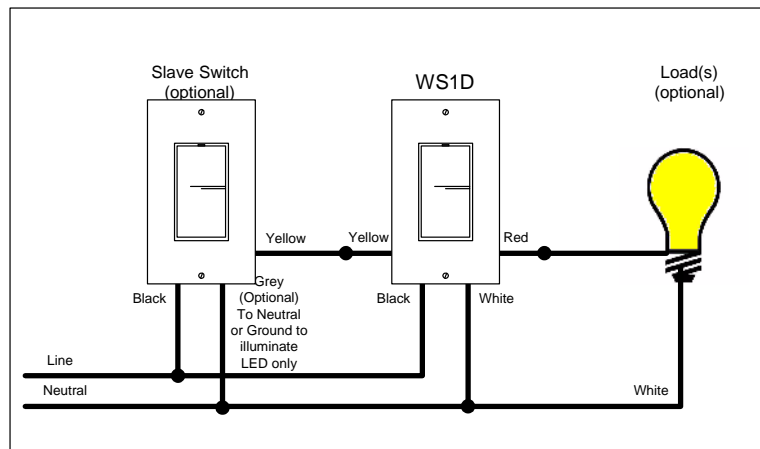


Figure 1: WS1D Connections To A Lighting System

Note: Please refer to the [Wall Switch Dimmer Installation Manual](#) for exact instructions on installing and wiring your WS1D Wall Switch Dimmer.

Chapter 3

Rocker Switch Actions

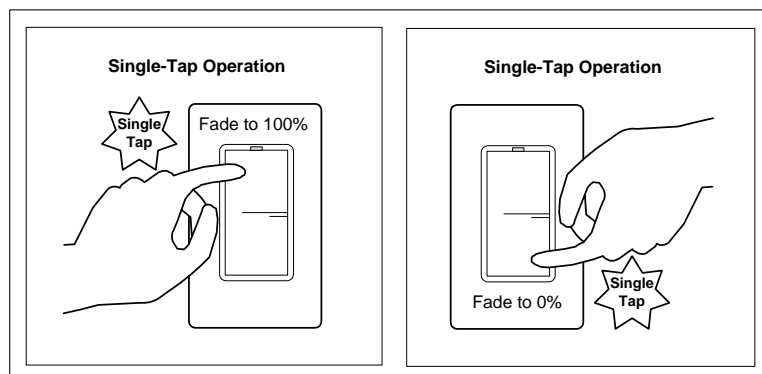
The rocker switch on the Wall Switch Dimmer is used to control its lighting load. It has a true rocker feel with a momentary switch at the top and one at the bottom. It is able to sense single-tap, double-tap, hold, and release events on either switch. This chapter will explain the factory default actions that get produced on the load when the rocker switch events occur. We also explain how to change this configuration to produce custom rocker switch actions.

Rocker Switch Default Actions

When shipped from the factory, the PCS Wall Switch Dimmers have the following default Rocker Switch Actions.

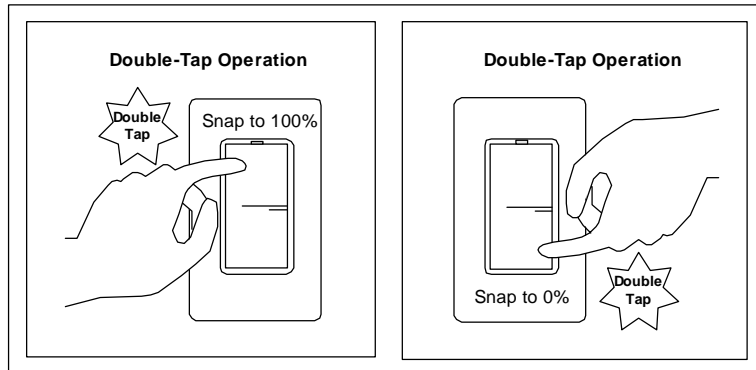
Single-Tap Operation

By default, the top rocker will fade the load to 100% when single-tapped and the bottom rocker will fade the load to 0% when single-tapped.



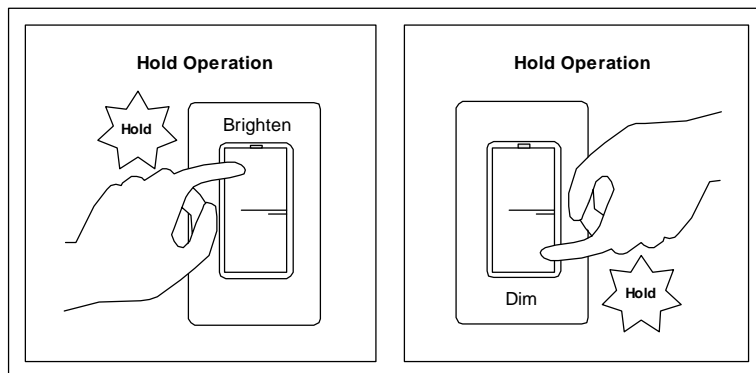
Double-Tap Operation

By default, the top rocker will snap the load to 100% when double-tapped and the bottom rocker will snap the load to 0% when double-tapped.



Press-And-Hold Operation

By default, the top rocker will brighten when pressed and held and the bottom rocker will dim when pressed and held. The fading operation uses the 3.3-second fade rate.

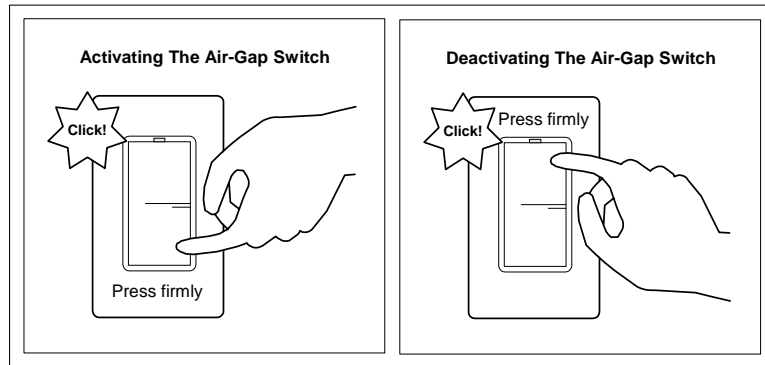


Remote Slave Rocker Switch Operation

The WS1D Wall Switch Dimmer can (optionally) be connected to one or more Remote Slave Switches (PCS model RWS1) producing three, four, or even five-way circuits. Each Remote Slave Switch has a decora-style rocker switch that can be used to control the lighting load of the WS1D in exactly the same way as the local rocker switch does as described above.

The Air-Gap Switch

The WS1D rocker switch also has an air-gap switch that will remove all power from the load for safe bulb replacement. To activate the air-gap switch firmly press the rocker bottom until you hear a loud “click” or you see the “System Off” label on the top rocker. To deactivate the air-gap switch firmly press the rocker bottom until you hear a loud “click”. The LED indicator should start to blink for a brief time and the lighting load should return to its last level.

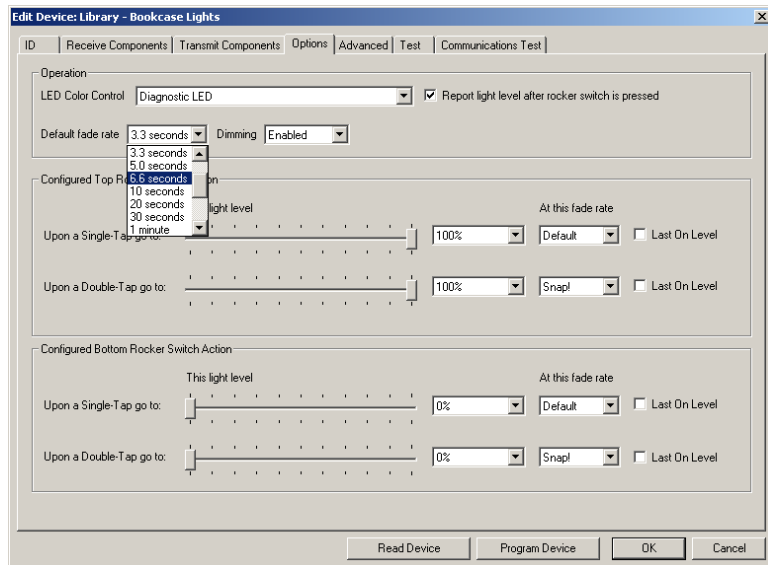


Changing Rocker Switch Actions With UPStart

The default Rocker Switch configuration is fine for most situations but what if you prefer something else? Suppose you prefer using the 1.6 second fade rate for your Dimmers’ fade operation, or suppose you want one Dimmer to only go to 75% upon a single-tap event and then go to 100% upon a double-tap event? All these, and more, are Rocker Switch Actions that can be easily configured using UPStart.

Changing The Default Fade Rate

Both the brightening and dimming operation use something called the Default Fade Rate to determine how fast to ramp from 0% to 100%. For instance, if the Default Fade Rate is set to 3.3 seconds (the factory default), and you press and hold the top rocker switch, the dimmer will brighten the load from 0% to 100% in about 3.3 seconds. Some people may think this fade rate is too slow or too fast for their personal taste. For our example, we would like the Library Bookcase Lights to fade a little slower at the 6.6-second fade rate. To do this we use the Edit Device Dialog. This dialog has a Options tab that is used for configuring options such as the Default Fade Rate.

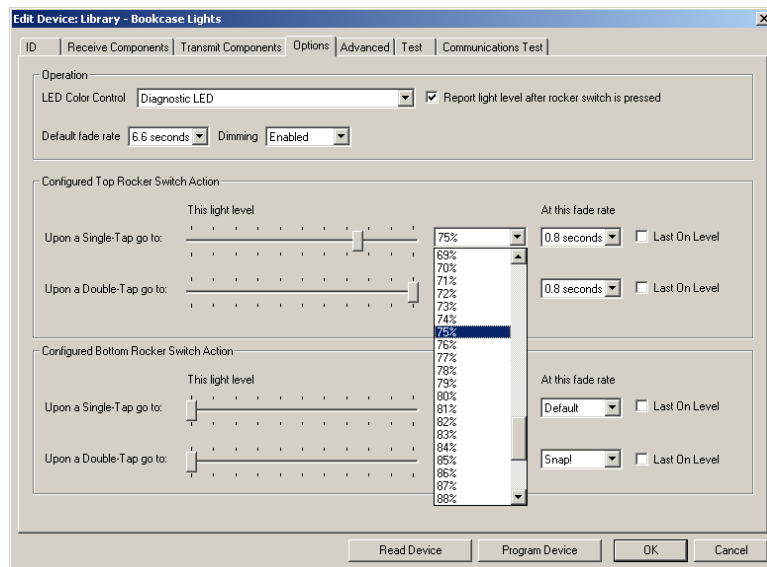


We go to the Options tab and set the selector for Default Fade Rate to “6.6 seconds”. To program this configuration into the device we press the “Program Device” button. UPStart performs the necessary command steps to program the configuration data into our device. When the command steps are complete we can press the OK button to close the dialog.

Changing The Rocker's Single-Tap/Double-Tap Actions

By default, the top rocker will fade the load to 100% when single-tapped, snap the load to 100% when double-tapped, brighten when held, and stop brightening when released.

In our example, we want the Library Bookcase Lights to react in a special way to the single-tap and double-tap events on its top rocker. We would prefer if the load would fade to 75% upon a single-tap and that it would fade up to 100% upon a double-tap. We also want the fade rate for both of these events to be 0.8 seconds. To configure this we again go to the Edit Device Dialog. This dialog has an Options tab that is used for configuring options such as the Rocker Switch Actions.



We go to the Options tab and set the selectors for the Top Rocker Single-Tap Action to “75%” at “0.8 seconds”. We also set the selectors for the Double-Tap Action to “100%” at “0.8 seconds”.

To program this configuration into the device we press the “Program Device” button. UPStart performs the necessary command steps to program the configuration data into our device. When the command steps are complete we can press the OK button to close the dialog.

What Does The Last On Level Mean?

Notice on the Options tab a selection for Last On Level. What does that mean? The Last On Level is the light level that the dimmer was last set to prior to being commanded to 0% (off). For example, if we press and hold the bottom rocker switch to dim the load to 50% and release the rocker then 50% is the new Last On Level. Now if we single-tap the bottom rocker switch to fade the load to 0% the Last On Level stays at 50%. The Rocker Switch Actions can be configured to use the Last On Level as the level to set the load to upon a single-tap or double-tap event. In our example above, single tapping a rocker switch set for Last On Level would cause it to set the load to 50%. This mechanism is an easy way of letting homeowners set and adjust a light level that they desire to have activated by a rocker switch event.

Chapter 4

Status LED Behavior

The Wall Switch Dimmer has a multi-colored Status LED that can be configured to operate in one of sixteen different modes. The Status LED can be set to any of four different colors: red, green, orange, and black and it can be set to a different color based on the state of the load or the status of the powerline. This chapter will explain the default Status LED behavior as well as steps necessary to change the mode of operation for the Wall Switch Dimmer's Status LED.

Default Status LED Operation (Diagnostic LED Mode)

By default, the Status LED on the Wall Switch Dimmer operates in the Diagnostic LED mode. In this mode of operation the LED will quickly change color based on what is currently happening on the powerline. The LED will normally be orange indicating that the powerline is quiet. When a powerline message is received that is addressed to your Wall Switch Dimmer the Status LED will quickly blink green. When a powerline message is received that is not addressed to your Wall Switch Dimmer the Status LED will quickly blink black (off). When your Wall Switch Dimmer transmits a message on the powerline the Status LED quickly blinks red. This is summarized in Table 1 below.

Event	LED Action
Powerline is quiet	Solid Orange
Powerline message is received and accepted	Quick pulse of Green
Powerline message is received and rejected	Quick pulse of Black (off)
Powerline message is transmitted	Quick pulse of Red

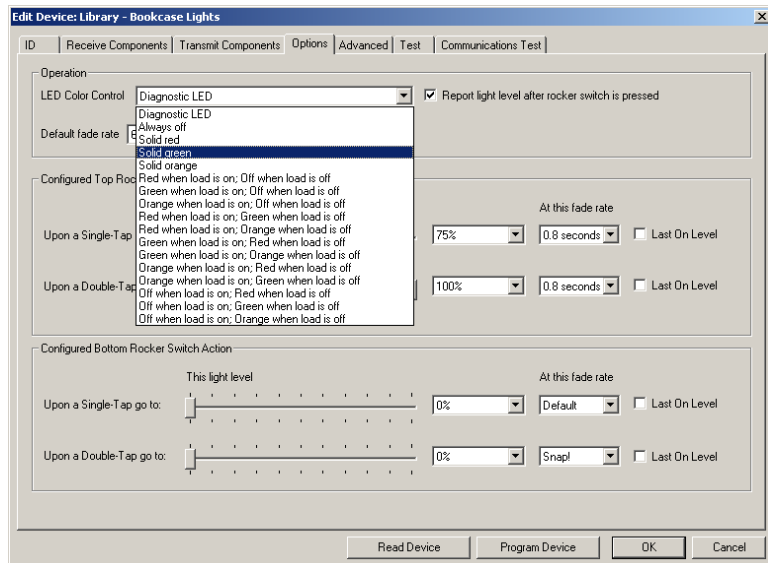
Table 1: The Diagnostic LED Mode

Changing The Status LED Operation With UPStart

The default Status LED operation is fine for most situations but what if you prefer something else? Suppose you don't like the LED blinking and prefer to just use the LED as a simple colored night-light to help you find the Wall Switch Dimmer in the dark. Suppose you want the Status LED to indicate if the load is on or off, lit to one color when the load is on and lit to another color when the load is off. All these, and more, are Status LED Modes that can be easily configured using UPStart.

Changing The Status LED To A Night-Light Mode

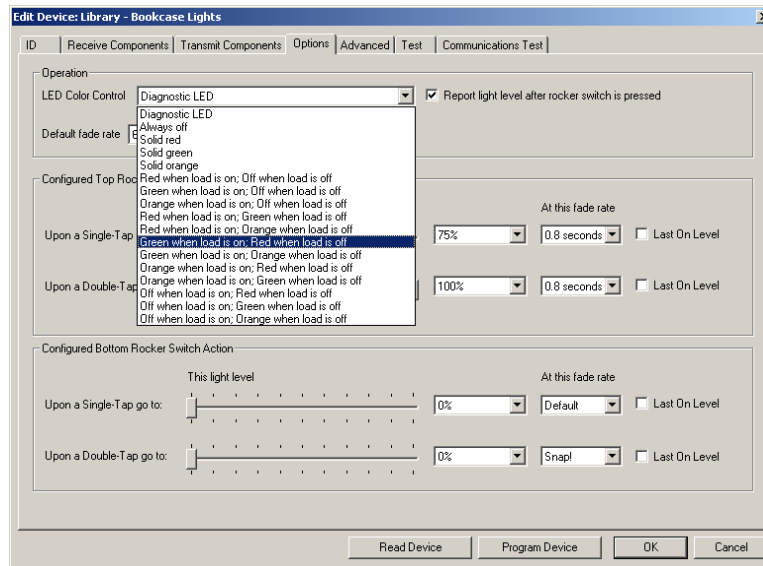
For our example, we would like the Status LED on our Wall Switch Dimmer to simply act as a night-light and stay one solid color. We can choose between any of the four colors (red, green, orange, or black) to set the LED to. We have decided to use the color green for our example. To configure the Status LED mode of operation we again use the Edit Device Dialog of our Wall Switch Dimmer. This dialog has an Options tab that is used for configuring options such as the Status LED Mode.



We go to the Options tab and set the selectors for the LED Color Control to “Solid green”. To program this configuration into the device we press the “Program Device” button. UPStart performs the necessary command steps to program the configuration data into our device. When the command steps are complete we can press the OK button to close the dialog.

Changing The Status LED To A Load Indicator

For our example, the Wall Switch Dimmer for our Outside Lights is mounted inside our house while its lighting load is mounted outside. For those situations where the load can't always be seen at the Wall Switch Dimmer it is nice to have the Status LED indicate the state of the load. We want the Status LED for our Outside Lights Wall Switch Dimmer to turn green when its load is on and turn red when the load is off. To do this, we once again use the Options tab of the Edit Device Dialog. In this case we choose the mode of “Green when load is on. Red when load is off”.



To program this configuration into the device we press the “Program Device” button. UPStart performs the necessary command steps to program the configuration data into our device. When the command steps are complete we can press the OK button to close the dialog.

Chapter 5

Using Wall Switch Dimmers with PCS Controllers

Any device capable of transmitting UPB commands on the powerline can remotely control PCS UPB Wall Switch Dimmers. This chapter will describe two such devices - the PCS 6- and 8-Button Controllers. We will describe their default control of the Wall Switch Dimmers as well as how the default control can be modified to link different pushbuttons to different Wall Switch Dimmers as well as to create interesting lighting scenes.

Using Wall Switch Dimmers With PCS 6-Button Controllers

PCS 6-Button Controllers can be used to control one or more WS1D Wall Switch Dimmers.



Each 6-Button Controller has six pushbuttons labeled ON, OFF, A, B, C, and D, as well as a bright (▲) and dim (▼) button.

Table 2 describes the factory default control that each pushbutton has on the WS1D Wall Switch Dimmer. This factory default configuration can be changed either by using a UPB Setup Tool or by following the steps outlined in the “Changing The Preset Light Levels” section.

Button	Level	WS1D Operation
ON	100%	Single-Tap or Hold will command the WS1D to fade to 100% (on) at the 3.3-second fade rate. Double-Tap will command the WS1D to snap to 100% (on).
A	80%	Single-Tap, Double-Tap, or Hold will command the WS1D to fade to 80% at the 3.3-second fade rate.
B	60%	Single-Tap, Double-Tap, or Hold will command the WS1D to fade to 60% at the 3.3-second fade rate.

Button	Level	WS1D Operation
C	40%	Single-Tap, Double-Tap, or Hold will command the WS1D to fade to 40% at the 3.3-second fade rate.
D	20%	Single-Tap, Double-Tap, or Hold will command the WS1D to fade to 20% at the 3.3-second fade rate.
OFF	0%	Single-Tap or Hold will command the WS1D to fade to 0% (off) at the 3.3-second fade rate. Double-Tap will command the WS1D to snap to 0% (off).
▲	-	Holding will command the WS1D to fade to 100% at the 10-second fade rate. Release will command the WS1D to stop fading.
▼	-	Holding will command the WS1D to fade to 100% at the 10-second fade rate. Release will command the WS1D to stop fading.

Table 2: Default PCS 6-Button Control of the WS1D Wall Switch

Using Wall Switch Dimmers With PCS 8-Button Controllers

A PCS 8-Button Controller can be used to control one or more WS1D Wall Switch Dimmers.



Each 8-Button Controller has eight pushbuttons labeled E through L. By default, the PCS 8-Button Controller is not configured to control the WS1D Wall Switch Dimmers. This factory default configuration can be changed either by using a UPB Setup Tool or by following the steps outlined in the “Changing The Preset Light Levels” section.

Using UPStart to Change Pushbutton Behaviors

This section will describe how the PCS Controllers can be modified (using UPStart) to link different Controller pushbuttons to different Wall Switch Dimmers as well as to create interesting lighting scenes. Before we can do this, however, we must go over some basics of how the pushbuttons are configured.

Note: this section assumes the reader has a basic understanding of UPStart as described in the UPStart User's Guide.

What Can Pushbuttons Transmit?

Each pushbutton on a PCS Controller can be configured to transmit a different UPB command for each of the four pushbutton events: single-tap, double-tap, hold, and release. Furthermore, each pushbutton can be configured to toggle between two different commands each time that event occurs. The possible UPB commands that can be assigned are summarized in Table 3 below.

Command	Description
Activate	Commands all devices to go to their preset level at their preset fade rate.
Deactivate	Commands all devices to go to 0% at their preset fade rate.
Goto On	Commands all devices to go to 100% at their default fade rate.
Goto Off	Commands all devices to go to 0% at their default fade rate.
Fade Up	Commands all dimmable devices to go to 100% at the 6.6-second fade rate.
Fade Down	Commands all dimmable devices to go to 0% at the 6.6-second fade rate.
Fade Stop	Commands all dimmable devices to stop fading.
Snap On	Commands all devices to go to 100% at the snap (instant) fade rate.
Snap Off	Commands all devices to go to 0% at the snap (instant) fade rate.
Quick On	Commands all devices to go to 100% at the 0.8-second fade rate.
Quick Off	Commands all devices to go to 0% at the 0.8-second fade rate.
Slow On	Commands all devices to go to 100% at the 10-second fade rate.

Command	Description
Slow Off	Commands all devices to go to 0% at the 10-second fade rate.
Blink	Commands all devices to blink their outputs on and off at a 0.5-second blink rate.

Table 3: UPStart’s UPB Commands

What Are Transmit Modes?

In order to make it easier for you to configure your pushbuttons’ transmit behaviors UPStart has defined a certain set of popular configurations and called them Transmit Modes. The current set of UPStart Transmit Modes are summarized as follows:

Scene Activator Mode:

In the Scene Activator mode the pushbutton will transmit an “Activate” command whenever it is tapped or held. This is ideal for when you want a single pushbutton to activate a preset scene.

Off Button Mode:

In the Off Button mode the pushbutton will transmit an “Activate” command whenever it is single-tapped or held. **Note:** it is up to the installer to configure the devices activated by this pushbutton to go to 0%. It will also transmit a “Snap Off” command whenever it is double-tapped. This is usually assigned to the OFF Button on 6-Button Controllers to either fade or snap the lights to 0% (off).

On Button Mode:

In the On Button mode the pushbutton will transmit an “Activate” command whenever it is single-tapped or held. **Note:** it is up to the installer to configure the devices activated by this pushbutton to go to a desired level. It will also transmit a “Snap On” command whenever it is double-tapped. This is usually assigned to the ON Button on 6-Button Controllers to either fade or snap the lights to 100% (on).

Dim Button Mode:

In the Dim Button mode the pushbutton will transmit a “Fade Down” command whenever it is held and a “Fade Stop” command when it is released. This is usually assigned to the DN Button on 6-Button Controllers to dim the lights.

Bright Button Mode:

In the Bright Button mode the pushbutton will transmit a “Fade Up” command whenever it is held and a “Fade Stop” command when it is released. This is usually assigned to the UP Button on 6-Button Controllers to brighten the lights.

Top Rocker Mode:

In the Top Rocker mode the pushbutton will transmit a “Goto On” command whenever it is single-tapped and a “Snap On” command whenever it is double-tapped. It will also transmit a “Fade Up” command whenever it is held and a “Fade Stop” command when it is released. This is usually used to emulate the top rocker switch of a Wall Switch Dimmer.

Bottom Rocker Mode:

In the Bottom Rocker mode the pushbutton will transmit a “Goto Off” command whenever it is single-tapped and a “Snap Off” command whenever it is double-tapped. It will also transmit a “Fade Down” command whenever it is held and a “Fade Stop” command when it is released. This is usually used to emulate the bottom rocker switch of a Wall Switch Dimmer.

Panic Button Mode:

In the Panic Button mode the pushbutton will transmit a “Blink” command whenever it is single-tapped or held. It will also transmit a “Goto Off” command whenever it is double-tapped. This is usually used to activate an alarm type response in which a group of lights start blinking. Double-tapping the pushbutton stops the blinking.

Toggle Button Mode:

In the Toggle Button mode the pushbutton will alternate between transmitting an “Activate” command and a “Deactivate” command whenever it is pressed. This is usually used when you want a single pushbutton to control a single device with on/off control.

On/Off Button Mode:

In the On/Off Button mode the pushbutton will alternate between transmitting a “Goto On” command and a “Goto Off” command whenever it is single-tapped or held. It will also alternate between transmitting a “Snap On” command and a “Snap Off” command whenever it is single-tapped. This is also used when you want a single pushbutton to control a single device with on/off control.

Super Toggler Mode:

In the Super Toggler mode the pushbutton will alternate between transmitting an “Activate” command and a “Deactivate” command whenever it is single-tapped. It will also alternate between transmitting a “Snap On” command and a “Snap Off” command whenever it is double-tapped. It will alternate between transmitting a “Fade Up” command and a “Fade Down” command whenever it is held and it will transmit a “Fade Stop” command when it is released. This is usually assigned to the pushbuttons on an 8-Button Controller when you want a single pushbutton to control a single device with on/off and dimming control.

Null Button Mode:

In the Null Button mode the pushbutton will not transmit any command onto the powerline.

Custom Button Mode:

In the Custom Button mode the tool allows you to assign any two commands to each pushbutton event. This mode is used to create any type of transmit control that wasn’t provided in the previous set of UPStart Transmit Modes.

What Are Links?

In the PCS UPB Lighting System, all control operations are done using Links. There are 254 available Links per UPB network. Links are used to logically “connect” events on one or more devices to actions on one or more other devices. When two or more different devices share a common Link they are said to be “linked” together. They can now communicate with each other over the powerline using the Link as a common identifier in all of their communications. UPStart makes it easy to “link” devices together. It also allows you to name your Links (i.e. “All Lights On”) so that you can more easily work with them.

Figure 2 shows an example of how the Link associated with the ‘G’ pushbutton will control Wall Switch ‘A’ (which contains the same Link) but won’t affect Wall Switch ‘B’ (which doesn’t contain the same Link).

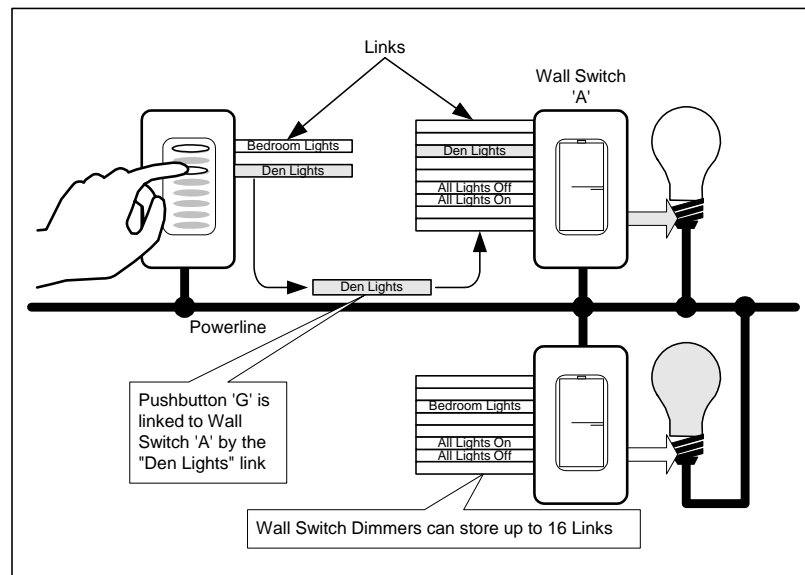


Figure 2: Links Allow One Device To Control Another Device

The power of Links is that you can “link” more than two devices together. For instance, one Controller pushbutton can be linked to four Wall Switch Dimmers allowing the single press of that pushbutton to trigger all four lights to go to preset or absolute levels. The LED indicators on the Controller’s pushbuttons can also be assigned the same Link allowing the LED indicators on two (or more) Controllers to track each other.

Later in this chapter we will show you ways to assign a Link to another Wall Switch Dimmer so that the same pushbutton controls multiple Wall Switch Dimmers.

What Are Scenes?

Scenes are simply a set of pre-configured light levels and fade rates in one or more devices that get “activated” and “deactivated” by a single command (i.e. push of a button).

In the PCS UPB Lighting System, all control operations are done using Links. There are 254 available Links per UPB network. Links are used to logically “connect” events on one or more devices to actions on one or more other devices. When two or more different devices share a common Link they are said to be “linked” together. They can now communicate with each other over the powerline using the Link as a common identifier in all of their communications.

In addition, many of the PCS UPB Lighting System scene-capable devices, such as Wall Switch Dimmers, allow for a preset light level and fade rate to be associated with each Link (see Figure 3).

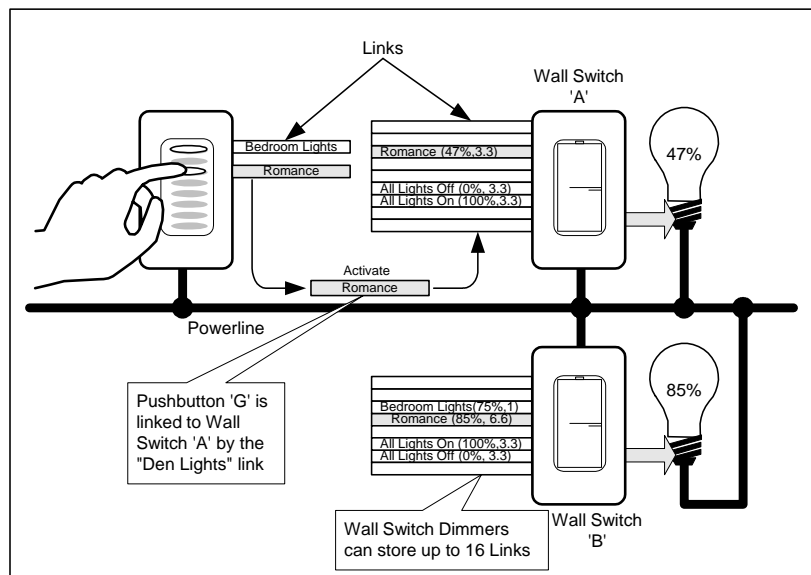


Figure 3: Links Have A Light Level & Fade Rate (Scene) Associated With Them

A special UPB command (called “Activate”) is used to command all of the devices that have the same Link to go to their preset Light Levels at their preset Fade Rates. For instance, in our example in Figure 3, pressing the ‘G’ pushbutton sends an “Activate” command on the “Romance” Link causing Wall Switch ‘A’ to go to 47% at the 3.3 second fade rate and Wall Switch ‘B’ to go to 85% at the 6.6 second fade rate.

Manually Adjusting The Preset Light Levels (Scenes)

Each WS1D Wall Switch Dimmer can hold up to sixteen different preset light levels (0% - 100%) that can be “linked” to a pushbutton on a UPB Lighting System Controller. Table 2 described the factory default light levels that get activated by each pushbutton press that is “linked” to a Wall Switch Dimmer.

The factory default light levels are nice but they can easily be overridden by following the steps outlined in Figure 4 below.

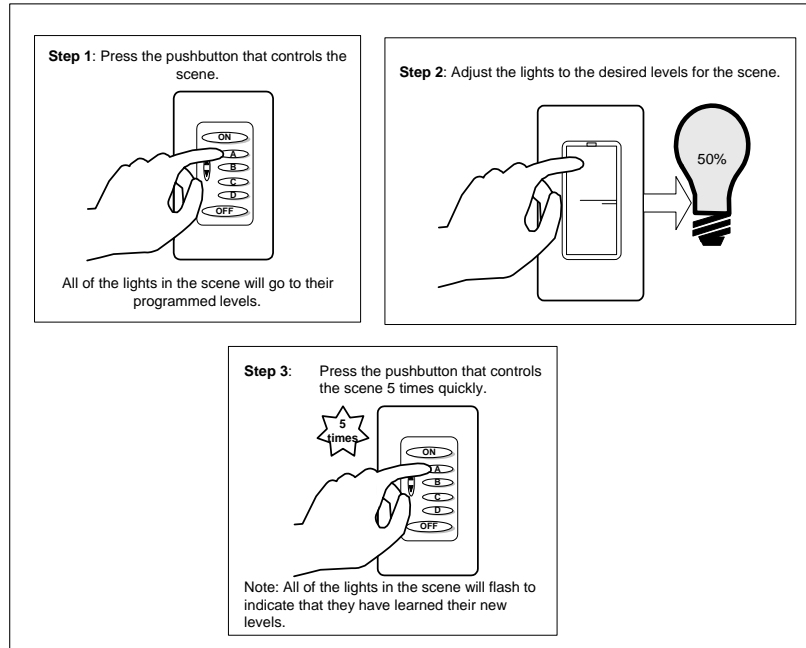


Figure 4: Manually Changing The Preset Light Levels

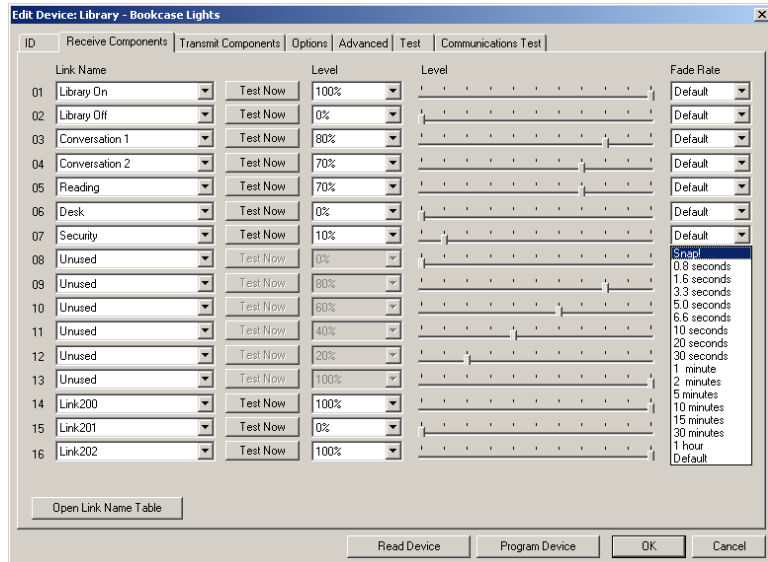
Using this adjustment procedure, the homeowner can easily adjust and “tweak” the light levels to his/her personal tastes. This procedure can be repeated as many times as you like until you have the levels set just right.

Note: this procedure only works on Controller pushbuttons and Wall Switch Dimmers that are already “linked” together. More information about “linking” Controller pushbuttons to Wall Switch Dimmers is contained in the next sections of this chapter.

Adjusting The Preset Light Levels With UPStart

UPStart can also be used to adjust the preset Light Levels and Fade Rates that are stored inside of the Wall Switch Dimmer. This section describes how to do that.

Each dimmer preset has a corresponding Light Level and Fade Rate that can be adjusted. To do this we again use the Receive Components tab on the Edit Device Dialog of our Wall Switch Dimmers.



We use the controls on the Receive Components tab to set each used scene's Light Level and Fade Rate to the desired values. To program this configuration into the device we press the "Program Device" button. UPStart performs the necessary command steps to program the configuration data into our device. When the command steps are complete we can press the OK button to close the dialog.

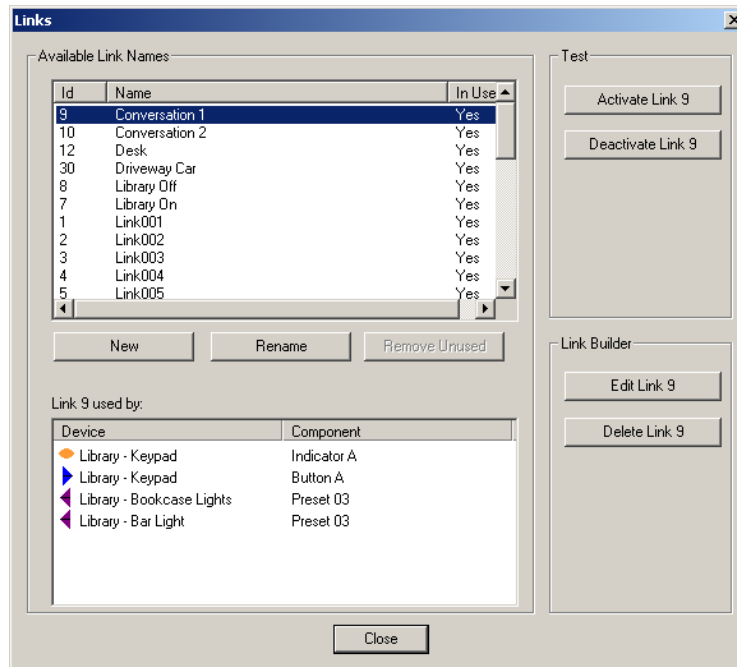
Linking Pushbuttons To Dimmers With UPStart

One of the main things you will want to do with UPStart is to use it to link events on the pushbuttons of your Controllers (like single-taps and double-taps) to corresponding actions on your Dimmers (like turning them on or off). This is the way you get a single-tap of the top pushbutton (E) on your 8-Button Controller to turn on your downstairs lights and the next pushbutton (F) to turn off your bedroom lights.

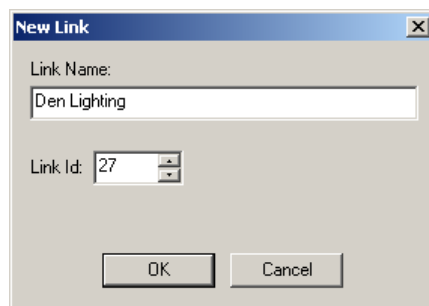
In this section we will go through the steps to necessary to link a Controller’s pushbutton to a Wall Switch Dimmer preset.

Step 1: Create The Links

Before you can assign Links to your devices you must first create and name the Links. This is done using the Link Names Dialog that is activated by the **Network→Link Names** menu item.



We create a new Link by pressing the “New” button, which brings up a New Link Dialog.



We use the New Link Dialog to enter a name for our new Link.

Note: Link Names can be any length of alphanumeric and punctuation characters. It is suggested that you use words that will help you identify what the purpose of the Link is. For instance, if the Link is used to control a single device then use the name of that device. If the Link is used to control a scene then use a scene name (e.g. Good Morning, All Lights Off, etc.).

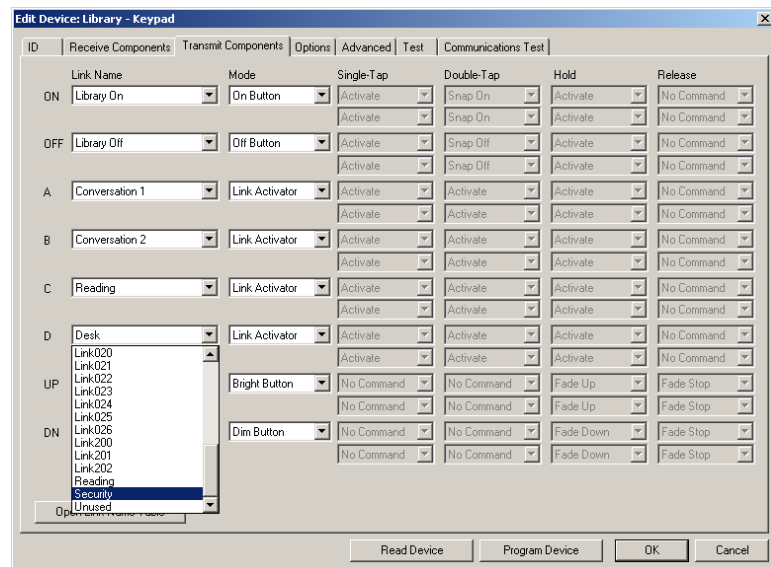
Press the OK button to accept the Link Name and repeat this process for any other Links you want to add.

After creating and naming all of the Links that we want we close the Link Names Dialog by pressing the “Close” button.

Step 2: Assign The Links To The Pushbuttons

Now that we have created the Links we can assign them to the individual pushbuttons. To do this, we bring-up the Edit Device Dialog for our Controller. In UPB terminology, the pushbuttons on the 6-Button Controller are considered to be Transmit Components (because they transmit UPB messages on the powerline). There is a special tab on the Edit Device Dialog called the Transmit Components tab that is used to configure how the pushbuttons behave.

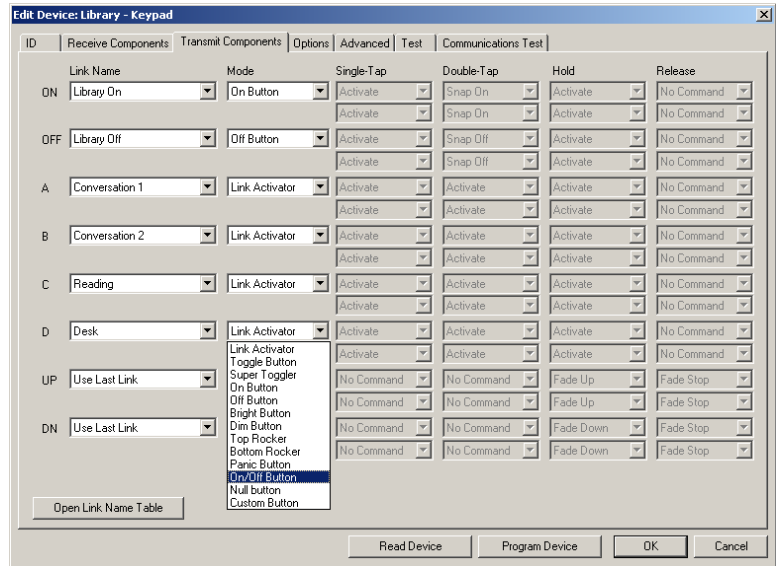
Each row of this tab corresponds to a different pushbutton on the Controller. Each pushbutton has a Link Name selector that is used to assign a Link to a pushbutton. We use the Transmit Components tab to assign each pushbutton to a corresponding Link.



After the Links are assigned to the pushbuttons it is time to configure how the pushbuttons will transmit to the Wall Switches. To do this we go back to the Transmit Components tab for the Controller. Each pushbutton on this tab has a Mode selector that is used to assign it a transmit mode. This chapter will not go into the details of each transmit mode but, for the purposes of this example, we have selected the “On/Off Button” mode for each of our pushbuttons.

About the Null Button Mode:

By default, the pushbuttons are set to the Null Button mode. In this mode the pushbutton will not transmit any command on the powerline.



About the On/Off Button Mode:

The On/Off Button Mode is designed to transmit a “Goto On” command when the pushbutton is single-tapped or held and transmit a “Goto Off” command the next time it is single-tapped or held. Furthermore, it will toggle between transmitting a “Snap On” command and a “Snap Off” command each time it is double-tapped.

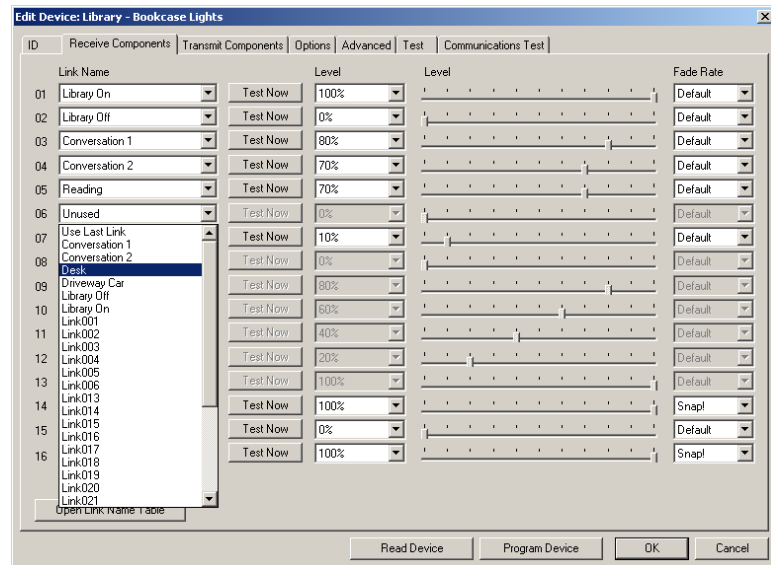
After all of the pushbuttons are assigned to the “On/Off Button” mode we press the OK button to accept the edits.

Step 3: Assign The Links To The Wall Switch Dimmers

To complete the linking process we will now assign the Links to the Wall Switch Dimmers as well. Once two different devices share a common Link they are said to be “linked” together.

To assign Links to a Wall Switch Dimmer open its Edit Device Dialog. In UPB terminology, the dimmer presets on the Wall Switch Dimmer are considered to be Receive Components (because they receive UPB messages on the powerline). There is a special tab on the Edit Device Dialog, called the Receive Components tab, that is used to configure how the dimmer presets behave.

Each row of this tab corresponds to a different dimmer preset on the Wall Switch Dimmer. Each Wall Switch Dimmer has 16 dimmer presets available. Each dimmer preset has a Link Name selector that is used to assign a Link to it.

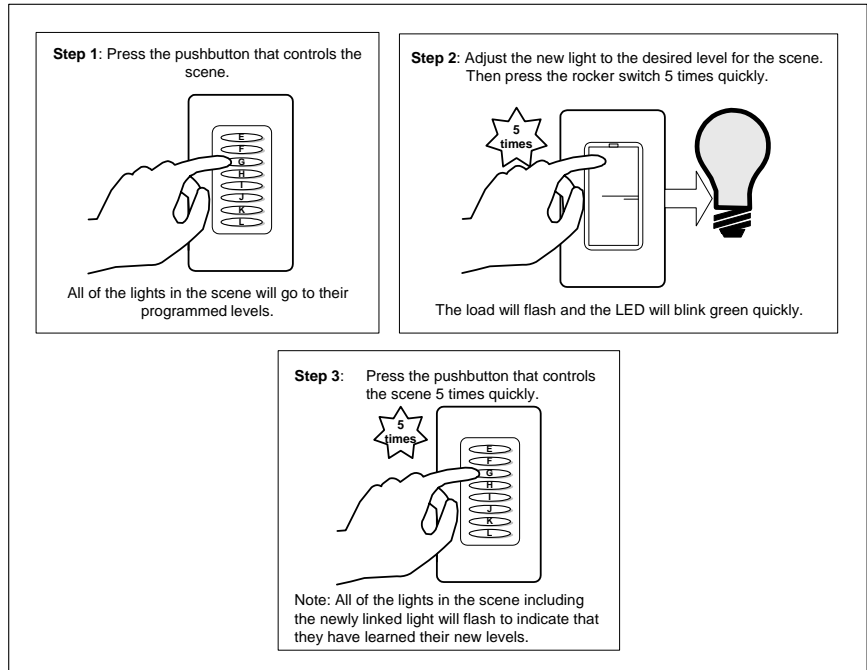


We use the Receive Components tab to assign a corresponding Link to the first available dimmer preset.

Note: there is absolutely no requirement that the first unused dimmer preset be the first one that gets assigned. We could have just as effectively assigned the Link to the fifth, ninth, or any dimmer preset as long as it wasn't already assigned.

Manually Linking A Wall Switch To A Controller Button

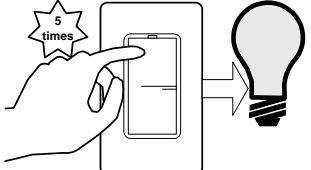
Each WS1D Wall Switch Dimmer comes configured from the factory “linked” to six of the pushbuttons of the 6-Button Controller (see Table 2) and to none of the pushbuttons on the 8-Button Controller. New links can easily be added to your Wall Switch Dimmers by following the steps outlined below.



Manually Unlinking A Wall Switch From A Controller Button

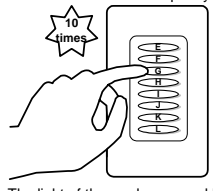
Each WS1D Wall Switch Dimmer comes configured from the factory “linked” to six of the pushbuttons of the 6-Button Controller (see Table 2). Any link between a pushbutton and a Wall Switch Dimmer can easily be removed by following the steps outlined below.

Step 1: Press the rocker switch of the Dimmer you want removed 5 times quickly.



The load will flash and the LED will blink green quickly.

Step 2: Press the pushbutton that controls the scene 10 times quickly.



Note: The light of the newly removed Dimmer will flash to indicate that it has been removed from the Link.

Chapter 6

Configuring Dimmers For Non-Dimming Loads

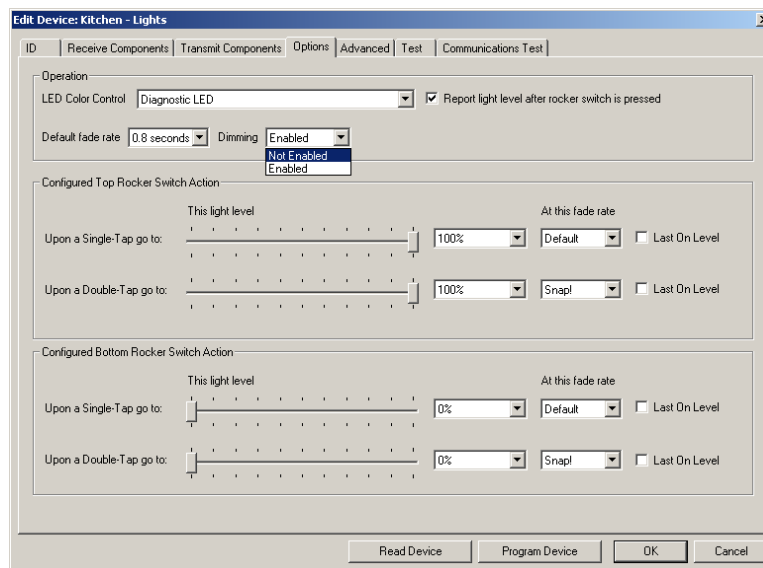
This chapter will explain the steps necessary to configure Wall Switch Dimmers for non-dimming loads.

Why Do I Need To Configure For Non-Dimming Loads?

Some loads, like fluorescent lights and magnetic transformer low voltage lights, do not operate properly when controlled by dimmers that are capable of producing light levels in between 0% and 100%. These types of loads only operate properly as Full ON (100%) and Full OFF (0%) type of loads. The PCS Wall Switch Dimmers are capable of being configured to only produce the Full ON and Full OFF required of these non-dimming devices.

Disabling The Dimming Capability

In order to disable the dimming capability of our Wall Switch Dimmers we use the Edit Device Dialog. This dialog has a special Options tab that is used for configuring options such as the dimming capability.



We go to the Options tab and set the selector for Dimming to “Not Enabled”. To program this configuration into the device we press the “Program Device” button. UPStart performs the necessary command steps to program the configuration data into our device. When the command steps are complete we can press the OK button to close the dialog.

Chapter 7

Making Wall Switch Dimmers That Transmit

Wall Switch Dimmers normally receive and respond to UPB commands but did you know that they could be configured to transmit UPB messages as well? Wall Switch Dimmers can be configured to transmit very similarly to the pushbuttons on the Controllers. Wall Switch Dimmers can also be configured to transmit report messages that include their current Light Level whenever their rocker switch is pressed. This chapter will explain the steps necessary to configure Wall Switch Dimmers for transmitting.

Why Make Wall Switch Dimmers Transmit?

This Wall Switch Dimmer transmit capability can be very useful for doing such things as:

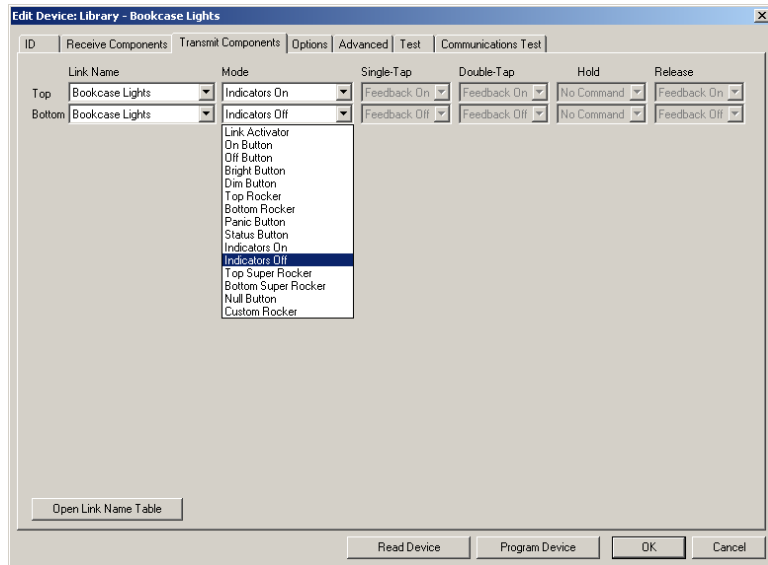
- Sending update commands to controllers' LED indicators when rocker switches are pressed
- Reporting the current Light Level to home automation controllers when rocker switches are pressed
- Using your Wall Switch Dimmer as a two-button controller
- Using your Wall Switch Dimmer as a slave switch without having to run a traveler wire

This chapter will explain the steps necessary to configure your Wall Switch Dimmers to transmit commands and reports on the powerline.

Configuring LED Feedback Transmissions

For our example, we would like each LED indicator on the Controller to turn on whenever the top rocker switch is pressed on the corresponding "linked" Wall Switch Dimmer. We would also like the LED indicator to turn off whenever the bottom rocker switch is pressed. In this way, the LED indicators on the Controller will indicate the current state of the Wall Switch Dimmers.

To do this we will bring up the Edit Device Dialog of the Wall Switch Dimmer. In UPB terminology, the rocker switches on the Wall Switch Dimmers are considered to be Transmit Components (because they transmit UPB messages on the powerline). There is a special tab on the Edit Device Dialog called the Transmit Components tab that is used to configure how the pushbuttons behave.



Each row of this tab corresponds to a different rocker switch on the Wall Switch Dimmer. Each rocker switch (Top and Bottom) has a Link Name selector that is used to assign a Link to a pushbutton. We use the Transmit Components tab to assign each pushbutton to a corresponding Link.

Step 1: Link The Rocker Switches To LED Indicators

We want both the top and bottom rocker switch to update the state of the same LED indicator on the Controller. To do this we assign the Link Name associated with the LED indicator to both the Rocker Top and Rocker Bottom selectors. Since we have other devices to configure we will save the device programming for later.

Step 2: Configure The Button Modes

Next, we assign a Button mode to each rocker switch. This chapter will not go into the details of each transmit mode but, in the case of the Top Rocker we will assign it the “Indicators On” button mode. In the case of the Bottom Rocker we will assign it the “Indicators Off” button mode. Since we have other devices to configure we will save the device programming for later.

Step 3: Configure The Transmission Attempts

For our example, we have found that everything is communicating great. We would like to set all of our Wall Switch Dimmers for a single transmission attempt so that they respond to rocker switch presses a little quicker. To configure the Transmission Attempts we set the selector for the Transmission Attempts to “1”. Since we have other devices to configure we will save the device programming for later.

Step 4: Repeat The Configuration For The Other Wall Switch Dimmers

Repeat steps 1 through 3 for any other Wall Switch Dimmers we might want to configure this way.

Step 5: Program The Configuration Into The Devices

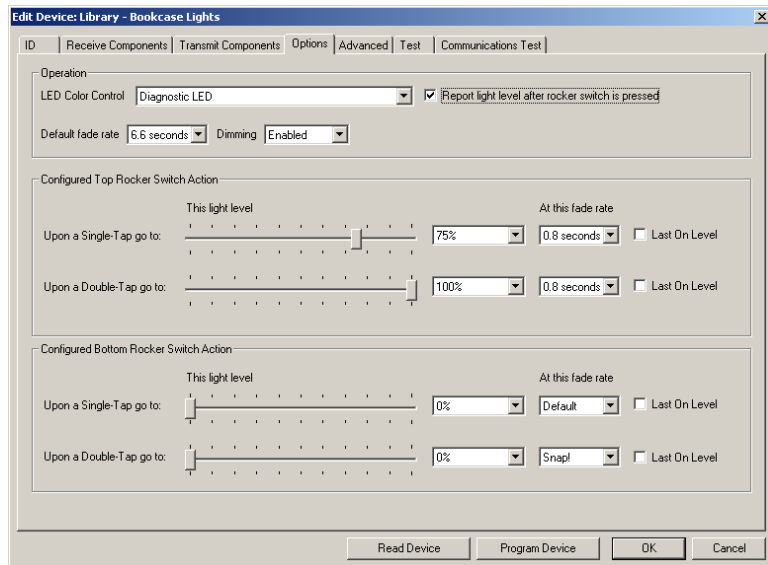
You may have noticed that there is a little red bar underneath one or more of your device icons. This red bar signifies that you have made some change to the network database that hasn't been programmed into that device yet.

Note: For this example, we have saved up all of our configuration changes up until this point. Alternatively, we could have used the “Program Device” buttons on the individual Edit Device Dialogs to program the devices as we went along. This method allows us to test things as we go along but it also tends to make things go a little slower.

To program all of our configuration changes into the devices, select the **Network→Program All Modified** menu item. UPStart will then program all of our saved up configuration changes into the devices. When the programming is complete press the OK button to close the dialog.

Configuring Level Report Transmissions

For our example, we would like each Wall Switch Dimmer to transmit a State Report message that includes its current Light Level whenever a rocker switch is pressed or released. This can be helpful for informing home automation software of light level changes due to switch presses on the Wall Switch Dimmers. In order to configure this we bring up the Transmit Components tab of the Edit Device Dialog for the Wall Switch Dimmers again.



Step 1: Configure State Report Transmissions

To enable the State Report simply check the checkbox that is labeled “Report light level after rocker switch is pressed”. Since we have other devices to configure we will save the device programming for later.

Step 2: Repeat The Configuration For The Other Wall Switch Dimmers

Repeat step 1 for any other Wall Switch Dimmer that you want configured this way.

Step 3: Program The Configuration Into The Devices

To program all of our configuration changes into the devices, select the **Network→Program All Modified** menu item. UPStart will then program all of our saved up configuration changes into the devices. When the programming is complete press the OK button to close the dialog.

Chapter 8

Configuring Transmit Behaviors

The UPB communication method allows for messages to be transmitted multiple times increasing the chance of communication success. Transmitters can be configured to make anywhere from 1 to 4 UPB transmission attempts for each message. This chapter will explain the steps necessary to configure the UPB transmission attempts option on the Wall Switch Dimmer.

Default Transmission Attempts

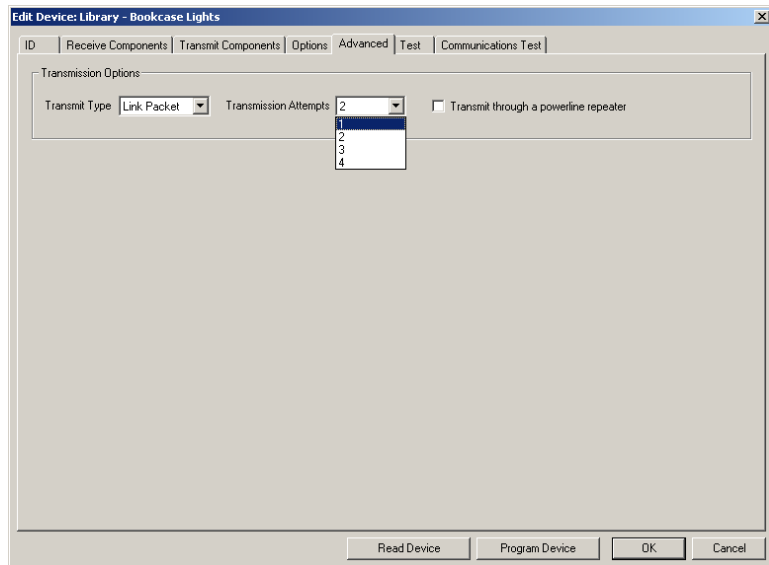
By default, the Transmission Attempts on the Wall Switch Dimmer is set for 2 attempts. This number of attempts has been found to be sufficient to gain well over 99.9% communication success in field-testing.

Changing Transmission Attempts

The default Transmission Attempts is fine for most situations but what if you prefer something else? Suppose you find one module that is having trouble communicating to another module reliably. Suppose all of your devices are communicating great (more probably the case) and you just want them to make one transmission to make things operate quicker. For any of these reasons you might want to change to Transmission Attempts on one or more devices. This can easily be done using UPStart.

Changing To One Transmission Attempt

For our example, we have found that everything is communicating great. We would like to set all of our Wall Switch Dimmers for a single transmission attempt so that they respond to events a little quicker. To configure the Transmission Attempts we again use the Edit Device Dialog of our Wall Switch Dimmer. This dialog has an Advanced tab that is used for configuring transmission options such as the Transmission Attempts.



We go to the Transmit Components tab and set the selector for the Transmission Attempts to “1”. Since we have other devices to configure we will save the device programming for later. To accept this configuration into the network database we press the OK button.

We repeat this procedure for all of our Wall Switch Dimmers. To program this configuration into all of the Wall Switch Dimmers we use the **Network→Program All Modified** menu item.

Note: the Transmit Components tab also has a selector for Transmit Type. This selector is for future and advanced purposes. For the PCS UPB Lighting System devices it is strongly recommended that you keep this selector set as “Link Packet”.

Chapter 9

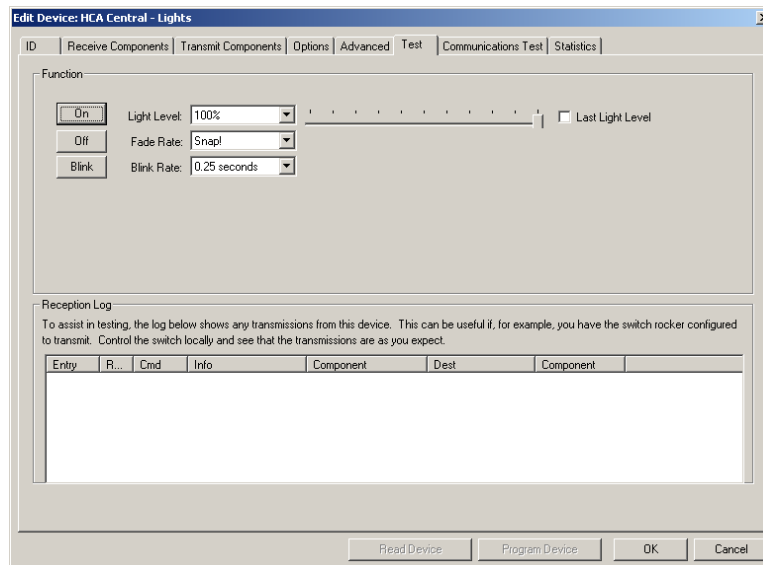
Functionally Testing the Wall Switch Dimmer

After a device's configuration is modified it should be tested to make sure it operates as you expect. UPStart gives you an easy way to do this.

The Device Test Tab

The Edit Device Dialog has a special tab labeled Device Test that allows you to run a functional test on the selected device.

The Device Test tab for a Wall Switch Dimmer is shown below. From this tab you can test that your Wall Switch Dimmer properly turns on to any level at any of 16 fade rates. You can also test that the module can be set to blink its load at any of 16 blink rates.



If your Wall Switch Dimmer has been configured to transmit, you can also see any of its transmissions in the Reception Log when you work with the switch paddle.

Chapter 10

Special Modes Of Operation

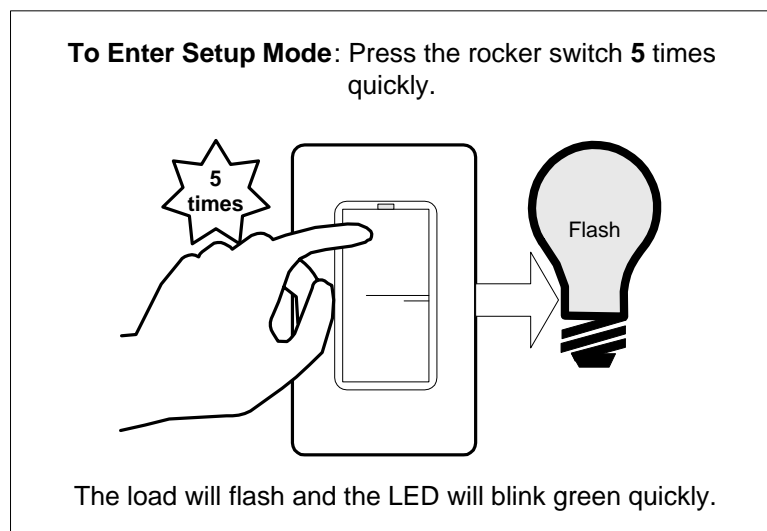
Besides controlling the lighting load, the Rocker Switch is used to put the Wall Switch Dimmer into special modes of operation. This chapter will explain these modes and describe how to enter and exit them.

Setup Mode

Every UPB device has a special mode of operation known as the Setup Mode. Setup Mode is used to allow the device to be setup (either by a UPB Setup Tool or by a UPB Controller). While in Setup Mode the Wall Switch Dimmer will operate normally, it will just be allowed to perform some extra operations needed for device setup.

Entering Setup Mode

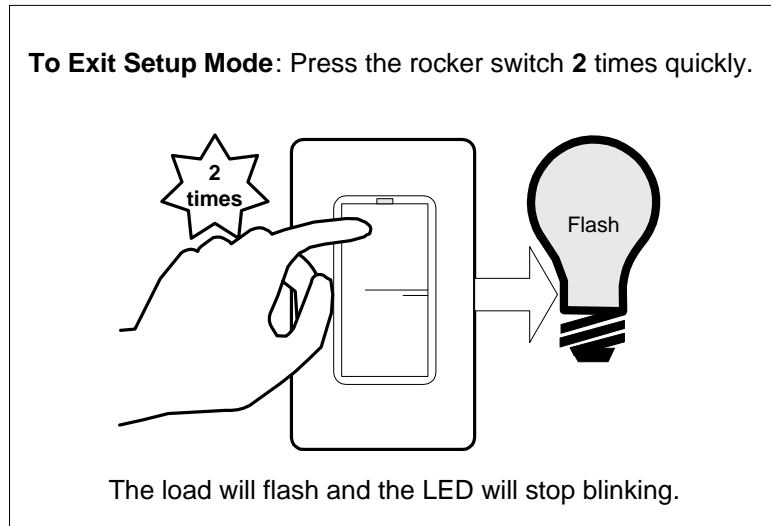
To enter the Setup Mode simply press the Wall Switch Dimmer's rocker switch (top or bottom) 5 times quickly. The Wall Switch Dimmer will indicate that it is in Setup Mode by flashing its lighting load and then blinking its Status LED green.



Note: the Wall Switch Dimmer will automatically time-out of Setup Mode after approximately five minutes.

Exiting Setup Mode

To exit the Setup Mode simply press the Wall Switch Dimmer's rocker switch (top or bottom) 2 times quickly. The Wall Switch Dimmer will indicate that it is out of Setup Mode by flashing its lighting load and then stop blinking its Status LED.



Note: the Wall Switch Dimmer will automatically time-out of Setup Mode after approximately five minutes.

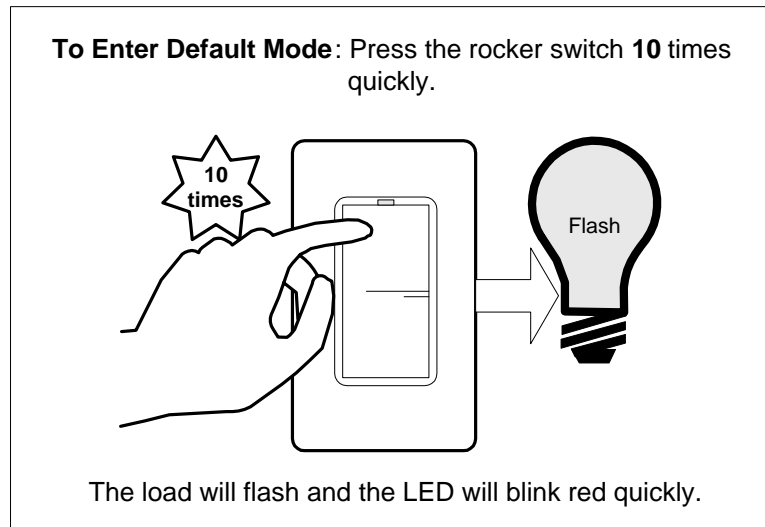
Factory Default Mode

The Wall Switch Dimmer can be set back to its factory default configuration by entering it into Factory Default Mode. Once the Wall Switch Dimmer is put into Factory Default Mode its configuration registers will be set back to the same values they were when the device first came from the factory. While in Factory Default Mode the Wall Switch Dimmer will continue to operate normally.

Entering Factory Default Mode

The Factory Default Mode can only be entered from the Setup Mode. Follow the instructions above for entering the Setup Mode and then proceed to put the Wall Switch Dimmer into Factory Default Mode.

To enter the Wall Switch Dimmer into the Factory Default Mode simply press the Wall Switch Dimmer's rocker switch (top or bottom) 10 times quickly. The Wall Switch Dimmer will indicate that it is in Factory Default Mode by flashing its lighting load and then blinking its Status LED red.



Note: the Factory Default Mode can only be entered from the Setup Mode.

Exiting Factory Default Mode

The Wall Switch Dimmer can be taken out of the Factory Default Mode in the exact same manner it is taken out of Setup Mode (e.g. double-tapping the rocker switch).

Note: the Wall Switch Dimmer does not time out of the Factory Default Mode.

Chapter 11

Getting Help

The UPStart setup tool can be a complex program. As you use UPStart, you may find that you have questions about how to do some things, or you may find an area where UPStart doesn't behave as you expect.

Outlined below are some procedures and resources available to help resolve problems if you find yourself in a situation where you think you need help.

Before you look too far for answers, make sure that you don't already have the information you are looking for. Check the User Guide carefully for the feature with which you are having problems. Make sure that you are following the directions completely and carefully.

Our web site

If you are still having problems, the next place to look is the PCS Technical Support web site that contains extensive resources for UPStart. The web site is located at:

<http://www.pcslighting.com>

Some of the information available on the web site includes:

- A list of frequently asked questions. Your questions may already be answered there.
- Technical Notes on some areas that are not covered fully in the User Guide.
- Links to the web sites for manufacturers of those UPB devices that UPStart works with.

If none of the Internet resources helps you fully resolve your problem, the PCS technical support staff will work closely with you to solve any problems related to our software.

Other considerations

While our support personnel will do their best to help you with your software related problems, we know that on occasion a problem can be traced to hardware or to another software application. We will supply as much help as we can, but we can't provide support for products manufactured or published by another company. If you are having problems with your video display or printer, please make sure that you have the most current drivers for them. These can usually be found by contacting your computer manufacturer directly.

Finally, this product is designed to be used on PCs configured with the current versions of Microsoft Windows. This means that we tested for those configurations, and not every operating environment that you might encounter. Any non-standard hardware or software you have may be at the root of your problem. If possible, please disable all such devices to be sure that they are not causing your problem.

Technical support

Unlike other companies you may have worked with, PCS provides technical support that is available using e-mail. You might find that e-mail is a more satisfying way to get technical support. You won't be put on hold, and the technician will have time to fully consider your problems and formulate an answer.

Technical support can be reached either from the bug reporting form on the support web site, or directly by sending e-mail to:

Support@PCSLighting.com

To receive the fastest response to your technical questions, please include the responses to ALL of the following items in your e-mail.:

- What is the exact sequence of events that created the problem? Make sure that you can reproduce the problem by following the same series of steps.
- What is the version number of UPStart? To get the version number from the Help menu, choose About UPStart.
- What is the type of computer you are using and what is the version of Windows in use? The operating system version number can be found using the control panel *System* applet.
- Provide the exact wording of any error messages.

Software is very complex and a program like UPStart is a very complex program. While the programmers try extra hard to get it right, sometime problems happen. If you find a problem please report it in a way that helps us find it and fix it.

Reporting a bug is an art that everyone should learn regardless of what software you are working with. It is vital that you provide all the information you can. The absolutely most important thing you can do is to tell us how to reproduce the bug. Sometimes this is easy. "Open my design file, select the device called *Bathroom Lights* select the Edit Device operation and UPStart dies".

Now sometimes you can't reproduce the problem. So give us suggestions. For example, if you have a problem where occasionally UPStart crashes try and determine what might have been happening at that time. Were you working with the user interface? Was UPStart just sitting there? Do you think that it died when some controller pushbutton got pressed? Guess. Theorize. Be a detective. Try and reproduce the problem yourself. Give us all the information you have: "UPStart dies sometimes at night. I think it has to do with my bathroom light being on. Attached is my UPStart file".

The more information you provide the quicker the problem can be identified and fixed.

Hardworking programmers everywhere thank good bug reporters.