

USING UPB LIGHTING DEVICES WITH HOMEVISION OR HOMEVISION-PRO

1.0 INTRODUCTION

This application note details how to use Universal Powerline Bus (UPB) lighting devices from Powerline Control Systems with HomeVision or HomeVision-Pro (both referred to herein as HomeVision). HomeVision does not contain built-in support for the UPB devices. However, UPB devices can be used with the “Custom lighting” feature available in HomeVision version 3.4 and higher. This requires the user to copy two prewritten macros into their HomeVision schedule and to set a few controller options. This UPB feature uses about 2% of HomeVision’s memory.

This application note should provide enough information to allow users to get their UPB devices working with HomeVision. Those wanting more details on how the custom lighting feature works can refer to the “Custom lighting” file installed in the HomeVision directory. Those needing more details on UPB should contact Powerline Control Systems or their hardware manufacturer.

2.0 REQUIREMENTS FOR USING UPB DEVICES WITH HOMEVISION OR HOMEVISION-PRO

You must have the following to use UPB devices:

- A UPB Powerline Interface Module (PIM) with firmware version 4.15 or higher. This version provides a “Message Mode” that is required for use with HomeVision.
- An unused HomeVision or HomeVision-Pro serial port to connect the PIM to. For HomeVision, the use of an add-on HomeVision-Serial or HomeVision-Phone/Serial device is strongly recommended. For HomeVision-Pro, ports 3 or 4 are recommended, although a HomeVision-Phone/Serial add-on device can also be used. **The PIM requires that the serial port’s “DTR” line tied be to 5V, which the HomeVision and HomeVision-Pro serial ports do not do. Contact Custom Solutions, Inc. to obtain a serial port that can support the PIM or instructions for modifying an existing port.**
- UPB software to configure the UPB devices. The software, such as UPStart, should be provided by your UPB supplier.
- HomeVision or HomeVision-Pro version 3.4 or higher. This requires both a version 3.4 PROM installed in the unit, as well as the 3.4 PC software.
- The HomeVision schedule file “UPB control.haf” and a “RampRates.txt” file. The schedule file contains pre-written UPB macros. The “Control Macro” runs whenever a UPB command is performed. The “Receive Macro” runs whenever a UPB message is received. These macros perform the serial interface commands needed to communicate with the PIM. The “RampRates.txt” file tells HomeVision what ramp rates the UPB devices support. These files are provided by Custom Solutions, Inc. and are available free on our web site at: www.csi3.com/UPB.

3.0 HOW TO USE UPB DEVICES WITH HOMEVISION

3.1 Step 1 – Install and Configure UPB devices

The UPB devices should be installed and configured according to instructions provided with the devices or by the installer. This application note assumes the reader is familiar with how to do this. If you need help, contact Powerline Control Systems or the UPB device manufacturer.

We recommend reading this entire application note before deciding what Network ID and Device ID (also called Unit ID) numbers to assign to your UPB devices. Record the numbers – this information will be needed when configuring the HomeVision software. If you want HomeVision to know when a switch is manually changed, you must configure the switch to transmit its new state after the change. You can do this from within UPStart by enabling the “Report light level after rocker switch is pressed” option on the “Transmit Components” tab for the light. During the UPB device configuration process, you will probably have the UPB Powerline Interface Module (PIM) connected to a PC. When complete, you’ll connect the PIM to HomeVision.

Each UPB device is set to a “Network ID” number and a “Device ID” number. There are several important things to understand when assigning these numbers to your devices:

- All devices must have the same Network ID number.
- **In order for HomeVision to properly receive messages from the UPB device and properly track device status, the “Device ID” number must match the “Light ID” number.** “Device ID” number refers to the ID you set for the switch itself via the UPB setup software. “Light ID” number refers to the ID # field on the Custom Lighting Screen in the HomeVision software.

When HomeVision receives a message from the UPB network that indicates a device has changed to a new state (On at 50%, Off, etc.), the HomeVision Receive Macro looks at the “Device ID” number in the UPB message. It then finds the light that has the same “Light ID” number and sets that’s light internal state tracking variable to the value contained in the message. If you use different numbers for the Light ID and Device ID, HomeVision will incorrectly track the status.

- You generally shouldn’t assign a device to Light ID number zero. UPB Device ID numbers should start at one (UPB uses zero for a “broadcast” message). Since you won’t have a UPB Device ID number of zero, you shouldn’t use Light ID number zero in the HomeVision software for a device. You may ignore it, or you might use it for a “Link” (Scene) command, as described later.
- Following is an example of a typical way to number your devices:

Light ID 0: Unused		
Light ID 1: Front door light	Network ID = 1	Device ID = 1
Light ID 2: Back door light	Network ID = 1	Device ID = 2
Light ID 3: Front yard lights	Network ID = 1	Device ID = 3
Light ID 4: Dining room	Network ID = 1	Device ID = 4
Light ID 5: Living room	Network ID = 1	Device ID = 5
Light ID 6: Family room	Network ID = 1	Device ID = 6

3.2 Step 2 – Install PIM

During normal operation, the UPB PIM must be connected to a HomeVision or HomeVision-Pro serial port. Use a standard serial cable when connecting the PIM to HomeVision or HomeVision-Pro serial ports 2, 3, or 4. If you’re using serial port 1 (not recommended), use a null modem cable, or a standard cable with a null modem adapter. As noted previously, the PIM requires that the serial port’s “DTR” line tied be to 5V, which the HomeVision and HomeVision-Pro serial ports do not do. Contact Custom Solutions, Inc. to obtain a serial port that can support the PIM or instructions for modifying an existing port.

You must also configure the HomeVision serial port to communicate with the PIM, as follows:

1. Open the "Expansion Board Configuration Screen" under the "Configure" menu
2. Select the "Other" tab
3. Enable the serial port by checking the appropriate box
4. Set the baud rate to 4800
5. Set the timeout to 25ms (although this setting normally won't have any impact)
6. For the HomeVision-Serial add-on ports or HomeVision-Pro built-in ports, set the duplex mode to full
7. For the HomeVision-Serial or HomeVision-Phone/Serial add-on ports, select the board version (I or II)
8. Click "Done"

3.3 Step 3 – Install RampRates.txt File

Place the text file named "RampRates.txt" into the same directory as the HomeVision application. The HomeVision software will read this file each time it starts up. This file tells the software what "ramp rates" the UPB devices support. The file contains the information shown below:

```
UPB Ramp Rates
0 = instantly
1 = over 0.8 seconds
2 = over 1.6 seconds
3 = over 3.3 seconds
4 = over 5 seconds
5 = over 6.6 seconds
6 = over 10 seconds
7 = over 20 seconds
8 = over 30 seconds
9 = over 1 minute
10 = over 2 minutes
11 = over 5 minutes
12 = over 10 minutes
13 = over 15 minutes
14 = over 30 minutes
15 = over 60 minutes
```

3.4 Step 4 - Configure the HomeVision Software

Next you must configure the "Custom Lighting" feature so it can control UPB devices. This requires setting up two pre-written macros that will perform the UPB functions. Proceed as follows:

1. In your schedule file, open the "Variable Summary Screen" under the "Objects/Events" menu:
 - a. Click the "Add Variable" button repeatedly, or click once and then hold down the ENTER key, to add variables. Continue until variable 250 or higher is reached
 - b. Enter the following names for variables 243 through 250:
 - Variable #243 name = "UPB network ID"
 - Variable #244 name = "Temporary"
 - Variable #245 name = "UPB light number"
 - Variable #246 name = "UPB light device ID"
 - Variable #247 name = "UPB type"
 - Variable #248 name = "UPB light command"
 - Variable #249 name = "UPB light data 1"
 - Variable #250 name = "UPB light data 2"
 - c. For variable #243 (UPB network ID), double-click the "Initial Value" field and enter the Network ID number of your UPB Devices. Click "OK"
 - d. Click "Done"

2. Open the “Macro Summary Screen” under the “Objects/Events” menu:
 - a. Click the “Add Macro” button repeatedly, or click once and then hold down the ENTER key, to add macros. Continue until macro 250 or higher is reached
 - b. Name macro #249 “UPB Receive Macro”
 - c. Name macro #250 “UPB Control Macro”
 - d. Click “Done”

NOTE: You can choose any macro numbers for these macros – they don’t have to be 249 and 250. Use your macro numbers where this application note refers to macros 249 and 250.

3. Select “Custom Lighting” from the “Configure” menu:
 - a. Select the “User-created macro and variables method”
 - b. If you’re not using X10 (or possibly even if you are), you may want to check the “Swap X-10 and lighting buttons on Toolbar” option. When you do this, the X10 button will be replaced by “Lighting” button (shown as a light bulb). This provides an easy way to access the custom lighting commands. If you don’t select this option, you can access the lighting commands from the pop-up menu under the “Other” button.
 - c. Set the “Maximum light level” value to 100 (this is the default value)
 - d. For “Macro”, select macro #250 (UPB Control Macro)
 - e. For “ID number variable”, select variable #245 (UPB light number)
 - f. For “Address variable”, select variable #246 (UPB light device ID)
 - g. For “Extra byte variable”, select variable #247 (UPB type)
 - h. For “Command variable”, select variable #248 (UPB light command)
 - i. For “Data value 1 variable”, select variable #249 (UPB light data 1)
 - j. For “Data value 2 variable”, select variable #250 (UPB light data 2)
 - k. Click “OK”
 - l. Save your schedule file

4. Copy the UPB Receive Macro into your schedule file:

NOTE: The instructions below close your schedule file and open another one to copy the macro. Alternatively, you can start a second copy of the software and open both schedule files simultaneously.

- a. Open the HomeVision schedule file named “UPB Control.haf”. Note that if you’re using the HomeVision-Pro software to open this file, it will ask if you want to convert the file to the HomeVision-Pro format. Click “OK”.
- b. Open the “Macro Summary Screen” under the “Objects/Events” menu
- c. Scroll down to the end of the macro listing. There will be three UPB Receive Macros (macros 247, 248, and 249). Each macro uses a different HomeVision or HomeVision-Pro serial port for communicating with the UPB PIM. Select the “Actions defined” field for the Receive Macro corresponding to the serial port your PIM is connected to
- d. Right-click in the “Actions defined” field and select “Copy” from the pop-up menu
- e. Open your schedule file
- f. Open the “Macro Summary Screen” under the “Objects/Events” menu
- g. Scroll down to the end of the macro listing and select the “Actions defined” field for macro #249 (UPB Receive Macro)
- h. Right-click in the “Actions defined” field and select “Paste” from the pop-up menu
- i. Click “Done”
- j. From the “Objects/Events” menu, open the “Serial Data Input Event” for the serial port your PIM is connected to
- k. Enter a macro command to run macro #249 one time. This causes the UPB Receive Macro to run each time a serial message is received from the PIM
- l. Click “OK”

- m. Save your schedule file
5. Copy the UPB Control Macro into your schedule file:
 - a. Open the HomeVision schedule file named "UPB Control.haf" or HomeVision-Pro schedule file named "UPB Control - Pro.haf"
 - b. Open the "Macro Summary Screen" under the "Objects/Events" menu
 - c. Scroll down to the end of the macro listing. There will be three UPB Control Macros (macros 250, 251, and 252). Each macro uses a different HomeVision or HomeVision-Pro serial port for communicating with the UPB PIM. Select the "Actions defined" field for the Control Macro corresponding to the serial port your PIM is connected to
 - d. Right-click in the "Actions defined" field and select "Copy" from the pop-up menu
 - e. Open your schedule file
 - f. Open the "Macro Summary Screen" under the "Objects/Events" menu
 - g. Scroll down to the end of the macro listing and select the "Actions defined" field for macro #250 (UPB Control Macro)
 - h. Right-click in the "Actions defined" field and select "Paste" from the pop-up menu
 - i. Click "Done"
 - j. Save your schedule file

3.5 Step 5 – Add UPB Devices to HomeVision Software

Next, add your UPB devices to the custom light list:

1. Open the "Custom Lighting Summary Screen" under the "Objects/Events" menu
2. Click "Add light" to add as many UPB devices as you have.
3. Give a name to each light
4. In the "Address" field, enter the "Device ID" number (also called "Unit ID") that you previously assigned to it
5. Leave the "Extra Byte" field at the default value of 0 (zero)
6. Select the "Load Name" option if you want the light's name to be loaded into the HomeVision or HomeVision-Pro controller for display on a TV
7. Check the "Light enabled" option (this is the default setting)
8. If desired, set the "Power Fail State". Most UPB users would leave this at the default setting of "No change"
9. Click "Done"
10. Save your schedule file

Next, if you are using UPB "link ID" numbers to group lights together or perform scenes, add each link to the custom light list:

1. Open the "Custom Lighting Summary Screen" under the "Objects/Events" menu
2. Click "Add light" to add as many UPB links as you have.
3. Give a name to each link. You might give it a name that describes what the link does, such as "Link: All lights on", or you might name it for the lights that are grouped together, such as "Link: All outdoor lights"
4. In the "Address" field, enter the "Link ID" number
5. In the "Extra Byte" field, enter 1 (one). This indicates to the Control Macro that this is a link, not a light
6. Select the "Load Name" option if you want the link's name to be loaded into the HomeVision or HomeVision-Pro controller for display on a TV
7. Check the "Light enabled" option (this is the default setting)
8. Leave the "Power Fail State" at the default setting of "No change"
9. Click "Done"
10. Save your schedule file

You're now ready to use commands in your schedule to control these UPB devices.

4.0 COMMAND USAGE

4.1 Entering UPB Commands in your Schedule

To enter UPB commands, use the "Lighting" button on the Actions Entry Screen Toolbar. If you selected the "Swap X10 and lighting buttons on Toolbar" option during the configuration, the lighting button will be found at the top of the Toolbar (with a light bulb icon). Otherwise, it will be in the pop-up menu under the "Other" button.

The following commands are available to control a single light:

- Light ## off ***
- Light ## on ***
- Light ## toggle
- Light ## brighten XX times
- Light ## dim XX times
- Light ## to level XX at rate YY ***
- Light ## to level in variable XX at rate YY ***
- Light ## refresh (command light to whatever level HomeVision currently thinks light is at)

*** These commands can also be used on a "link" to control the lights as group

The following command can be used to activate a UPB "link" (performing what HomeVision calls a "scene" command):

- Light ## select scene XX

The following commands don't send any commands to the UPB devices. Instead, they set the internal variables that HomeVision uses to track the devices' states (on, off, level, etc.). Most users won't need these commands.

- Light ## set state to OFF
- Light ## set state to ON at level XX
- Light ## set state to ON at level in variable XX
- Light ## set state to ON at unknown level
- Light ## set state to UNKNOWN
- Set state of current light to OFF
- Set state of current light to ON at level in variable XX
- Light ## put current level into variable XX

The following sections provide more details on some of these commands.

4.2 On, Off, and Toggle Commands

The On command turns the light (or link) on at 100%. The Off command sets the light (or link) off by setting the level to 0%. The Toggle command sets the light (or link) off if it's currently on, and sets it on at 100% if currently off.

4.3 Brighten and Dim Commands

UPB devices do not directly support "Brighten" or "Dim" commands. However, HomeVision provides a way to use such commands. HomeVision tries to keep track of the device levels. When you perform

a command such as “Brighten 10 times”, HomeVision will add 10 to what it thinks the current level is, and then command the UPB device to go to that level. There are 100 steps over the full range of level 0 to 100. A “Brighten 10 times” command will increase the brightness 10%. Similarly, a “Dim 20 times” command will decrease the brightness 20%. There is one limitation of this approach: if the device is at a different level than HomeVision thinks it is, the device will end up at the wrong level. This problem mainly occurs if a user manually changes a light and the light doesn’t report its status. Setting your UPB devices to report their status will prevent this problem.

4.4 Level (Ramp) Commands

The “Level ##” commands (also called “Ramp” or “Fade” commands) set the light (or link) to the specified level (a percent value between 0 and 100) at the specified ramp rate. The allowable rates for UPB devices are shown below.

Ramp Rate	Ramp Time (0% – 100%)	Time Per Step
0	Instantly	0
1	0.8 seconds	4.167mS
2	1.6 seconds	8.333 mS
3	3.3 seconds	16.67mS
4	5 seconds	5mS
5	6.6 seconds	33.3 mS
6	10 seconds	50 mS
7	20 seconds	100 mS
8	30 seconds	150 mS
9	1 minute	300 mS
10	2 minutes	600 mS
11	5 minutes	1.5 seconds
12	10 minutes	3 seconds
13	15 minutes	4.5 seconds
14	0.5 hours	9 seconds
15	1.0 hour	18 seconds

4.5 Group and Scene Commands

UPB devices support what are called “Links”. You configure links using the UPB software. Links are referred to by Link ID numbers, which can range from 1 to 250. Each UPB device can be a member of up to 16 links. UPB commands can be sent to individual lights or to links. When sent to a link, all devices that are members of that link will respond. Thus, links provide a means to control a group of lights simultaneously with a single command. Each link should be entered into the “Custom Lighting Summary Screen” (and thus represent a group of lights, not an individual light).

There are two general ways to use links with HomeVision:

1. “Scene” method. A “Scene” command is performed to set all devices in the link to their predefined levels. For example, you may use the UPB software to put three lights into Link 1. One light may be configured to go to 50%, another to 75%, and the third to 90%. HomeVision can then perform a Scene Command (using the UPB “Activate Link 1” command) to set all three lights to these preset levels. Since each light can be set to go to a different level, complex scenes are possible.
2. “Group” method. Regular commands (On, Level ##, etc.) are performed on a link (instead of on a light). When performed on a link, all devices in that link will respond the same way to the command. For example, a “Link 1 to Level 50%” command will cause all lights in link 1 to go on at 50%. When used this way, you can think of the link ID as representing a group of lights.

It's important to note the differences between these two methods. With the Scene method, different Link ID numbers are required for each scene, and the devices must be configured accordingly. For example, if you want one scene for all lights on 100%, another scene for all lights on 50%, and a third scene for all lights off, you have to configure three links for each switch. In contrast, with the Group approach, you would only have to configure one link for each switch. You'd then perform one of three commands ("Link 1 to Level 100%", "Link 1 to Level 50%", or "Link 1 Off") to put all the lights at the desired level. Thus, you could set all the lights to any level without having to create a separate link for each level.

The group method has the limitation that all the devices in the link will go to the same state (i.e., they'll all be on at the same level or off). In contrast, the Scene method allows all lights in the link to be at different levels.

In summary, if you want different lights to go to *different* levels, create a link where the desired levels are preconfigured, and use the HomeVision Scene command to activate that link. When you want to be able to control a group of lights simultaneously, *where they all go to the same level*, use the group method (the scene method will also work, but requires more configuration). Both methods are discussed in more detail below.

4.5.1 Scene Commands

When you want to be able to set a group of lights to different levels, use this method. You must first configure the UPB devices by putting them into the same link at the desired levels. In the HomeVision software, you must put an entry in the "Custom Lighting Summary Screen" for this link. Put the Link ID number in the "Address" field. Put a 1 (one) in the "Extra Byte" field (this tells the Control Macro to perform a Link command).

You use the "Scene" command within HomeVision to activate the scene. When entering the Scene command, select the link instead of an individual light from the light list. Although the HomeVision software will allow you to enter a Scene Number for the command, you don't need to do this. The Scene Number is ignored for UPB devices (the Scene Number is obtained from the "Address" field instead).

When you perform a Scene Command, HomeVision will not properly track the state of the devices that are changed. This is because the devices won't report their new states to HomeVision when they are changed by a UPB message (even if their "Report light level after rocker switch is pressed" option is enabled). If you wish, there is a way to tell HomeVision what the correct state is for each device in a scene, but it requires programming by the user. Here's the general process:

1. Open the UPB Control Macro
2. Scroll down to the comment "USER CAN ENTER SCENE COMMAND EFFECTS HERE"
3. There are separate IF-THEN statements for several scene numbers (you can add more IF-THEN statements if you use more scenes). Variable #246 holds the scene number. Inside the THEN section of each scene, enter commands that set the light tracking variables to the levels for that scene. For example, if Scene 1 sets light 1 to 75% and light 2 to off, do this:

```
If
  Var #246 (UPB light device ID) = 1
Then
  ` Scene 1 - Set light tracking variables to proper states:
  Light #1: Set tracking state to On at 75% (level 75)
  Light #2: Set tracking state to Off
End If
```

If you later change how a device responds to a scene command, you will need to update the macro accordingly.

4.5.2 Group Commands

When you want to be able to control a group of lights simultaneously, where they all go to the same level, use this method. You must first configure the UPB devices by putting them into the same link. In the HomeVision software, you must put an entry in the “Custom Light Summary Screen” for this link. Put the Link ID number in the “Address” field. Put a 1 (one) in the “Extra Byte” field (this tells the Control Macro to perform a Link command).

You can use any of the following commands on the group of lights:

- Light ## off
- Light ## on
- Light ## to level XX at rate YY
- Light ## to level in variable XX at rate YY

When entering this command, select the link instead of an individual light from the light list.

You should not use the following commands on a link, as they may behave unexpectedly:

- Light ## toggle
- Light ## brighten XX times
- Light ## dim XX times

When you perform a command on a group of lights, HomeVision will not properly track the state of the devices that are changed. This is because the devices won't report their new state to HomeVision when they are changed by a UPB message (even if their “Report light level after rocker switch is pressed” option is enabled). If you want HomeVision to be able to track the light status, you should instead use the Scene Commands described above and add commands to the Control Macro to indicate the status for each scene.

5.0 RECEIVING UPB MESSAGES

Most of what is discussed above relates to sending commands to UPB devices. It is also possible for HomeVision to receive UPB messages and take action. This is done within the UPB Receive Macro. There are several types of messages the Receive Macro can decode and respond to. Some of these require you to edit the macro to make it do what you want. These are discussed in the following paragraphs.

As discussed previously, you can configure UPB switches to report their new state when they are manually changed. The report will be in the form of a “Device State Report” message. The Receive Macro has been written to decode this message and update HomeVision's internal state tracking variables accordingly. You do not need to edit the macro in order for this to function.

It is possible that you could have other devices in your home that can control UPB switches. These devices may transmit UPB “Go To” or “Start Fade” messages to control the switch. When they do, the Receive Macro will detect these messages and update HomeVision's internal state tracking variables accordingly. You do not need to edit the macro in order for this to function.

You may also have devices that can send “Scene” commands (i.e., UPB “Activate Link” commands) to UPB switches. The Receive Macro can detect when one of these commands is sent. The macro doesn't take any action with this information, but you could modify the macro to do so. In the macro, look for the message “Do whatever you want when this ‘Activate Link 1’ command is received”. You can enter there any actions you want to perform when HomeVision receives an Activate Link 1 command over the UPB bus. You can do the same thing for any link ID number (edit one of the

existing IF-THEN conditions or add a new one). Also, you could put in commands that tell HomeVision what the correct state is for each device in the scene, allowing HomeVision to track light status even when external devices trigger the scene.

Finally, because the macro will run whenever any serial message is received from the PIM, it could be modified to decode and respond to any other UPB message. This should only be attempted by users who understand the UPB message format. Refer to PCS documentation for more details on this.

6.0 ADDITIONAL TECHNICAL DATA

6.1 HomeVision Control and Receive Macros

Following are some notes on how the HomeVision “Control Macro” and “Receive Macro” function:

- When the Control Macro sends a UPB command, it uses a “Sending Device ID” of 255 (FF hex). If you want to use a different ID for some reason, you can edit the UPB Control Macro.
- The Control Macro controls devices with the “GoTo” command, not the “Fade Start” and “Fade Stop” commands.
- The Receive Macro looks for three types of UPB messages and uses them to update its internal state tracking table:
 - State Report messages
 - GoTo messages
 - Start Fade messages

6.2 UPB Powerline Interface Module (PIM) Information

- The PIM serial port uses a baud rate of 4800 with no start bits, eight data bits, and one stop bit.
- The PIM supports both a “Message Mode” and a “Pulse Mode”, but it must be used in the Message Mode. The PIMs are shipped from the factory in this mode, so you shouldn’t need to change it. Once a PIM is set, it will stay in that mode even if power is removed.
- If a PIM is in the Pulse Mode and you want to set it into the Message Mode, there are two ways to do that. One is to write bit #1 of Setup Register 0x70 to a logical 1 using the “Write PIM Registers” command:

```
<ctl-W>70028E<cr>
```

The other way to set the PIM into the Message Mode is to have the user manually set the PIM back to its Factory Defaults using the PIM’s Program pushbutton as follows:

Step	Operation
1	Press the Program pushbutton five times quickly in a row
2	The LED should start to blink green to indicate it is in Setup Mode
3	Press the Program pushbutton ten times quickly in a row
4	The LED should start to blink red to indicate that Factory Defaults have been set
5	Press the Program pushbutton one more time
6	The LED should stop blinking to indicate that it is ready for normal operation

- The PIM will use its LED to indicate the status of the UPB network. Whenever the PIM transmits a UPB message, it will indicate so by pulsing the status LED red. Whenever the PIM receives a valid UPB message, it will indicate so by pulsing the status LED green. Whenever the PIM receives a rejected UPB message, it will indicate so by pulsing the status LED black (off).
- The PIM has two special modes that it can be put into: SETUP Mode and Factory Default Mode. When the PIM is in SETUP Mode it will indicate so by blinking its status LED alternately between green and black. When the PIM is in Factory Default Mode it will indicate so by blinking its status LED alternately between red and black.

6.3 UPB Switch Information

- A switch enters the SETUP Mode when either Rocker Switch is multi-clicked exactly 5 times. Once in the SETUP Mode, the switch exits the SETUP Mode and enters the Normal Mode when either Rocker Switch is multi-clicked exactly 2 times.
- Rocker actions:

Rocker Event	Dimmer Action (Top Rocker)	Dimmer Action (Bottom Rocker)
Single-Click	Fade to 100% at the Default Fade Rate	Fade to 0% at the Default Fade Rate
Double-Click	Snap to 100% at Fade Rate #0	Snap to 0% at Fade Rate #0
Hold	Start fading to 100% at the Default Fade Rate	Start fading to 0% at the Default Fade Rate
Release	Stop fading the Light Level	Stop fading the Light Level

6.4 UPStart Software Information

- Connect the PIM to a PC serial port using a standard 9-pin serial cable (the same as used to connect HomeVision to a PC).
- Select “UPB Interface” from the “Tools” menu. Select “Powerline interface module” for “Interface”. Select the PC serial port the PIM is connected to. Click “Test” to verify the software can communicate with the PIM.

To configure a new device (switch):

- Select “Add ...” from the “Device” menu. This launches the “Add device wizard”. Then:
 1. Put the switch into the SETUP mode. Click “Next”. It will report the results and data. Click “OK”.
 2. Enter a room name, device name, and unit ID (same as device ID). Click “Next”. This will write the new information into the switch. The switch will also exit the SETUP mode. Click “OK”.

After adding all the devices, select “Save” from the “File” menu.

Double-click a device to configure how the device works or to test it.