



INSTEON Plugin

Girder 4.0



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Table of Contents

1. Introduction	1
2. Installation	2
3. INSTEON Overview.....	3
4. Configuration	5
4.1 Overview of Device Configuration	6
4.2 Message Monitoring	7
4.3 Smarthome DM Tab.....	8
4.4 PLC Manager Tab	10
4.5 Device Manager Tab	12
4.6 Group Manager Tab	15
4.7 Link Manager Tab.....	18
4.8 KeypadLinc Manager Tab.....	19
4.9 Copy/Replace Tab	22
4.10 Group Duplication Tab.....	23
5. Event Reference.....	24
6. Action Reference	25
6.1 Device Level	26
6.2 Device Command	27
6.3 Group Command.....	28
6.4 Device Send	29

1. Introduction

The Girder 4 Insteon plugin provides complete control and real time monitoring of SmartHome INSTEON automation devices. The plugin uses the SmartHome PowerLinc V2 Controller device and Smarthome Device Manager software (<http://www.smarthome.com/>).

The Plugin is for Girder 4 Pro or later.

Contents

1. Introduction
2. **Installation**
3. **INSTEON Overview**
4. **Configuration**
5. **Event Reference**
6. **Action Reference**

Features

- Control of any INSTEON device.
- Real time monitoring of all INSTEON device states tracking local changes, group changes and dimming level.
- Real time monitoring and optional logging of all INSTEON communications.
- Group control of devices including on/off/dim/bright.
- Easy linking of devices to the PLC.
- Device Manager for naming devices, monitoring status and communication with each device and link database display and editing.
- Monitoring of communication reliability for each device.
- Polling of devices that do not report changes in status.
- Automatic device detection using links in known devices.
- Automatic tracking and updating of device links.
- Sophisticated Link Management, including detection and repair of broken links, removal of all references to a device, creation and deletion of links and link reuse.
- Sophisticated Group management, including creation of groups, modification of device settings in each group, and copying groups from one device to another.
- Device Removal and Replacement, allowing replacement of an existing device with a new device without having to manually recreate the device links.
- PLC Replacement, allowing easy replacement of defective or upgraded PLC with automatic rebuilding of all devices that are linked to the PLC.
- Automatic restarting of the Smarthome Device Manager if it fails.
- Optimized device communications compared to the Smarthome Device Manager.

File: Insteon.dll **Device:** 262.

2. Installation

Run the Insteon Girder Plugin installer. During the installation, the latest version of the Smarthome Device Manager (SDM) will be downloaded and installed.

After running the installer, re-start Girder and open the Plugins Settings tab. Ensure that **Insteon** is ticked in the Plugin List. If you have already purchased a licence key for the plugin, highlight Insteon in the Plugins list, press the **Enter Registration Key** button and enter the name and key supplied to you. This button can also be used to link to Promixis to purchase a key. If you had to enable the plugin, shut down Girder and restart.

You should see the Smarthome Device Manager icon in the task-bar along with Girder.



3. INSTEON Overview

The INSTEON System

INSTEON is seen by its developers as a replacement for the aging but well-established X10 home automation network system which uses powerline signalling (signals are sent over existing mains electrical wiring). INSTEON is *dual band* sending the same messages over the powerline and by radio. Individual devices may use radio, powerline or both and all devices act as message relays meaning that the network becomes more robust and extends in range as new devices are added. All INSTEON messages are acknowledged and, if necessary retransmitted. Taken together these features make INSTEON much more robust and reliable than X10.

Interfacing with a PC

The PowerLinc V2 Controller (PLC) uses powerline signalling and is capable of interfacing both INSTEON and X10 devices to a PC. If the PC needs to interface with radio-only devices, then at least one dual-mode device such as the Signalinc RF will be required in addition.

INSTEON Devices

All INSTEON devices are shipped with a unique 24-bit ID which is expressed as three hexadecimal pairs, for example **A1.23.F0**. INSTEON devices can be thought of as *controllers* or *responders* and it is also possible for a device to serve both roles simultaneously. Controllers are sometimes referred to as *masters* and responders as *slaves*. Devices are controlled by linking a controller (such as the Controlinc V2 or PLC) to one or more responders (such as an ApplianceLinc V2 or SwitchLinc V2). The linking procedure is described in the documentation included with the INSTEON device. Links are stored in the memory of both the controller and responder. Contrast this with X10 where the addresses are assigned during installation (using the **house code** and **device code** switches) and you link two or more devices by giving them the same address.

Device Linking

Device linking is the critical part of the INSTEON network. A **controller** provides one or more **groups** containing potential **links** with responders. A group is a set of devices that respond together to a command from a controller. For example, the KeypadLinc V2 has 6 or 8 groups, one for each button. Each group has a list of **links**, allowing one controller to command several responders. A responder may be a member of many groups, allowing one responder to be commanded by several controllers (for example light switches at the top and bottom of the stairs commanding the same light dimmer). Each device can support up to 254 controller groups and the number of links in each group is limited only by memory.

The PowerLinc V2 interface is a full INSTEON controller and may have up to 254 groups defined in it. It sends and receives all messages between the INSTEON network and the PC.

Security

Security on an INSTEON network depends on confidentiality of the device IDs. For this reason, there is no automatic device discovery. You must have physical access to a device to discover its ID, either by reading it off a label or by pressing a button which readies the device for linking.

The PLC passes all messages it sees on the network to Girder, but it masks the ID of devices unless they have been linked to it. Messages can only be received by Girder from devices that have been linked to the PLC. However, Girder can auto discover devices in the INSTEON Network by examining the database of devices already linked to the PLC.

Commands

Standard responders include switches and dimmers and these respond to a set of standard messages. Dimmers use the concept of an **On Level** which is a programmable level that constitutes *On*. There is also a **Ramp Rate** which is the speed at which the brightness changes from one level to another. The responder has a *local* setting for each of these parameters and it also stores a version of each parameter with each link in its database (so it potentially has a different On Level and Ramp Rate for each controller group it is programmed to respond to). This feature allows INSTEON groups to implement powerful scene lighting sequences.

3. INSTEON Overview

The standard messages may be sent to a single device or to a Group.

On/Off: Transits from the current level to Off or to the On Level at the Ramp Rate.

Fast On/Fast Off: Sets the brightness instantly to Off or to the On Level.

Bright/Dim: Increases or reduces the brightness by one notch.

Start Bright/Start Dim/Stop Bright/Dim: Ramps the brightness at the Ramp Rate continuously to end of scale or until the Stop command is received.

The messages are implemented as two 8-bit numbers. Particular devices may implement additional messages, or entirely different messages.

Reference

For more details, see <http://www.insteon.net/>.

4. Configuration

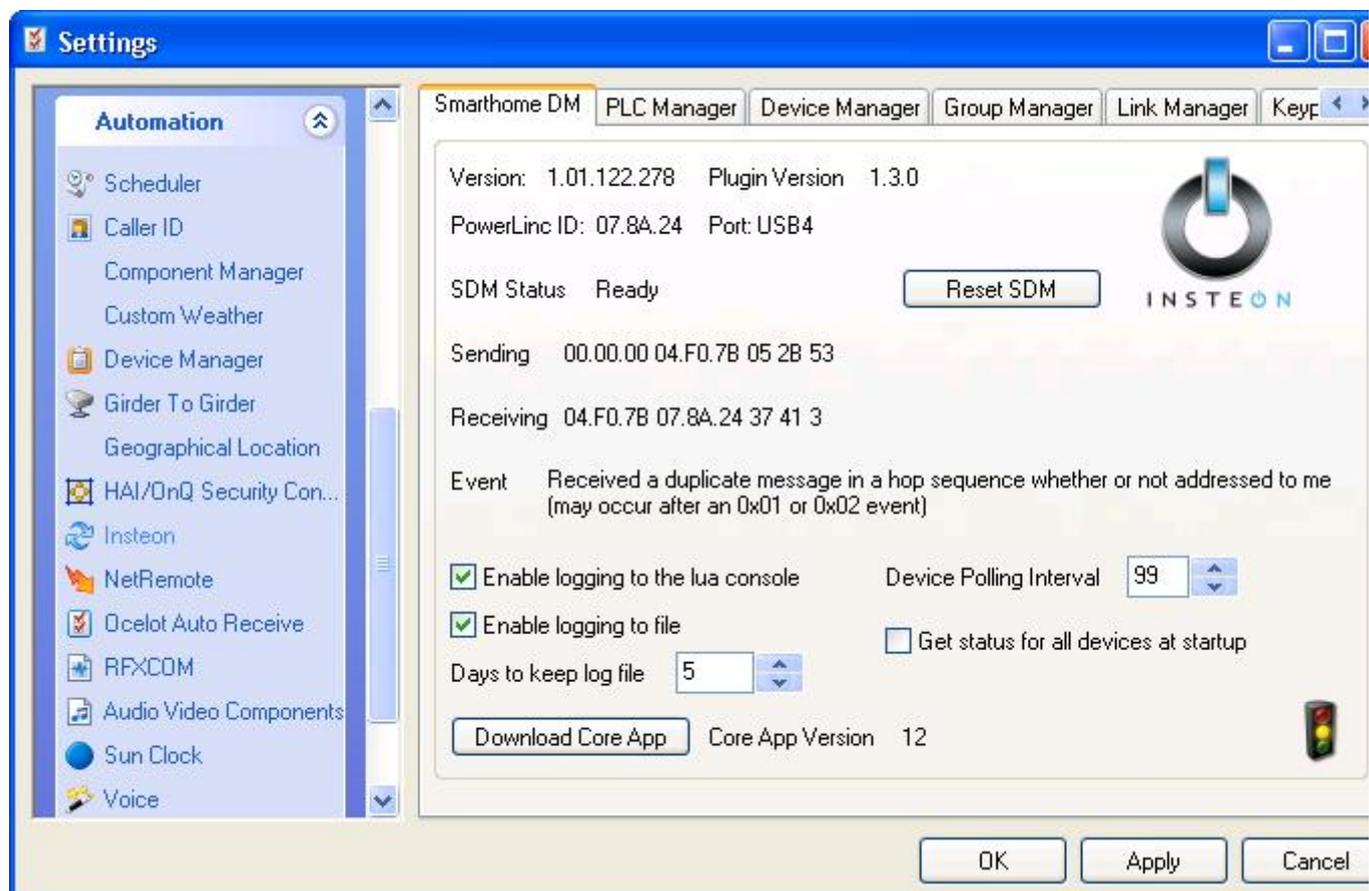
The configuration process provides Girder with information about the Devices, Groups and Links on the INSTEON network, associates meaningful names with INSTEON device IDs and configures the behavior of the devices. Once this has been done, the Insteon Girder Actions can be used in the GML file to respond to INSTEON and other Girder Events.

Contents

1. **Overview of Device Configuration**
2. **Message Monitoring**
3. **Smarthome DM Tab**
4. **PLC Manager Tab**
5. **Device Manager Tab**
6. **Group Manager Tab**
7. **Link Manager Tab**
8. **KeypadLinc Manager Tab**
9. **Copy/Replace Tab**
10. **Group Duplication Tab**

The Configuration Interface

To access the configuration interface, click **Insteon** in the **Automation** panel on the left of the Settings dialog.



4.1 Overview of Device Configuration

For Girder to monitor and control devices in your INSTEON Network, it must know their device ID. In order for Girder to discover the device ID, the device must be *linked* to the PLC. There are three methods of linking devices to the PLC, all of which require physical access to the device, for security reasons.

Directly from the PLC

Press and hold the **Set** button on the PLC for ten seconds. The light next to the **Set** button blinks when the PLC is in link mode. Next, press the **Set** button on the device to be linked for three seconds. The light attached to the device will flash to indicate a successful link. Girder will then detect the link and add the device to its list of known devices. Repeat this process for each device.

Using the PLC Link mode

On the **PLC Manager Tab**, click the **Start Link Mode** button. The PLC will now be in link mode for up to four minutes. On each device, press the **Set** button for three seconds to create the link to the PLC. The light attached to the device will flash to indicate a successful link.

Using the Device Manager

On the **Device Manager Tab**, click **Add** and type in the six digit device ID in the format **XX.XX.XX**. The device will then be added to the PLC link database and device information (on level, ramp rate, X10 address, model, and link database) will be retrieved. If the link database is large, this may take several minutes.

4.2 Message Monitoring

The Girder plugin uses a **Traffic Light Icon** to indicate message traffic between the PLC and other devices on the INSTEON network. From the INSTEON network viewpoint, the PLC, PC and Girder are all part of the same node.



A **green** light indicates that the PLC and Insteon Plugin are waiting and ready.

A **yellow** light indicates that the PLC and Insteon Plugin are busy communicating with a device.

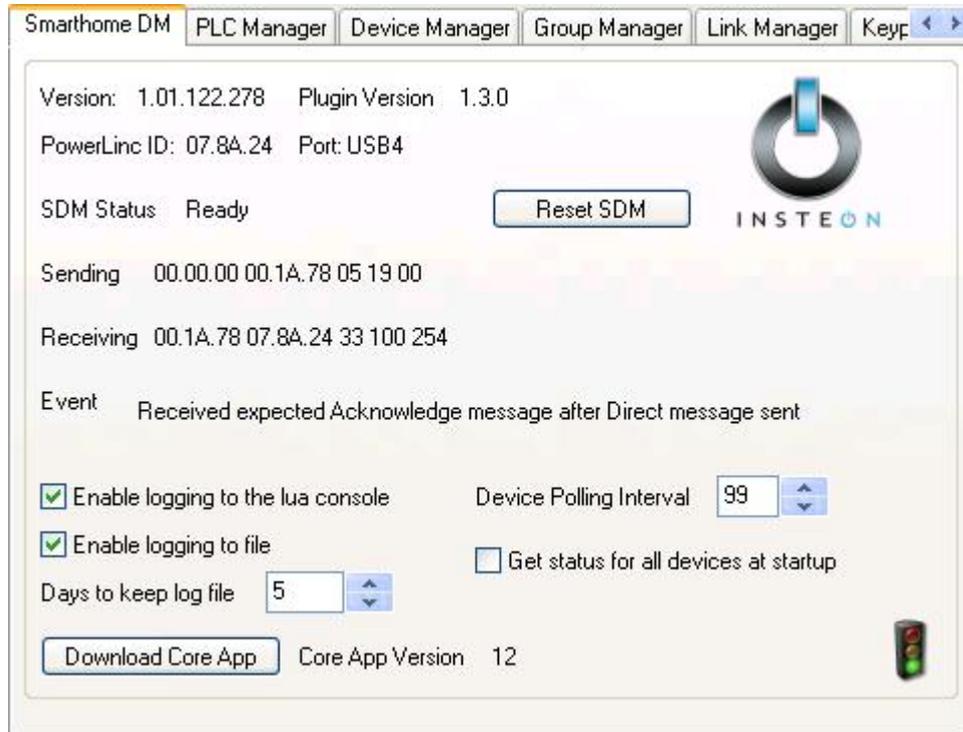
A **red** light indicates that there was an error communicating with a device or that there was an error with the Smarthome Device Manager software. Details of the error are shown in the Girder Log Window and in the Insteon Log file.

When adding a new device to Girder, there may be considerable INSTEON traffic while the plugin retrieves all information about a device. Also, when creating new links using the Group Manager and Link Manager, many messages will be sent between the PLC and the device. Each new link created between a device and PLC will take 30 to 60 seconds to create. During this time, the traffic light will be yellow.

To see the messages between the device and the PLC you can monitor the **Smarthome DM Tab**. For more detail, check **Enable logging to the Lua console**.

4.3 Smarthome DM Tab

The Smarthome DM tab shows status information about communications with the PLC and provides access to some general settings.



The **Version** of the Smarthome Device Manager (SDM) software is shown at the top of the page. Next the INSTEON device ID of the PLC is shown and the PC **Port** that it is connected to. The port used is controlled by the SDM software.

When the plugin is starting up, it will go through several stages as it retrieves information from the PLC. This may take a minute or more the first time the plugin is started depending on the size of the PLC link database. The start steps are shown in the **Status** area. After a minute or so, if **SDM Status** is not showing **Ready**, ensure that the PLC device is plugged in and connected to the PC. Right-click on the Smarthome Device Manager taskbar icon and ensure the **Set Port** menu item is set for the PC port the PLC is connected to.

The **Sending** and **Receiving** labels show the last commands sent and received by the PLC. The **Event** label shows the last INSTEON Event raised by the PLC. For more information on these commands, see the INSTEON SDK Manual.

Enable logging to the Lua console: If this is ticked, diagnostic information will be displayed on the Interactive Lua Console. This is only recommended for fault finding purposes.

Enable logging to file: Tick this to write diagnostic and logging information to a file. The file will be stored in **%GIRDER%Logs\Insteon*.log**.

Days to keep log file: The log files will be deleted after this number of days to conserve disk space. **0** means keep forever.

Device Polling Interval: Number of seconds the plugin waits to poll and check a device. To turn off polling, enter **0**.

Polling allows the plugin to monitor all devices it knows about – including status and link databases. In most instances, Girder can track the status of devices on the INSTEON Network in real time without polling. However, some devices (such as LampLinc modules) do not send any messages when their status changes. By polling, the plugin can monitor these devices and also devices link databases, updating them as needed.

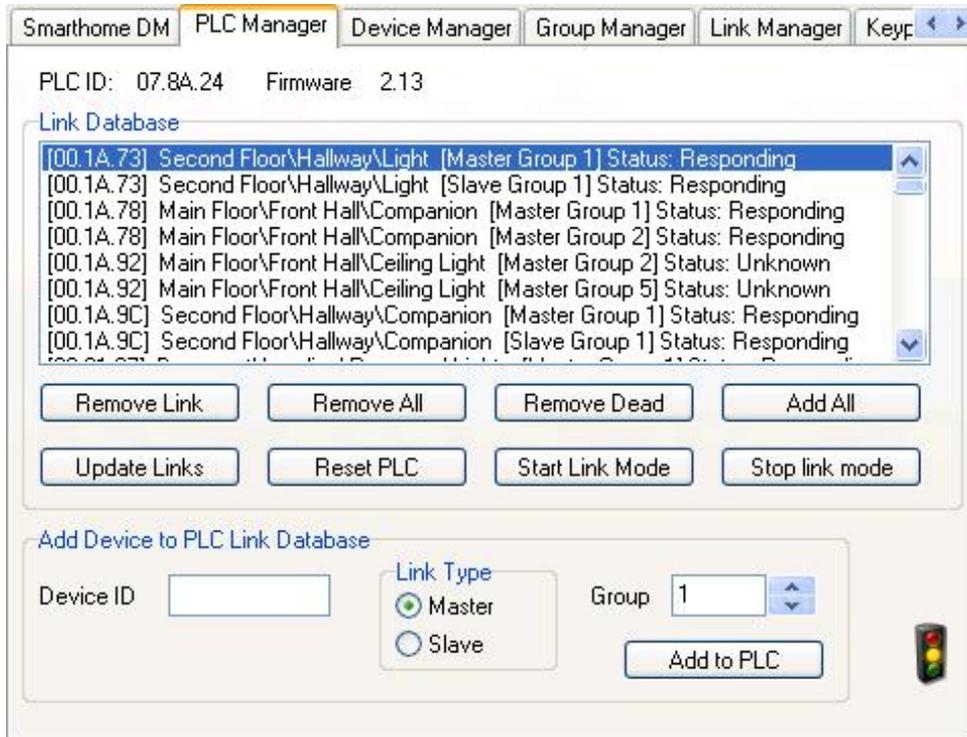
Get status for all devices at startup: Girder will automatically poll all devices for their status when it is started. This option may delay startup of Girder.

4. Configuration

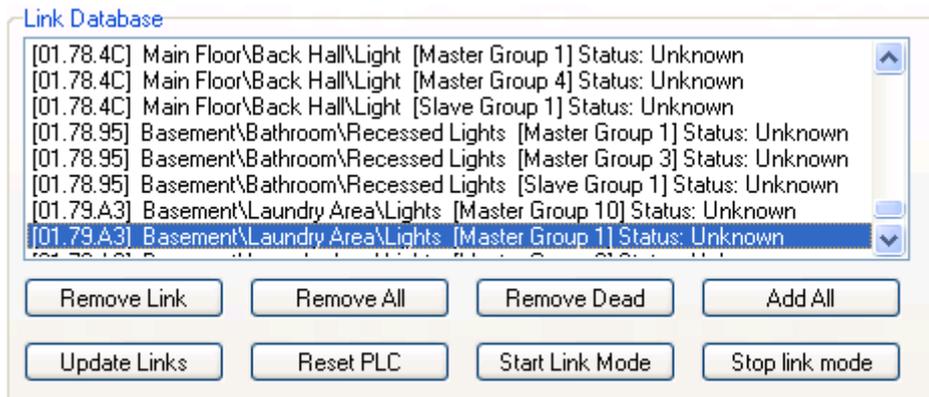
Download Core App: Press this button to update the Core Application running on the PLC. The Core Application Version is displayed next to this button. This must be 12 or greater. If the Core App Version is **Invalid** then press the Download Core App button and follow the download progress in the logger window. For the plugin to operate correctly, the core app must be loaded correctly. The plugin makes several attempts to download the core app and then fails. This is a known problem with SDM.

4.4 PLC Manager Tab

The PLC Manager tab provides management features for the link database stored in the PLC. At the top of the page, the PLC INSTEON device ID is shown as well as its firmware version number.



The **Link Database** list shows all links in the PLC database.

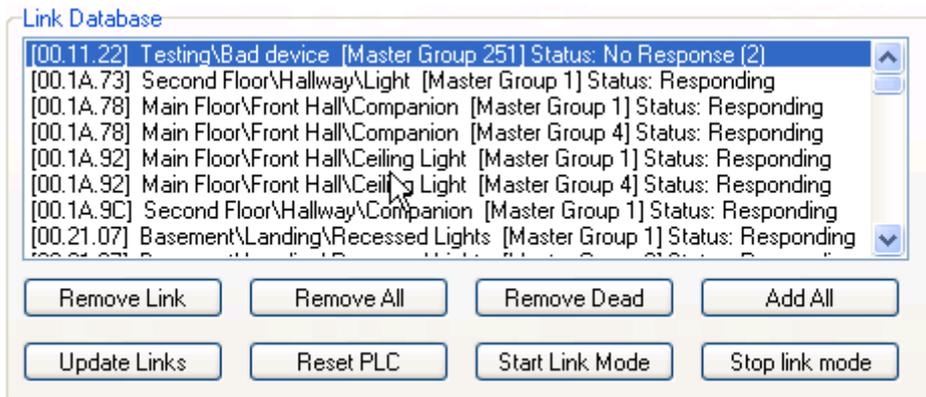


4. Configuration

The device ID is shown between the square brackets. Next, the device name (once one has been set using the **Device Manager Tab**) is shown. Next, in square brackets, is the link type and group number. Finally, the status of the device is shown. Initially the status of all devices is shown as **Unknown**. When Girder sees a message from a device the status is changed to **Responding** as shown below.



If a device fails to respond to a message, the Link Database shows **No Response** followed by the number of messages the device has failed to respond to in brackets.



Remove Link: Removes the selected link from the database.

Remove All: Clears all entries from the link database.

Remove Dead: Remove all links whose device status is **No Response**.

Add All: Adds links from all devices on the Device Manager tab to the PLC. Only use when instructed by Promixis technical support.

Update Links: Updates the Device Links list from the PLC.

Start Link Mode: Places the PLC into Link Mode for up to 4 minutes. Devices can then be linked to the PLC by pressing their set button for 3 seconds.

Stop Link Mode: Takes the PLC out of Link Mode.

Add to PLC: Allows a device to be added to the PLC database manually. Specify the Device ID in **AA.AA.AA** format, whether the link should be Master (Controller) or Slave (Responder) finally the Group number. Using this command is generally not required and should be only used in instances where other methods of linking a device fail.



4.5 Device Manager Tab

The Device Manager tab is used to manage INSTEON devices linked to the PLC.

Device ID: 00.1A.92 Model: SwitchLinc Dimmer 600W 100%

Loc\Name: Main Floor\Front Hall\Ceiling Light

Description:

X10 Address: M9 Firmware: 34

On Level: 100 Ramp Rate: 0.5 sec

Last Command: 00.00.00 5 43 48 Response: 07.8A.24 33 43 0

Links: [121] 08.10.2006/05:43:18 Communication Reliability: 100%

[1] 00.1A.78 Master Group 1 OL:4 RR:4 D:0	<input type="button" value="Update Links"/>
[2] 07.8A.24 Slave Group 2 OL:255 RR:31 D:0	<input type="button" value="Remove Link"/>
[3] 00.1A.78 Slave Group 1 OL:254 RR:31 D:0	<input type="button" value="Link to PLC"/>
[4] 07.8A.24 Slave Group 4 OL:254 RR:31 D:0	

Device ID: You can pick an existing device by selecting the device from the drop down box.

Loc\Name: You can pick an existing device by location and name.

X10: Shows the **X10 Address** of the device (**Not Set** in this instance). This allows a legacy **X10** device to be controlled by Girder through the PLC.

Firmware: Shows the device firmware version.

On Level: Shows the local On Level of the device.

Ramp Rate: Shows the local Ramp Rate of the device.

Last Command/Response: Shows recent communication with the device. The details of these messages are in the INSTEON SDK Manual.

Links: Shows the number of links in the database of the device and the date and time this information was last updated. The number in square brackets is the **Link Delta**.

Communication Reliability: Shows the percentage of all commands that have been successful.

4. Configuration

Adding A Device

Press **Add** to add a new device to the Device Manager.

The screenshot shows the 'Device Manager' tab in a software interface. At the top, there are navigation tabs: 'Smarthome DM', 'PLC Manager', 'Device Manager' (selected), 'Group Manager', 'Link Manager', and 'Key'. Below the tabs, the device configuration is displayed. The 'Device ID' is '00.1A.92', 'Model' is 'SwitchLinc Dimmer 600w', and '100%' is shown with a lightbulb icon. The 'Loc\Name' is 'Main Floor\Front Hall\Ceiling Light'. There are buttons for 'Print', 'Flash Device', and 'Update Device'. The 'X10 Address' is 'M9', 'Firmware' is '34'. 'On Level' is '100', 'Ramp Rate' is '0.5 sec'. 'Last Command' is '00.00.00 5 43 48', 'Response' is '07.8A.24 33 43 0'. 'Links' are listed as '[121] 08.10.2006/05:43:18 Communication Reliability 100%'. A list of links is shown: '[1] 00.1A.78 Master Group 1 OL:4 RR:4 D:0', '[2] 07.8A.24 Slave Group 2 OL:255 RR:31 D:0', '[3] 00.1A.78 Slave Group 1 OL:254 RR:31 D:0', and '[4] 07.8A.24 Slave Group 4 OL:254 RR:31 D:0'. Buttons for 'Update Links', 'Remove Link', and 'Link to PLC' are present. At the bottom, there are 'Add', 'Edit', and 'Delete' buttons, and a traffic light icon.

You must know the device's 6 digit ID. The ID is entered in the format of **XX.XX.XX**. Also enter the device **Location** and **Name**. A device **Description** can also optionally be entered. Press **Ok** when finished.

Girder will then try to retrieve information about the device and all of its links. Depending on the size of the device's link database, this may take several minutes. The Traffic Light will be yellow while getting device information and the Links label will display **Adding Links**. Links are updated in the list as they are retrieved.

Working with Devices

Edit: Change the **description**, **location** and **name** for an existing device by pressing the **Edit** button and then over-typing the changed information. Press **Ok** to commit the changes.

Print: Prints the settings for the selected device to the Lua Interactive Console for debugging purposes.

Flash Device: Causes the device to flash on and off to assist in finding it in "the real world" and confirm that Girder is communicating with it.

Update Device: Updates the Model, X10 Address, Firmware, On Level and Ramp Rate information for the selected device.

Update Links: Press this button to read the link information from the device database.

Remove Link: Removes the selected link from the device database.

Link to PLC: Links the device to the PLC as a Controller. This ensures the PLC can see messages from the device and can track its status. For devices that are responders only (ie. the LampLinc V2), there are no messages to indicate its state has changed if the local load (light) has been changed. Girder can track responder devices in real time if they are controlled by INSTEON Controllers (ie a ControlLinc, SwitchLinc or the PLC).

Delete: Delete the selected device from Girder's device database.

Troubleshooting

If there are problems communicating with a device, the Device Manager tab will show a red **No Response** message with a number in brackets indicating the number of consecutive failures.

4. Configuration

Check that the Device ID has been entered correctly and that the device is plugged in and/or switched on. If there is still no response, try temporarily moving the device to a socket closer to the PLC or close to the transponder antenna for radio devices. If this succeeds, you may need to install a SignalLink device to extend the range of the INSTEON network.

4.6 Group Manager Tab

The Group Manager is used to create and modify groups on any INSTEON Controller including the PLC, SwitchLinc, KeypadLinc and ControlLinc.

The screenshot shows the Group Manager interface. At the top, there are tabs for 'Smarthome DM', 'PLC Manager', 'Device Manager', 'Group Manager', 'Link Manager', and 'Keyp'. The 'Group Manager' tab is active. Below the tabs, there are four dropdown menus: 'Device ID' (01.08.47), 'Loc\Name' (Basement\Theater\Control), 'Group Number' (3), and 'Group Name' (Medium). An 'Edit' button is located below these fields. A 'Group Links' list is shown, containing five entries: 'Basement\Landing\Recessed Lights [00.21.07]', 'Basement\Play Area\Control [04.EB.DC]' (highlighted), 'Basement\Play Area\Recessed Lights [00.25.97]', 'Basement\Play Area\Spot Lights [00.25.8D]', and 'Basement\Theater\Lights [00.25.AC]'. To the right of the list are three fields: 'On Level' (100), 'Ramp Rate' (0.1 sec), and 'Keypad #' (3). A note at the bottom reads: 'NOTE: It may take upto 2 minutes to add a new or upto 30 seconds to change an existing link.' At the bottom of the interface are three buttons: 'Add', 'Edit', and 'Delete'.

The PLC can be the controller of up to 254 groups. SwitchLinc devices are controller for one fixed group. KeypadLincs are controller of 6 or 8 fixed groups depending on the model. ControlLincs can be the controller of up to 5 groups.

The Group Manager allows naming of the Groups that exist on any controller device.

Groups are managed by selecting the controller (master) device using the **Device ID** or the **Loc\Name** drop down boxes. The Group to be edited within this controller is then selected using the **Group Number** or **Group Name** drop down boxes.

Edit: Press the upper **Edit** button to change the name of a Group.

Group Links: The **Group Links** list shows the devices linked as responders in the selected controller Group.

On Level: For dimmer type devices, this selects the brightness that will be set by an **on** command. A different On Level can be set for each responder in the Group. This overrides the local On Level for commands sent to this Group, a useful feature for defining lighting scenes.

Ramp Rate: For dimmer type devices, this selects the speed at which the brightness will change from one level to another. The time is the time it would take to transit from 0 to 100% or vice versa. A different Ramp Rate can be set for each responder in the Group, and this overrides the local Ramp Rate as with On Level above.

Keypad #: Controls which button on a KeypadLinc device is lit when a group command is sent to the device. Use 1 for the local load group or 2 to 8 for one of the other buttons.

4. Configuration

Add: Press **Add** and then select the device to be added to the Group. Select the desired **On Level** and **Ramp Rate** for the device. It may take a minute or so for Girder to create the links between the Controller Device and the Slave Device.

The 'Add' configuration dialog box is shown. It features a title bar with a traffic light icon. The main area contains several fields: 'Device ID' (00.D7.6D), 'Loc\Name' (Insteon\PowerLinc), 'Group Number' (10), and 'Group Name' (Basement All). Below these is an 'Edit' button. The 'Group Links' section has a 'Select Device' dropdown menu with 'Basement\Landing\Recessed Lights' selected. To the right of this dropdown are 'On Level' (100) and 'Ramp Rate' (0.1 sec) controls. A note at the bottom states: 'NOTE: It may take upto 2 minutes to add a new or upto 30 seconds to change an existing link.' At the very bottom are 'Ok' and 'Cancel' buttons.

Press **Ok** to add the link.

Edit: Press **Edit** to change the On Level and/or Ramp Rate of the link.

The 'Edit' configuration dialog box is shown. It has the same layout as the 'Add' dialog, but the 'Edit' button is highlighted. The 'Group Links' section now displays a list of devices: 'Basement\Bathroom\Exhaust Fan [00.CC.4E]', 'Basement\Laundry Area\Lights [01.79.A3]', 'Basement\Play Area\Recessed Lights [00.25.97]', 'Basement\Storage Room\Lights [01.45.38]', 'Basement\Theater\Recessed Lights [00.25.AC]', 'Basement\Theater\Sconces [01.08.47]', and 'Basement\Top of Stairs\Master [00.25.8D]'. The 'On Level' and 'Ramp Rate' controls are now enabled and show values of 100 and 0.1 sec respectively. The note and buttons at the bottom are identical to the 'Add' dialog.

After pressing **Edit**, the **On Level** and **Ramp Rate** controls are enabled. Change the On Level and Ramp Rates to the desired settings. Click **Ok** to have the changes made. Note: each change may require several seconds to be performed.

Delete: Press Delete to delete the selected responder device from Group.

4. Configuration

Example

Below is an example of a Group between two SwitchLinc devices. They are configured in a companion mode (one device controls the load directly and the other device is used as a remote switch). To keep both switches in sync, each device is configured as a controller of the other device.

Device ID: 00.1A.92 Loc\Name: Main Floor\Front Hall\Ceiling Light

Group Number: 1 Group Name: Group 1

Edit

Group Links:

- Main Floor\Front Hall\Companion [00.1A.78]

On Level: 100

Ramp Rate: 0.1 sec

NOTE: It may take upto 2 minutes to add a new or upto 30 seconds to change an existing link.

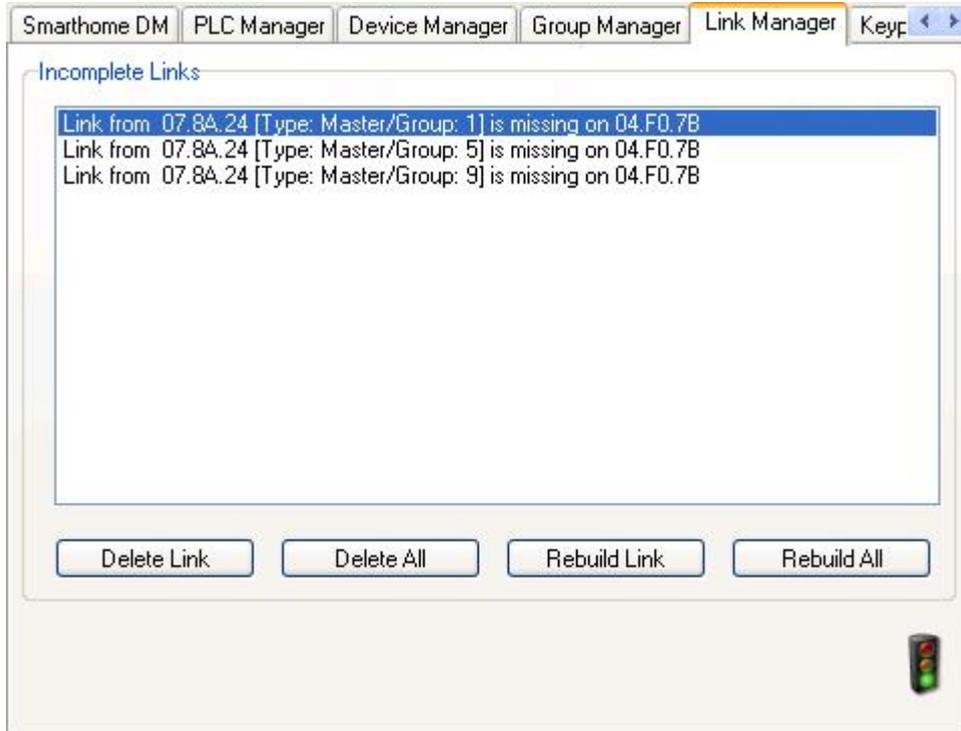
Add Edit Delete

We see the link from the device controlling the load to the device containing the companion switch. This link is used to keep the companion switch in sync with the load switch. A second link (not shown) exists in which the controller is the companion switch and the responder is the load switch. This allows the companion switch to also control the light.

Links set up this way are autonomous and they will function without Girder or the PLC being active.

4.7 Link Manager Tab

The Link Manager shows a list of all incomplete links of devices on the INSTEON Network that Girder knows about. Incomplete links can decrease performance of the Network. Use the Link Manager to rebuild or delete these links.



Delete Link/Delete All: Deletes the selected link or all incomplete links. Use these commands to remove devices that are no longer part of the Network.

Rebuild Link/Rebuild All: Use this command to have missing links added to devices as needed.

NOTE: It is important that Girder's database of device links is up to date. Girder tracks device links during its normal polling of devices. However devices that have been recently linked manually (not using Girder) will not be immediately recognized by Girder. In this case, update the device links from the Device Manager tab.

When modifying the links of many devices, it may take a long time for the commands to be executed. You can monitor this by watching the INSTEON Traffic icon or using the **Smarthome DM Tab**.

4.8 KeypadLinc Manager Tab

The KeypadLinc Manager Tab provides configuration operations for the advanced features of KeypadLinc devices.

In this topic, references to the **on** command include the **bright** and **fast on** commands. Similarly, **off** includes **dim** and **fast off**.

The KeypadLinc device provides a single dimmer unit and six or eight pushbuttons each with a controllable indicator. In six-button mode two of the buttons (the large on and off buttons at the top and bottom of the KeypadLinc) control the local dimmer while in eight-button mode, one button (button 1, top left hand button of the KeypadLinc) controls the local dimmer in toggle (the default) or non toggle mode. Button 1 can be changed to a non toggle mode **on** button for the local load and another button, say button 2, can be configured as the **off** button for the local load by setting button 1 in the On Mask (see later) for button 2.

All the buttons have INSTEON controller groups which may be linked to other devices using the **Link Manager Tab** in the usual way. By default, secondary buttons operate in *toggle* mode whereby a single button generates **on** or **off** commands on alternate presses with the indicator showing the current state. Secondary buttons can be configured to generate either **on** or **off** commands with toggle mode off. Buttons can then be used in pairs, similar to the six-button control for the local load, or in larger groups for setting lighting scenes. With toggle mode off, the secondary button indicators will not function unless specifically programmed.

This tab provides an easier way to remotely program KeypadLinc devices compared to the complex plug-and-tap methods detailed in the device manual.

The screenshot shows the KeypadLinc Manager configuration window. The window has tabs for PLC Manager, Device Manager, Group Manager, Link Manager, and KeypadLinc Manager. The KeypadLinc Manager tab is active, showing 'Button Configuration' for ID 01.08.47 at location Basement\Theater\Control. It features sections for 'Edit Button' (radio buttons 1-8), 'Toggle' (radio buttons Off and On), 'On Mask' (checkboxes for Button 1-8), and 'Off Mask' (checkboxes for Button 1-8). A 'Link button to PLC Group' dropdown is set to 1. Buttons are: 1 (radio), 3 (radio), 4 (radio), 5 (radio), 6 (radio), 8 (radio). On Mask: 1 (checked), 2 (unchecked), 3 (checked), 4 (unchecked), 5 (unchecked), 6 (unchecked), 7 (unchecked), 8 (unchecked). Off Mask: 1 (unchecked), 2 (checked), 3 (unchecked), 4 (checked), 5 (checked), 6 (checked), 7 (checked), 8 (checked). Buttons 6 and 8 are selected in the 'Buttons' section at the bottom left. Buttons are: 6 (radio), 8 (radio). Buttons: Update, Link, Apply.

ID: Select the KeypadLinc by ID.

Location/Name: Select the KeypadLinc by name and location.

Update: Press this button to ensure the tab reflects the current state of the device (this is usually automatic).

Buttons: Select six-button or eight-button mode. The tab changes slightly to reflect your choice.

In six-button mode, shown above, the large buttons at the top and bottom are respectively **Button 1**, local dimmer **on**, and **Button 8**, local dimmer **off**. Buttons 3 to 6 are available for linking and are the four smaller buttons in the middle (numbered left-to-right, top-to-bottom). Buttons 2 and 7 are not available.

4. Configuration

In eight-button mode, shown below, **Button 1** (top left) controls the local lamp dimmer and each of the other seven buttons (numbered left-to-right, top-to-bottom) generates commands to its own controller group.

The local dimmer can also be controlled remotely or by programming a link into the controller group of any of the other buttons (however you cannot link buttons to give different brightness levels for the local load, a limitation of the KeypadLinc device).

You program links into the available controller groups using the **Link Manager Tab**.

The screenshot shows the 'KeypadLinc Manager' software interface. The 'Button Configuration' window is active, displaying settings for button ID 01.08.48 at the location 'Main Floor\Kitchen\Undercabinet Lights'. The interface includes several sections: 'Edit Button' with radio buttons for buttons 1 through 8 (button 1 is selected); 'Toggle' with radio buttons for 'Off' and 'On' (the 'On' option is selected); 'On Mask' with checkboxes for 'Button 1' through 'Button 8' (all are checked); and 'Off Mask' with checkboxes for 'Button 1' through 'Button 8' (all are checked). There are 'Update', 'Link', and 'Apply' buttons. A 'Link button to PLC Group' dropdown menu is set to '1'. A 'Buttons' section at the bottom left shows radio buttons for buttons 6 and 8 (button 8 is selected).

Edit Button: Select the button to be programmed. The Toggle Mode and Masks settings apply to this button.

Toggle: Select **On** to make the button selected in the Edit Button list generate **on** and **off** commands on alternate presses. To turn Toggle Mode off for the selected button, first ensure the button indicator shows the state you want the button to generate, then change the mode to **off** and press **Apply**. To change the state of a button which is currently in Toggle Mode remotely, you can temporarily link it to a controller group and it will then follow the state of that group (but it is probably easier to just press the button on the device). If the indicator was lit prior to changing the mode, the button will generate **on** after the mode change, otherwise it will generate **off**.

On Mask: Any buttons checked here will have their indicators turned on when the button selected in the Edit Button list is pressed (with Toggle Mode off). Selecting button 1 in this mask will also result in the selected button controlling the local load in addition to any links in its group.

Off Mask: Any buttons checked here will have their indicators turned off when the button selected in the Edit Button list is pressed (with Toggle Mode off).

The Mask feature is useful when you use two buttons with Toggle Mode off to switch a device on and off. Each button should be masked to switch its own indicator on and the opposite indicator off. Similarly if a group of buttons are used to select different lighting scenes, each button could be masked to switch its own indicator on and all the other indicators for buttons in the group off.

Apply: Press this button to update the masks and toggle mode for the button selected in the Edit Button list.

Link button to PLC Group: Select the group number in the PLC to link the button selected in the Edit Button list to. Press the **Link** button to make the link. This is useful for remotely controlling the state of the button when switching Toggle Mode off.

NOTE: There are many different combinations of button modes and button masking that can be configured. The exact behavior of all these combinations is impossible to detail here and has not

4. Configuration

always been clearly defined by the Smarthome technical documents. Furthermore, the behavior of the KeypadLincs seems to vary slightly depending on the firmware version. To get the exact results you are looking for will require some trial and error. Please post any questions on the Promixis forums.

4.9 Copy/Replace Tab

The options available on the Copy/Replace Tab facilitate the replacement or removal of devices in the Insteon Network.

The screenshot shows the 'Copy/Replace' tab in a software interface. It contains three main sections:

- Copy or Replace existing device links:** This section has two dropdown menus for 'Source Device' (set to '!TEST\CONTROLLINC [00.6E.C4]') and 'New Device' (set to '!test\LAMPLINC [01.6B.19]'). Below these are two radio buttons under the heading 'Mode': 'Replace source device' (which is selected) and 'Copy source device'. To the right of these buttons is a text box that reads: 'Copying/replacing device links takes 15-30 seconds per link. Turn on lua console logging to follow progress.' At the bottom of this section is an 'Execute' button.
- Replace PLC:** This section has a text input field labeled 'Enter old PLC device ID' and an 'Execute' button.
- Delete all references to a device:** This section has a text input field labeled 'Enter ID of device to remove' and an 'Execute' button.

Copy or Replace existing device links

Source Device: Select the device to be replaced or duplicated.

New Device: Select the device to become the replacement or duplicate of the Source Device.

Replace source device: Select this option to replace all references to the Source Device with references to the New Device.

Copy source device: Select this option to duplicate all links on the Source Device in the New Device.

Execute: Press this button to implement the selected operation. This can take a considerable time depending on the number of links.

Replace PLC

To replace a PLC (for example, one that has failed) with a new one, close Girder down, remove the old PLC and connect the new one. Restart Girder, enter the **old ID** and press the **Execute** button.

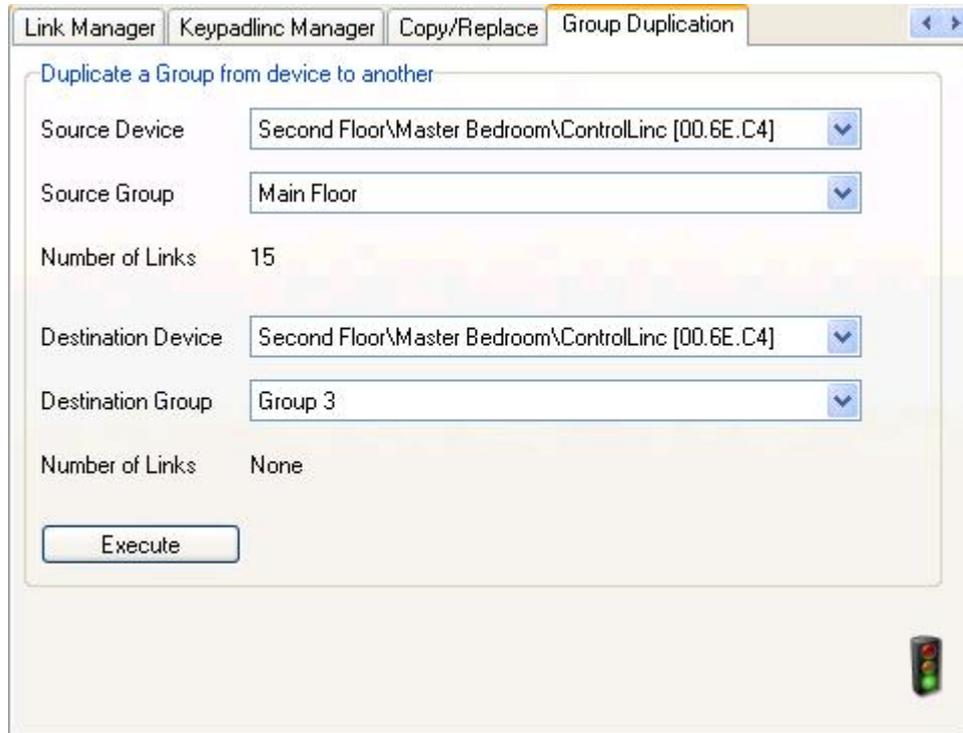
Enter old PLC device ID: This is the ID of the original PLC that has now been replaced. When the **Execute** button is pressed, all references to this device will be replaced with references to the current PLC. Note that this operation can take a considerable time.

Delete all references to a device

Enter ID of device to remove: Enter the ID of a device to remove. When **Execute** is pressed all links in all devices referencing the specified device will be deleted.

4.10 Group Duplication Tab

The Group Duplication Tab is used to copy a group created on a device to another device or to duplicate it on the same device (for devices like ControlLinc or KeypadLinc which support more than one group).



The screenshot shows a software window titled "Group Duplication" with several tabs: "Link Manager", "Keypadlinc Manager", "Copy/Replace", and "Group Duplication". The "Group Duplication" tab is active and contains the following fields and controls:

- Duplicate a Group from device to another** (header)
- Source Device:** A dropdown menu showing "Second Floor\Master Bedroom\ControlLinc [00.6E.C4]".
- Source Group:** A dropdown menu showing "Main Floor".
- Number of Links:** A text field showing "15".
- Destination Device:** A dropdown menu showing "Second Floor\Master Bedroom\ControlLinc [00.6E.C4]".
- Destination Group:** A dropdown menu showing "Group 3".
- Number of Links:** A text field showing "None".
- Execute:** A button at the bottom left.
- A small traffic light icon is visible in the bottom right corner of the window.

Source Device: Select the device to copy from. Only devices which can act as a controller and which are already configured as a controller for at least one other device are listed.

Source Group: Select the group on the source device to be copied. Only source groups which are not empty are listed.

Number of Links: Shows the number of links in the selected source group.

Destination Device: Select the device to receive the copied group. This can be the same as the source to duplicate the group.

Destination Group: Select the group on the destination device to receive the copy. If this group already has links, the links from the source group will be added to these. If you want to remove old links from the destination group, use the **Group Manager Tab**.

Number of Links: Shows the number of links in the destination group. This will increment to show the progress of the operation.

Execute: Press this button to implement the selected copy. Allow 30-60 seconds per link.

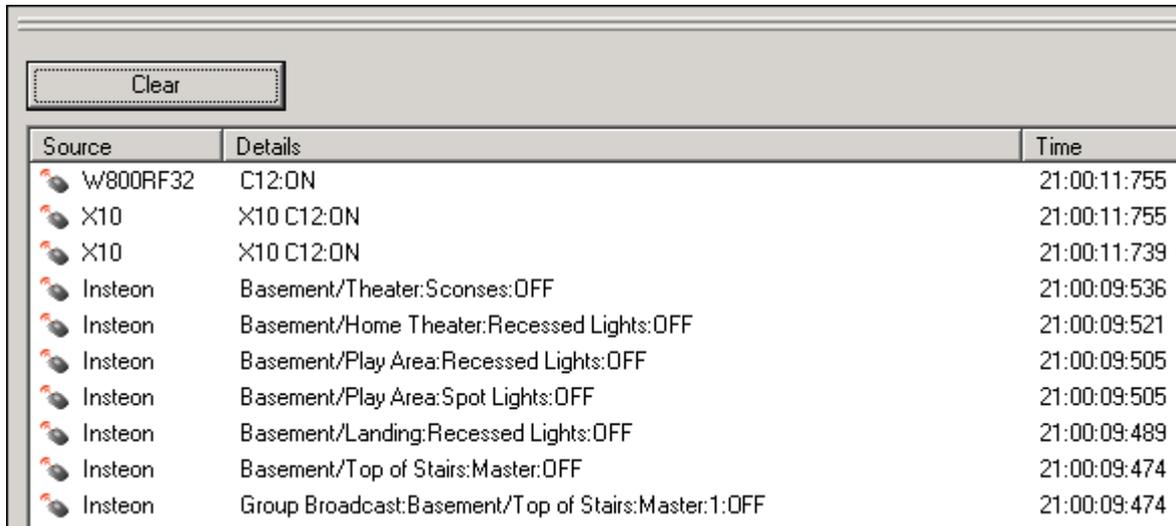
5. Event Reference

The Plugin raises Girder Events for controller commands seen on the INSTEON network. When possible, the ID is translated using name and location information held in the Girder database.

Girder will generate events for all devices it knows about. When a device state changes, it is immediately updated and an event is raised. Girder can also track the status of devices that are members of a group. Girder does this by monitoring commands from controllers and then generating events for all devices in that controller group. This requires that the Girder device link database is up to date.

Girder can also track devices and members of a group changed by using local dim and bright features. This is done by monitoring the timing between the INSTEON **Dim** and **Bright** commands. Events generated by these commands make guestimates of the ending level of the device. Girder will then immediately poll devices changed using local dim/bright commands to determine their exact level.

The following screenshot shows INSTEON Events in the Girder Event Logger. Events can be dragged from the logger and attached to an action in the Girder Tree.

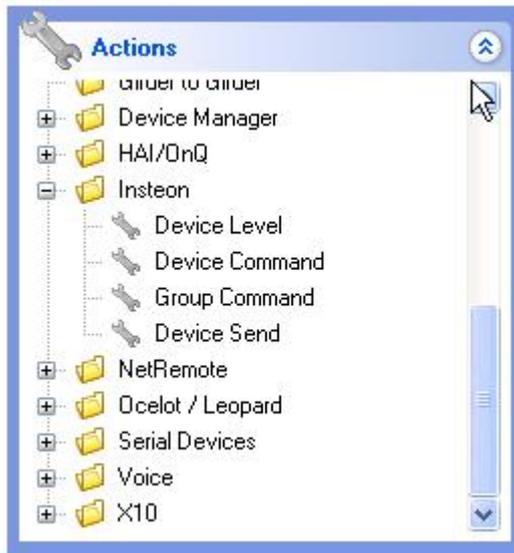


The screenshot shows a window titled 'Girder Event Logger'. At the top left is a 'Clear' button. Below it is a table with three columns: 'Source', 'Details', and 'Time'. The table contains ten rows of event data, each starting with a small red and black icon representing a device or location.

Source	Details	Time
W800RF32	C12:ON	21:00:11:755
X10	X10 C12:ON	21:00:11:755
X10	X10 C12:ON	21:00:11:739
Insteon	Basement/Theater:Sconces:OFF	21:00:09:536
Insteon	Basement/Home Theater:Recessed Lights:OFF	21:00:09:521
Insteon	Basement/Play Area:Recessed Lights:OFF	21:00:09:505
Insteon	Basement/Play Area:Spot Lights:OFF	21:00:09:505
Insteon	Basement/Landing:Recessed Lights:OFF	21:00:09:489
Insteon	Basement/Top of Stairs:Master:OFF	21:00:09:474
Insteon	Group Broadcast:Basement/Top of Stairs:Master:1:OFF	21:00:09:474

6. Action Reference

Once the INSTEON network is configured in Girder, Girder Actions can be used to command the devices.

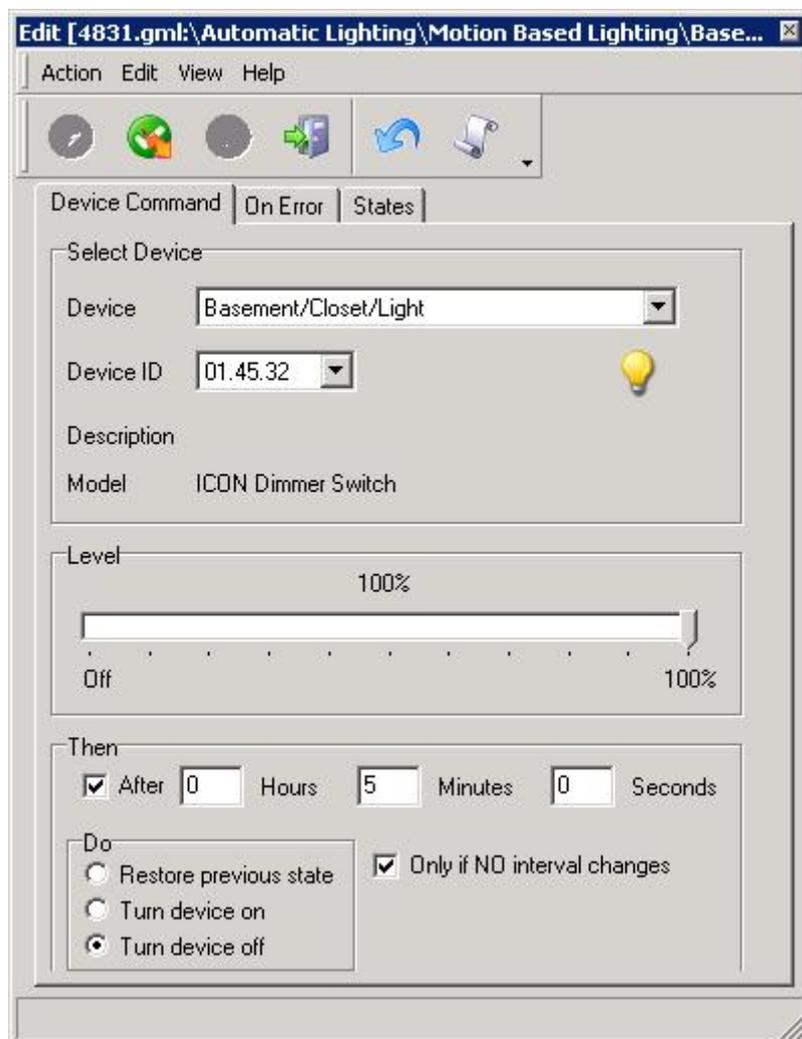


1. **Device Level**
2. **Device Command**
3. **Group Command**
4. **Device Send**

6.1 Device Level

Device Level | On Error | States

The Device Level Action commands an INSTEON device to switch on or off or, if it is a dimmer type device, to set a particular level.



Device: If the device has been named, use this drop-down to select it.

Device ID: For unnamed devices, use this drop-down to select the device by INSTEON ID (the ID should be identified on a label on the device).

Level: Use the slider to select the level to set the device to. For switch devices use the **Off** or **100%** setting.

Then: Tick the box top left of this pane to schedule a follow-up action after an interval of time.

Hours, Minutes, Seconds: Select the delay before follow-up action is taken.

Do: Select the action to be taken once the follow-up delay expires.

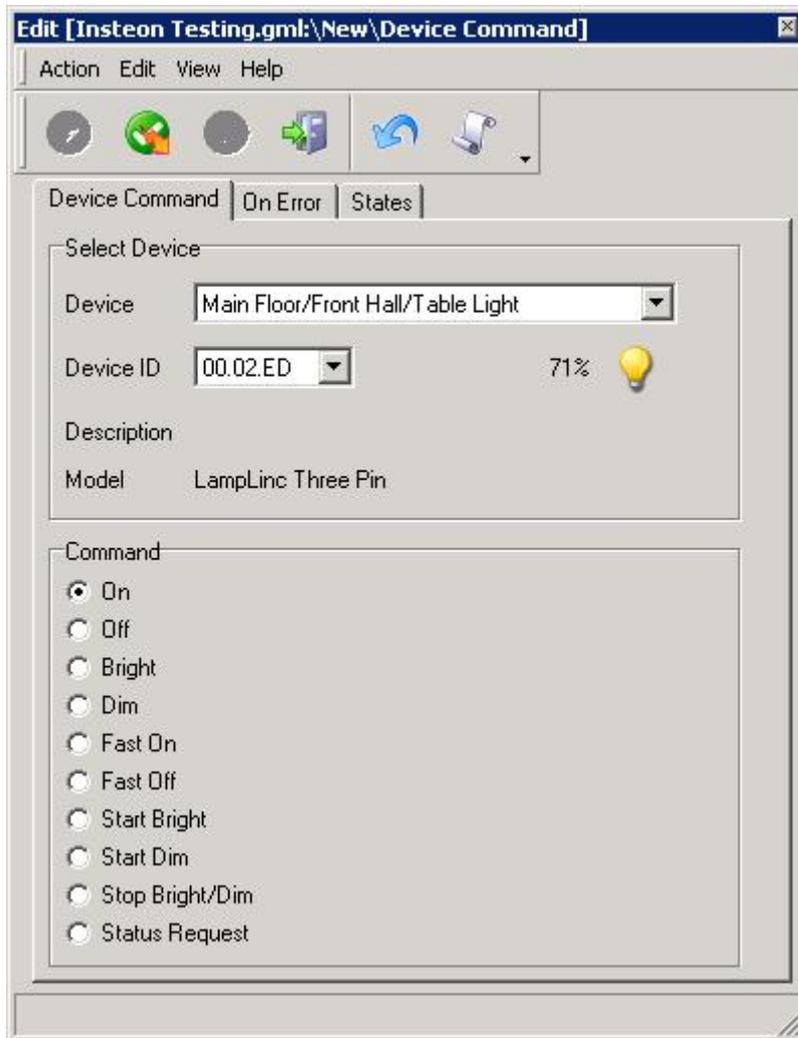
Only if NO interval changes: If this box is ticked, any other commands issued to this device (including from other INSTEON controllers on the network) will cancel the follow-up action.

Source: Insteon Plugin.

6.2 Device Command

Device Command | On Error | States

The Device Command Action sends a standard command to a selected INSTEON device.



Device: If the device has been named, use this drop-down to select it.

Device ID: For unnamed devices, use this drop-down to select the device by INSTEON ID (the ID should be identified on a label on the device).

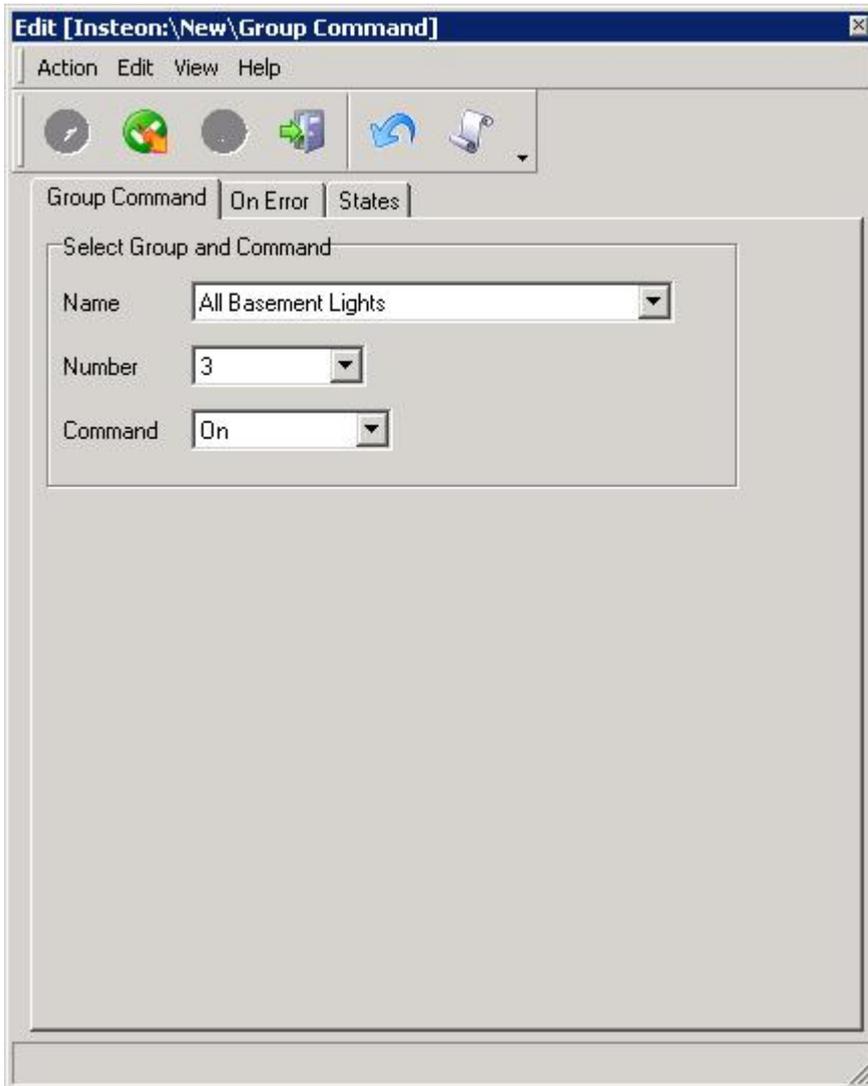
Command: Select the command to send to the device.

Source: Insteon Plugin.

6.3 Group Command

Group Command | On Error | States

The Group Command Action sends a command to one of the Groups of INSTEON devices defined in the PLC. All the devices in the group see the command simultaneously allowing coordinated changes, for example to lighting level. A Group must be defined before it can be used: see [Group Manager Tab](#).



Name: Use this drop-down to select the PLC Master Group by name.

Number: Use this drop-down to select the PLC Master Group by number.

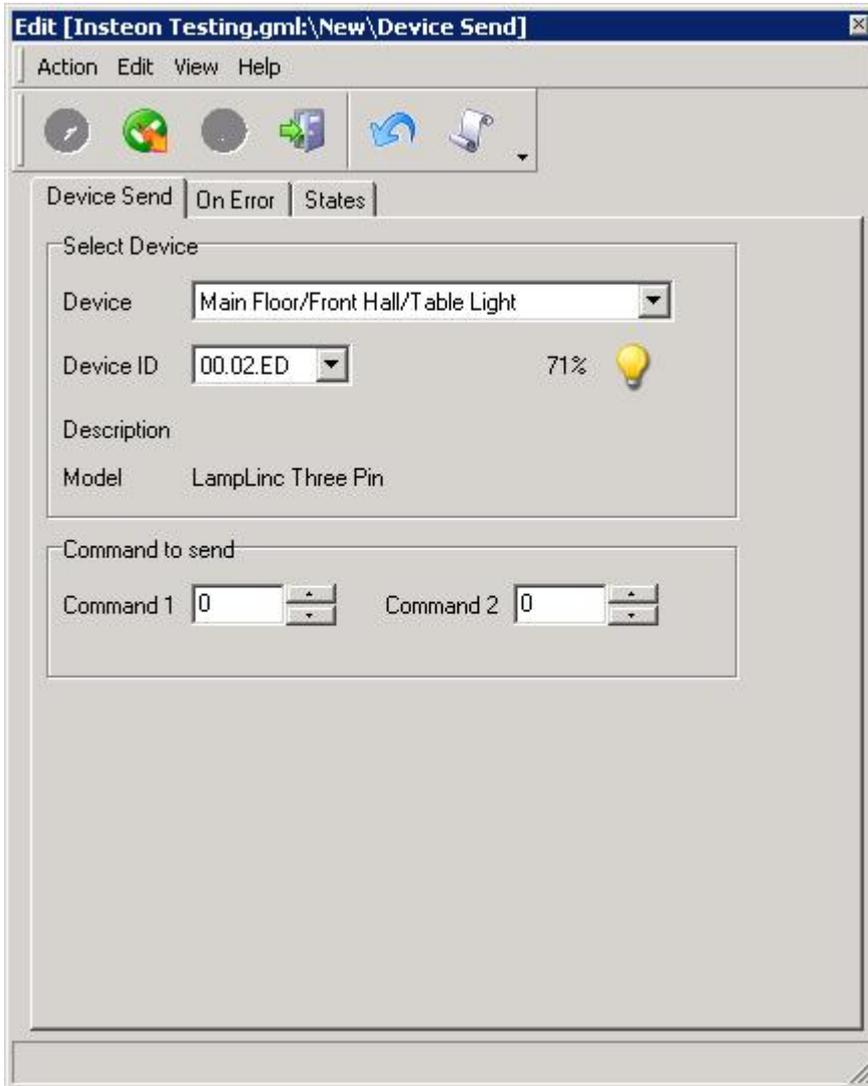
Command: Select the command to send.

Source: Insteon Plugin.

6.4 Device Send

Device Send | On Error | States

The Device Send Action can send any INSTEON Standard Message by specifying the two message bytes directly.



Device: If the device has been named, use this drop-down to select it.

Device ID: For unnamed devices, use this drop-down to select the device by INSTEON ID (the ID should be identified on a label on the device).

Command1, Command2: The Standard Message command bytes to send. See the documentation for the specific device to discover the Standard Message commands supported. Note that the command bytes are specified in decimal, 0..255.

Source: Insteon Plugin.

