

Building Macros

Before you get started on building macros, make sure that you've told Animation Director about the controllers and the device variables you're using.

You can create as many as 16 macros for one controller. For optimal organization, create separate macros for separate collections of tasks. Always create one macro to run when the controller is powered up, even if its purpose is only to call another macro.

You could create a macro to target a specific trigger device and perform a series of activities when the device is idle (not tripped). A different macro could perform a series of activities when a trigger device IS tripped. You could create a handful of macros that call on one another in succession without targeting any triggers. And still another macro might play music while "looping" through a series of light activities for a few minutes. Use your imagination.

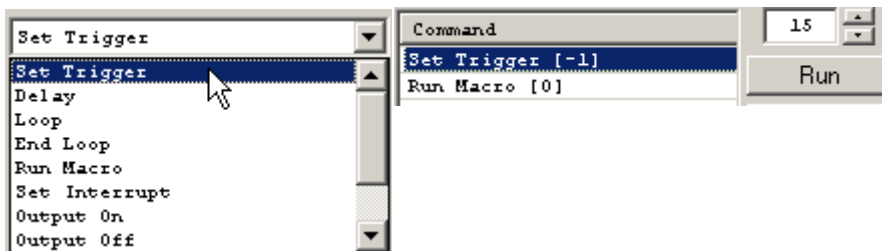
To build macros:

1. Click the **Macros** tool.
2. Select the target controller in the **Controller** list.
3. Select the command from the **Command** list, choose an option, and click **Add Command**.

If you make a mistake, just select it in the list next to the **Run** button and click **Delete Command**. The command you add is placed at the bottom of the command series. To move it somewhere else in the list, click-drag it to the desired spot.

To add multiple options, **Ctrl-click** to select discontinuous ones or **Shift-click** to select continuous ones.

The first six commands in the **Command** list apply to all the controllers and the rest of the commands are unique to each type of controller. Refer to the sections following these instructions to review what each command does and see some examples.



4. To create the next macro, click the number wheel above the **Run** button.
5. When finished, save the macro collection to a file or download it to the controller. When you download the collection, click **Run** to test them (engage your trigger device(s) if necessary).

It's a good idea to save your macro collection to a file for easy retrieval later. Also, you should save a macro collection for one type of controller before you create a collection for a different type of controller. Animation Director can't open a macro collection defined for a mix-match of controllers.

Set Trigger (for all controllers)

You'll need at least one macro that includes a "start" condition, so you'll use the **Set Trigger** command for this.

When power is applied to the controller, it looks through all the macros for the one that contains the command **Set Trigger [-1]**. Use this command and option in only one among your macro collection for a controller. To place this command in the macro, select **Set Trigger** and double-click the option **Board Power Up**. Then add whichever other commands you want run at that time to that same macro. For Light controllers, always use this type of trigger.

In this example, macro 15 calls macro 0 when the controller receives power.



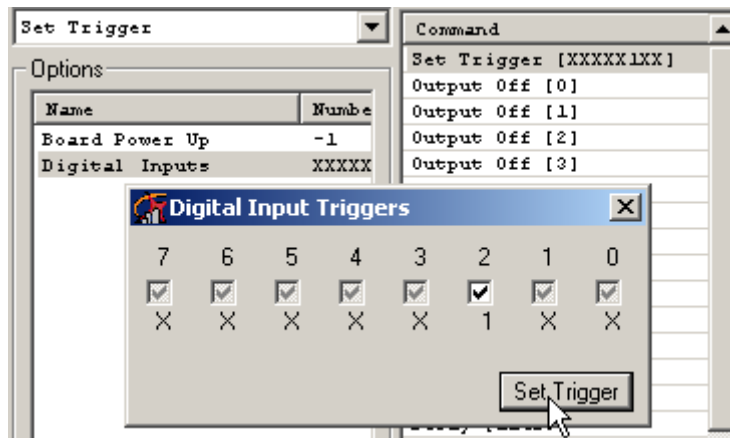
If the controller doesn't find the Set Trigger [-1] command, it looks for the **Set Trigger [XXXXXXXX]** command. You can use this trigger option in any of the macros for a controller to which you've connected trigger devices (DIO and MP3).

To place this command in the macro, select the controller with the digital inputs on it, select **Set Trigger** and double-click the option **Digital Inputs**.

Note: Make sure that your trigger devices are connected to one or more of the first 8 input terminals.

Then in the **Input Digital Triggers** window, click in the box for each trigger device you want to target for that macro. Click once to have the macro run when the device-to-controller circuit is open (1). Or, click twice to have the macro run when the device-to-controller circuit is closed (0). Then click **Set Trigger** in the window to place the command.

This example targets the input device connected to input terminal 2 on an MP3 controller and runs the macro when the circuit is open.



Set Interrupt

When working with trigger devices, there's often a scenario where the device is re-tripped before a command series has finished, such as when lots of footsteps travel over your sensor mat one after the next.

To NOT restart the command series when a trigger (specified with the Set Trigger command) is re-tripped, select the **Set Interrupt** command, choose option **0 (No)** in the **Options** area and click **Add Command**. At the end of the desired command series, select the **Set Interrupt** command again, choose the option **1 (Yes)**, and click **Add Command**.

Make sure you place any commands that you don't want interrupted between the two Set Interrupt commands. Any commands that precede or succeed the pair will be interrupted when the input device is re-tripped.

This example targets a trigger device connected to input terminal 0. When tripped, three output devices are turned off (**Output Off**). Then with no interruptions, the first track on the MP3 controller is played (**Play [1]**) and three output devices (**Output On**) are turned on. When the track is finished playing (**Wait for End**), those same three outputs are turned off and Set Interrupt is reset to Yes. Unless the trigger is tripped again, macro 8 is called up to run (**Run Macro [8]**).

Command
Set Trigger [XXXXXXX1]
Output Off [0]
Output Off [2]
Output Off [5]
Set Interrupt [0]
Play [1]
Output On [1]
Output On [2]
Output On [5]
Wait for End
Output Off [1]
Output Off [2]
Output Off [5]
Set Interrupt [1]
Run Macro [8]

Delay (for all controllers)

Use the Delay command to place pauses between actions, such as between light activities, playing tracks, or turning on/off output devices. To place this command, select **Delay** in the Command list. Then, in the **Options** area, choose the number of milliseconds for the delay (1000 milliseconds = 1 second) and click **Add Command**.

This example plays track 4 (sounds of thunder) on the MP3 controller while output devices (special lights) turn on and off with delays in between, emulating the pauses between lightning bolts.

Command
Play [4]
Output On [0]
Output On [3]
Delay [585]
Output On [4]
Output On [5]
Delay [2989]
Output Off [4]
Output Off [5]
Delay [1845]
Output On [1]
Output On [4]
Output On [5]
Delay [3457]
Output Off [1]
Output Off [4]
Output Off [5]
Delay [3454]
Output On [4]
Output On [2]
Output On [1]

Loop and End Loop (for all controllers)

Use the Loop and End Loop commands together. These commands are for targeting a device range or for running a block of commands (or the macro itself) a specific number of times. To place this command, choose **Loop** from the Command list, then choose your options accordingly. Place any commands that you don't want as part of the looping procedure before or after the Loop command block.

Important: Don't forget to include an End Loop command for every Loop command you use.

When looping the macro or a command block, set the **Loop Start** option to 0, then set the **Loop End** option to the number of times you want you want the command block run and click **Add Command**. For example, if you want a command block to run five times, Loop Start is 0 and Loop End is 5.

When using the loop for targeting a device range, set the **Loop Start** option to the starting light channel or device terminal you connected them to on the controller. Then, set the **Loop End** option to ending number in the desired range and click **Add Command**. For example, to target lights connected to the first 4 channels on the controller, Loop Start is 0 and Loop End is 3. To target devices connected to output terminals 5 through 7, Loop Start is 5 and Loop End is 7.

This example performs the macro five times. Note that another macro is called from inside the loop, so that macro is also run five times.

Command
Loop [0] [5]
Play [5]
Output On [0]
Output On [5]
Delay [15000]
Output On [4]
Output On [5]
Wait for End
Output Off [0]
Output Off [5]
Output Off [4]
Output Off [5]
Run Macro [3]
End Loop

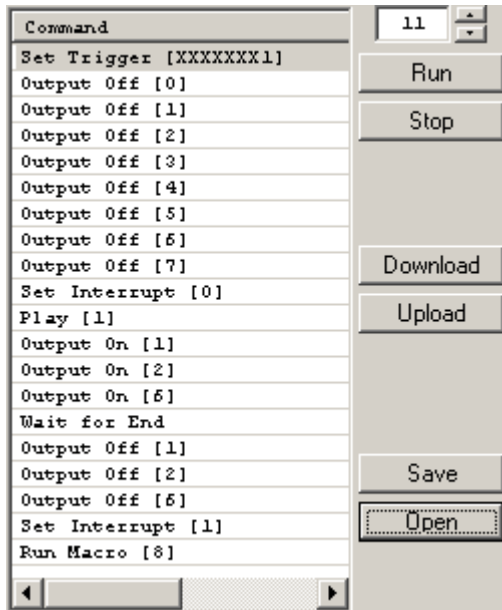
This example performs the macro when power is applied to the controller and runs the command block 10 times (**Loop [0] [10]**). Nested within the command block is another Loop command that targets light channels 0-3 (**Loop [0] [3]**). **Lights On [C1]** is a counter command you can use to target the range instead of placing four **Lights On** commands for each light in the range. You'd choose the **LoopCounter1** variable in the **Options** area. Note that there are three **End Loop** commands, as the example uses three loops.

Command
Set Trigger [-1]
Loop [0] [10]
Level [255]
Ramp [1000]
Loop [0] [3]
Lights On [C1]
Wait for Level [C1]
End Loop
Reverse Pop [1000]
Loop [0] [3]
Lights On [C1]
Wait for Level [C1]
End Loop
End Loop
Lights Off [C1]

Run Macro (for all controllers)

This command is for calling other macros from inside the macro currently running, adding an element of variety to your show. To place this command, choose **Run Macro** from the **Command** list. Then pick the macro number from the options area and click **Add Command**.

This example runs macro 8 (Run Macro [8]) when macro 11 is finished.



Audio Commands

These commands work with the MP3 tracks on the SD card inserted in the slot on your MP3 controller. Make sure that you've told Animation Director about all track variables you want to work with for each MP3 controller.

Play - The specified track is played once, then stops. To place this command, choose **Play** from the **Command** list, then double-click the track name or number from the **Options** area. To play the same track over and over, include multiple Play commands. If you don't want playback interrupted by a trigger device, precede the **Play** command with the **Set Interrupt - No** command.

Pause - Pauses the track playback from the preceding **Play** command while the next command is executed (such as engaging an output device). Playback is resumed when the subsequent command completes. To place this command, choose **Pause** from the **Command** list, then click **Add Command**.

Stop - Stops the track playback from the preceding **Play** command runs the next command. To place this command, choose **Stop** from the **Command** list, then click **Add Command**.

Wait for End - Waits for the track playback from the preceding **Play** command to finish before running the next command. To place this command, choose **Wait for End** from the **Command** list, then click **Add Command**.

Set Balance - Lets you set or change the balance of the two stereo speakers. The balance stays to what you set until you reset it with another Set Balance command. If you don't use this command, the balance is centered by default. Place this command before a **Play** command. To place this command, choose **Set Balance** from the **Command** list, then pick a number in the **Options** area and click **Add Command**. **0** is centered, **-128** is full left, and **127** is full right. The number wheel in the Options area lets you scroll between 0-127, so you'll need to enter any negative numbers.

Set Mute Level - Lets you set or change the mute level of the audio output of the track in the preceding **Play** command, such as when you want to play another track over the current track. The mute level stays to what you set until you reset it with another Mute Level command. If you don't use this command, the mute level is unmuted by default. Place this command before a **Play** command. To place this command, choose **Set Mute Level** from the **Command** list, then pick a number in the **Options** area and click **Add Command**. **0** = Muted, **255** = UnMute, and **1** through **-254** is a Soft Muted range. The number wheel in the Options area lets you scroll between 0-255, so you'll need to enter any negative numbers.

Set Volume - Lets you set or change the volume level of the audio output of the track in the preceding **Play** command. The volume level stays to what you set until you reset it with another **Set Volume** command. Place this command before a **Play** command. If you don't use this command, volume is full volume by default. To place this command, choose **Set Volume** from the **Command** list, then pick a number in the **Options** area and click **Add Command**. **0** = Off and **255** = Full Volume.

This example plays track 1 (**Play [1]**), turns on some output devices (**Output On**), then waits for the playback to finish (**Wait for End**) before turning the devices off (**Output Off**).

Command
Set Trigger [XXXXXXXX1]
Output Off [0]
Output Off [2]
Output Off [5]
Set Interrupt [0]
Play [1]
Output On [1]
Output On [2]
Output On [5]
Wait for End
Output Off [1]
Output Off [2]
Output Off [5]
Set Interrupt [1]
Run Macro [8]

Output Device Commands

All five of these commands work with your output devices. Make sure that you've told Animation Director about all device variables you want to work with for each MP3 controller and DIO controller.

To place the command, select it in the **Commands** list, choose the target device (or counter for a device range) and applicable timing in the **Options** area, then click **Add Command**. Make sure that if you turn something on, you also turn it off at some point.

Output On - Turns the specified device on.

Output Off - Turns the specified device off.

Output Pulse On - Pulses on the specified device over a time duration of the milliseconds specified.

Output Pulse Off - Pulses off the specified device over a time duration of the milliseconds specified.

Output Flash - Alternately turns the device on and off at the specified number of milliseconds.

This example works with a number of devices.

Command
Play [12]
Output Flash [100] [100]
Output Flash [200] [100]
Delay [6800]
Output Off [1]
Output Off [2]
Delay [530]
Output Flash [200] [100]
Output Flash [100] [100]
Output On [0]
Output On [3]
Delay [6221]
Output Off [1]
Output On [4]
Output On [5]
Delay [2521]
Output Off [1]
Output Off [2]

Light Commands

These commands work with the lights you've connected to a Light controller. Make sure that you've told Animation Director about all light variables you want to work with for each Light controller.

To place the command, select it in the **Commands** list, choose the applicable settings in the **Options** area, then click **Add Command**.

For each light or device range you're working with, first place the **Level** command to set the brightness intensity. Next, place one of the effect commands (Pop, Ramp, Flicker, etc.) and choose the rate at which you want the effect to perform using the number wheel in the **Options** area. The last to place in the trio is the **Lights On** command so you can target which lights to apply the level and effect. The level and effect is applied to all subsequent **Lights On** commands until you place another Level or effect command. Also make sure that if you turn a light on, you also turn it off at some point.

Level - The brightness intensity where 0 is the lowest (or off) and 255 is the highest (or brightest).

Wait for Level - Waits until the specified level is achieved before running the next command.

Ramp - Turns on the light gradually with increasing levels of brightness.

Fade - Turns the light off gradually with decreasing levels of brightness.

Pop - Pop-fades a light to quickly switch it on to full brightness, then turn it off gradually with decreasing levels of brightness.

Reverse Pop - Quickly switches the light off, then turns it back on gradually with increasing levels of brightness.

Blink - Turns a light on and off repetitively.

Sparkle - Randomly turns on and off a string of lights, making them look like they sparkle. Sparkle won't have an effect on a single light bulb.

Flicker - Randomly dims and brightens a light to make it flicker like a candle flame.

Shimmer - Dims and brightens a light to make it look like it's glowing.

This example works with a range of lights. The Level and Ramp commands are set to ramp the lights on to their full brightness when the lights are turned on inside the first loop. The Level command is placed outside of the Loop command so that this particular level is applied to all the lights for all the effects. When that loop ends, the effect changes to a Reverse Pop for the second loop. The outermost loop (commands between line 2 and line 14) performs the activities 10 times, then all the lights in the range are shut off.

Command
Set Trigger [-1]
Loop [0] [10]
Level [255]
Ramp [1000]
Loop [0] [3]
Lights On [C1]
Wait for Level [C1]
End Loop
Reverse Pop [1000]
Loop [0] [3]
Lights On [C1]
Wait for Level [C1]
End Loop
End Loop
Lights Off [C1]