madVR Envy

Screen Masking Control with Control4

1.0 Introduction

This document explains how to best integrate screen masking control with the Envy using Control4 and provides recommendations for best practices when automating screen masking.

Masking control is easily achieved with the Envy because it instantly detects the Aspect Ratio (AR) of all incoming content and exposes this information to Control4. With this information, you can then easily program your control system to automate the screen masking.

2.0 Implementing Screen Masking

The Envy uses the **OUTPUT_MASKING_RATIO** variable in the control system to report the AR in real-time as it changes. The value is a three-digit number, without any decimal. So, 1.78:1 (e.g., 16:9) is reported as 178, 2.39:1 is reported as 239, and so forth.

Tip: See our IP Control API documentation for details about how Envy reports the AR and related features.

When doing the programming, it can be useful to monitor the masking ratio value to confirm the value is as expected or for other debugging purposes. A good way to do this is to temporarily assign a button on the remote to display the masking value AR on the screen.

To do this, go to the Envy Driver in Control4 and first select "Device Specific Command" and then "Display Discrete Message." For the Message, select **OUTPUT_MASKING_ASPECT**, and set the Time to three seconds, or whatever you prefer.
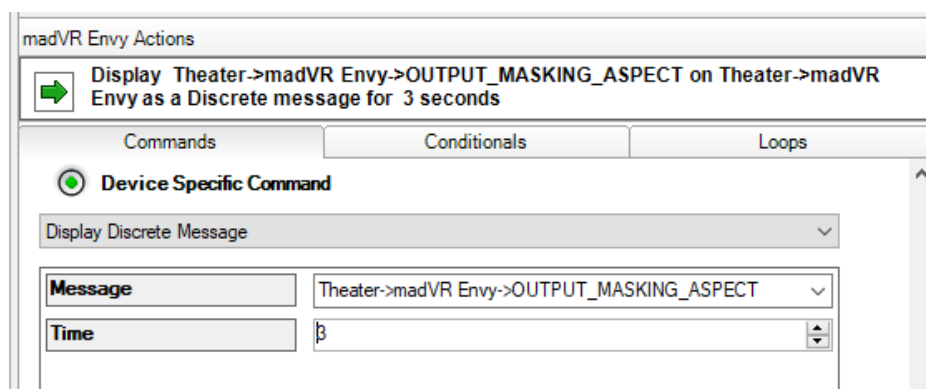
To program the masking trigger, configure a Conditional in the Envy's Device Variable OUTPUT_MASKING_ASPECT. Enter the desired value, such as "178" and drag it into the Script window, as shown below.
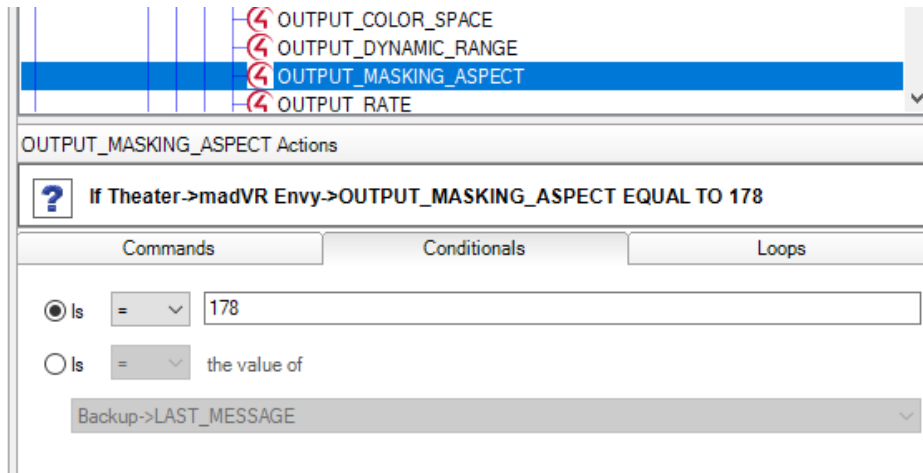
Then in the Script window, simply program the appropriate command to activate the preset for this particular AR. Do this for each AR you wish to program. Shown below is an example that uses previously defined Macros to control the masking.

3.0 When to Move the Masking

The remaining step is deciding on how and when you want the masking to move. A best practice is to move the masking just once, at the start of the movie, and not have the masking continuously changing during the movie. Otherwise, the masking would change every time you hit Pause or brought up other On-Screen Display elements which temporarily change the AR.

3.1 Automating the Masking

When automating the masking you must decide how long to wait once Envy reports the AR change before you trigger the masking to move. It is challenging to pick the right amount of delay because the time from hitting 'Play' to the time the actual movie content starts playing is

quite variable. This is due to various factors like FBI warning screens, previews, etc. We recommend using thirty to forty seconds, which usually works well.

There will be times, however, when the delay is not long enough, which results in triggering the masking adjustment before the actual movie content is on-screen. Similarly, if the delay is too long, this results in having the wrong masking position in place at the very beginning of the movie. To avoid this situation, you can manually trigger the masking instead.

3.2 Manually Triggering the Masking

Rather than automating the masking, you can assign a command to adjust the masking position to a physical button on an SR260, or to a virtual button for a Neeo or phone using the Control4 App. This requires the homeowner to press the button to move the masking once the actual movie content starts playing, but it ensures the masking is never incorrectly positioned, as can happen when automating the masking, per section 3.1.

3.3 Masking with Variable Aspect Ratio Movies

Variable Aspect Ratio (VAR) movies, such as Tenet, Aquaman, Interstellar, Batman and many others present a special challenge. Since the speed of moving the masking cannot come close to the instantaneous changes in AR made by the Envy, it is usually best to leave the masking open for the widest AR used with VAR movies. In this case Envy will still provide Constant Image Height (CIH), with black bars present during the narrower AR scenes in the movie.

Another strategy to manage VAR movies is to use a constant AR throughout the movie. This can be done with one of the Control4 Envy AR Experience Buttons, to either have the Envy "Hold" the widest AR, or to manually assign the AR used in the widest scenes (e.g., 2.40:1). With the correct AR properly framing the widest scenes, the Envy will keep the same screen width (cropping the top and bottom) during the narrower scenes. This is typically how these movies were viewed in most commercial theaters anyway.

3.4 Masking with Non-linear Stretch

The Envy can use Non-linear Stretch (NLS+) to stretch any AR content to fill any AR screen. For example, when watching 16:9 content on a 2.40 scope screen, NLS+ can be used to smartly stretch the content so that there are no black bars on the sides. When NLS+ is used, Envy automatically takes this into account when reporting the AR. In this case, Envy would report 2.40 as the masking AR so that your masking system will not close the masking for 16:9, as it would do otherwise, without NLS+. Likewise, if you use some NLS+, but intentionally not enough to fill the screen, Envy will report the AR accordingly. You would then need to add programming for non-standard AR values, which is beyond the scope of this document.

3.5 Masking When the System Is Powered Off and On

As a nice touch, we recommend using basic programming to automatically reposition the masking to the desired position for when the theater is powered off. And if you will be using the manual trigger method (see section 3.2), you might consider adding programming to position the masking to 16:9 when the theater is first turned on, since the menus of most devices and content are often formatted for 16:9.