SolidWorks Product Animation Documentation
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Use Case: Exporting full Unrendered/Rendered product demonstration animations using Solidworks and video processing software of choice.

Note on Subject: This documentation does not cover how to animate using Solidworks. For instruction on animation, visit Solidworks forums.

Note on Animation: I recommend animating product demonstrations in steps. Instead of creating one long motion study for the animation, split the animation into separate motion studies, each covering one feature of the product demonstration. For example, if the first part of the animation is an exploded view of the product and the second is a full rotational view around the product, animate each part in its own motion study. Once all motion studies have been completed, export each animation separately and splice the animations together using a video processing tool. This makes the animation process more error-tolerant and robust. A single error in rendering for one part of the animation does not require the entire animation to be re-rendered.

Software necessary:

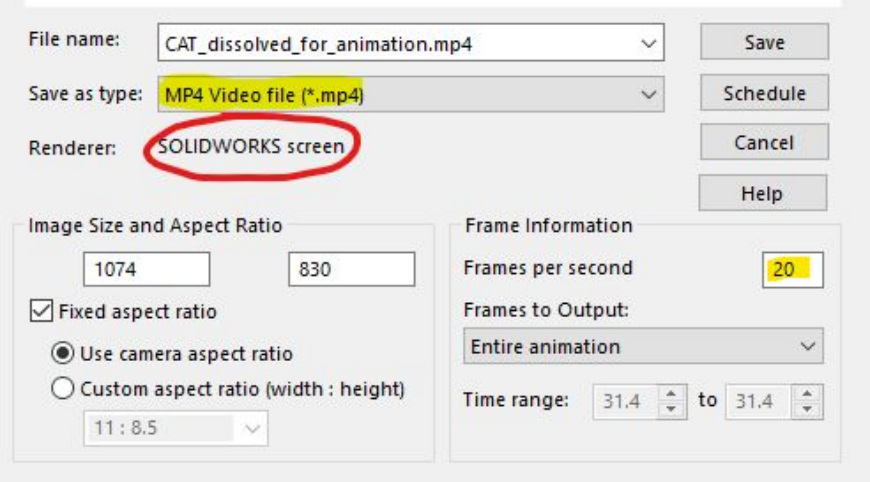
1. Solidworks with a PhotoView 360 add-in
2. Virtualdub (FREE simple video processing software)
    a. Install Virtualdub here : http://virtualdub.sourceforge.net/

Method A: Solidworks Screen Rendering

Rendering your animation using the Solidworks Screen creates a video file of your animation represented exactly as you see it on your solidworks screen. What your Solidworks screen displays as you test your motion study is exactly what you will see in the final video file. The upside of this method is that it takes significantly less time to render a full animation and runs into significantly less rendering problems. The downside to this method is the lack of visual aesthetic. Animating using this method may be less appealing for customers.

1. Once you have completed your animation, find the save animation button and click.

2. Make sure your animation format is selected as "**Solidworks Screen**". Adjust the other settings to your preference. Personally I recommend filetype as "**mp4**", framerate as **20 fps**, and rendering the entire animation. Repeat steps 1 and 2 for the remaining motion studies for other features.

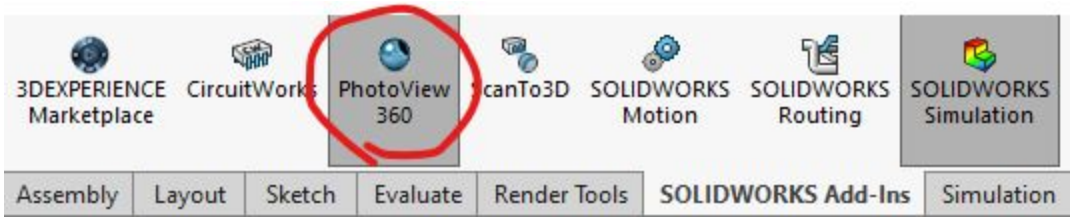


3. Once all motion studies have been exported as mp4, splice them together with any video editing software of your preference. Most built-in video editing software has the capability to join separate mp4 files together. If you are choosing to use Virtualdub, watch the following references.
    a. https://www.youtube.com/watch?v=NhwU0_BuInY
    b. https://www.youtube.com/watch?v=aArHimUOG7Q

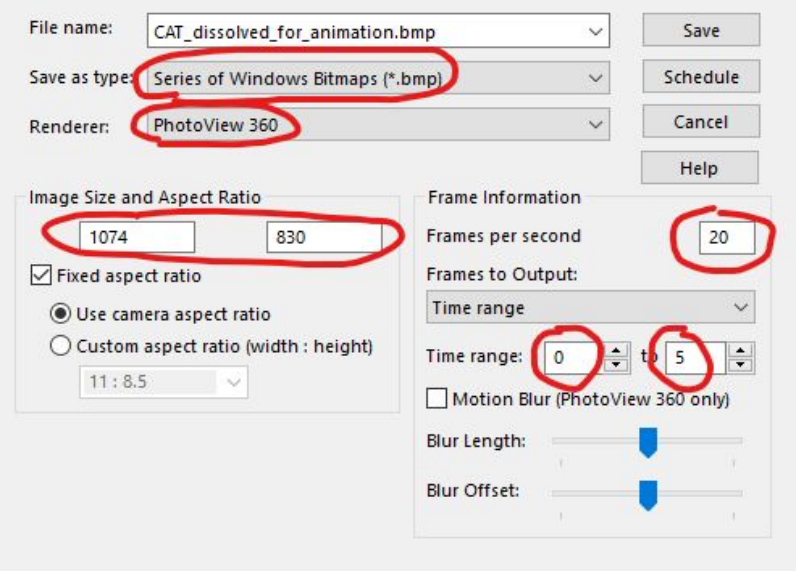
Method B: Photoview 360 Rendering (High Quality)

Photoview 360 is a built-in Solidworks add-in that allows the user to render HQ images of their part or assembly. Each frame of the animation is a full render of the part/assembly using Photoview 360. The upside of this method is the visual beauty of the final animation. Preferably, the final animation presented on consumer channels should be rendered in Photoview 360. The downside to this method is the extended rendering time. Each frame takes anywhere between 30 seconds to 1 minute to render. This adds up over hundreds of frames. Another downside of this method is its tendency to generate corrupted or faulty frames, especially when dealing with Camera motion used often in rotation or zoom in shots. The following methodology is designed to work around the intrinsic problems with Photoview 360 rendering.

1. Before you begin, make sure you have the PhotoView 360 add-in activated and that you are satisfied with the look of you product at full render (you can accomplish this by running a couple test renders)



2. Once you have completed your animation, find the save animation button and click.



*Steps 3-7 refer to this figure

3. Make sure your animation format is selected as "**PhotoView 360**". This option will not appear if you do not have PhotoView 360 activated.

   Note on method: The following steps are counterintuitive to rendering directly to a video but are designed to avoid PhotoView 360 problems. For an unknown reason, the camera systematically jump-cuts to another perspective after frame 99 of ANY render. All frames after frame 99 are stills from a faulty perspective. This may be due to the fact that full renders take a significant amount of processing power and fully-rendered frames take up more file space than Solidworks Screen frames. Solidworks may not have the built-in capacity to render more than 100 frames at a time.

4. Regarding the aforementioned problem, some simple arithmetic is necessary. Make sure you have set your filetype to "**Series of bitmaps**". This outputs each frame as a single bmp for you to eventually put together in Virtualdub.
5. Choose your framerate (**20 fps is recommended**). Based on your framerate, calculate how much time elapses over 100 frames. For my example, if the frame rate is 20 frames per second, then it would take 5 seconds to reach 100 frames.

6. Select the option to render only a specific time frame of your motion study. When prompted to enter your timeframe, **enter only the amount of time you calculated will take you to elapse 100 frames in Step 5**. This step will need to be repeated for every time interval until you have finished animating the entire motion study. Following my example, if the animation comes out to be 213 frames, two sets of 100 frames and one set of 13 frames will need to be rendered. Save each set of frames in a different folder.

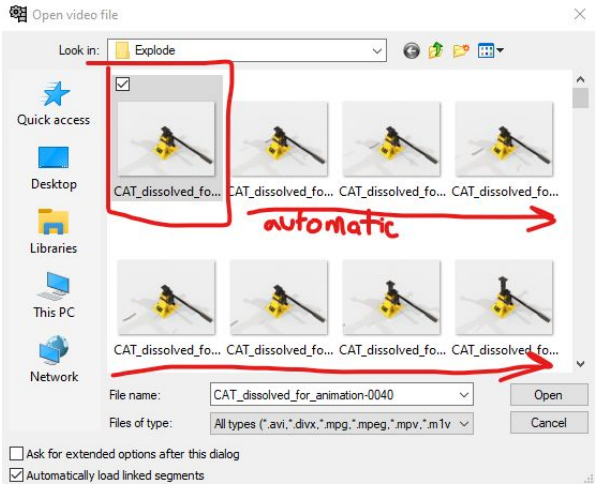
7. Finally, make sure that the “Image Size and Aspect Ratio” **does not change throughout the ENTIRE rendering process**. If you unknowingly change your frame size, Virtualdub will not be able to splice the frames together and you will need to take time and re-render.

8. Before you open Virtualdub, ensure that each set of frames does not have any faulty frames. These faulty frames, if they exist, will likely be at the end of the set. You can identify these frames by looking for a clear discontinuity in the frames. Delete all faulty frames.

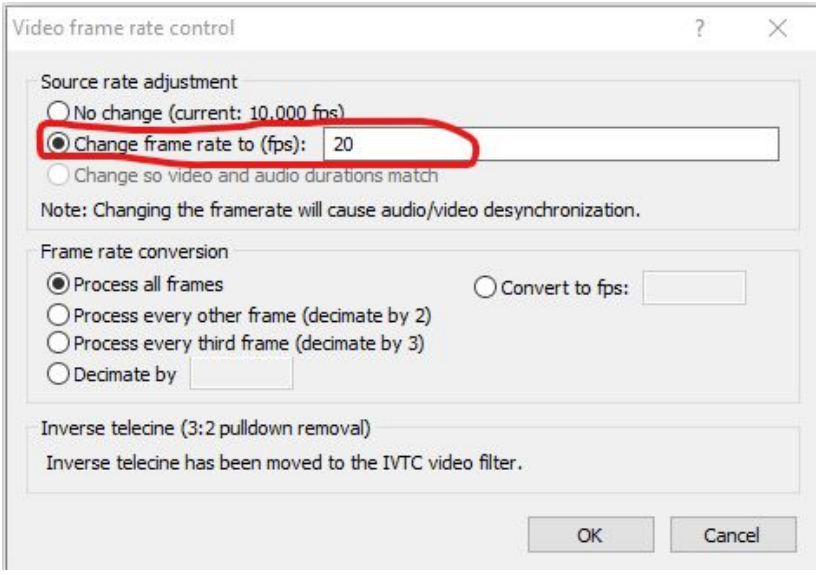
9. Once the faulty frames have been deleted, reorganize so that all frames from the motion study are in order in the same folder.

10. Once you have all frames from the motion study in order, open Virtualdub, click file, and click open video file.

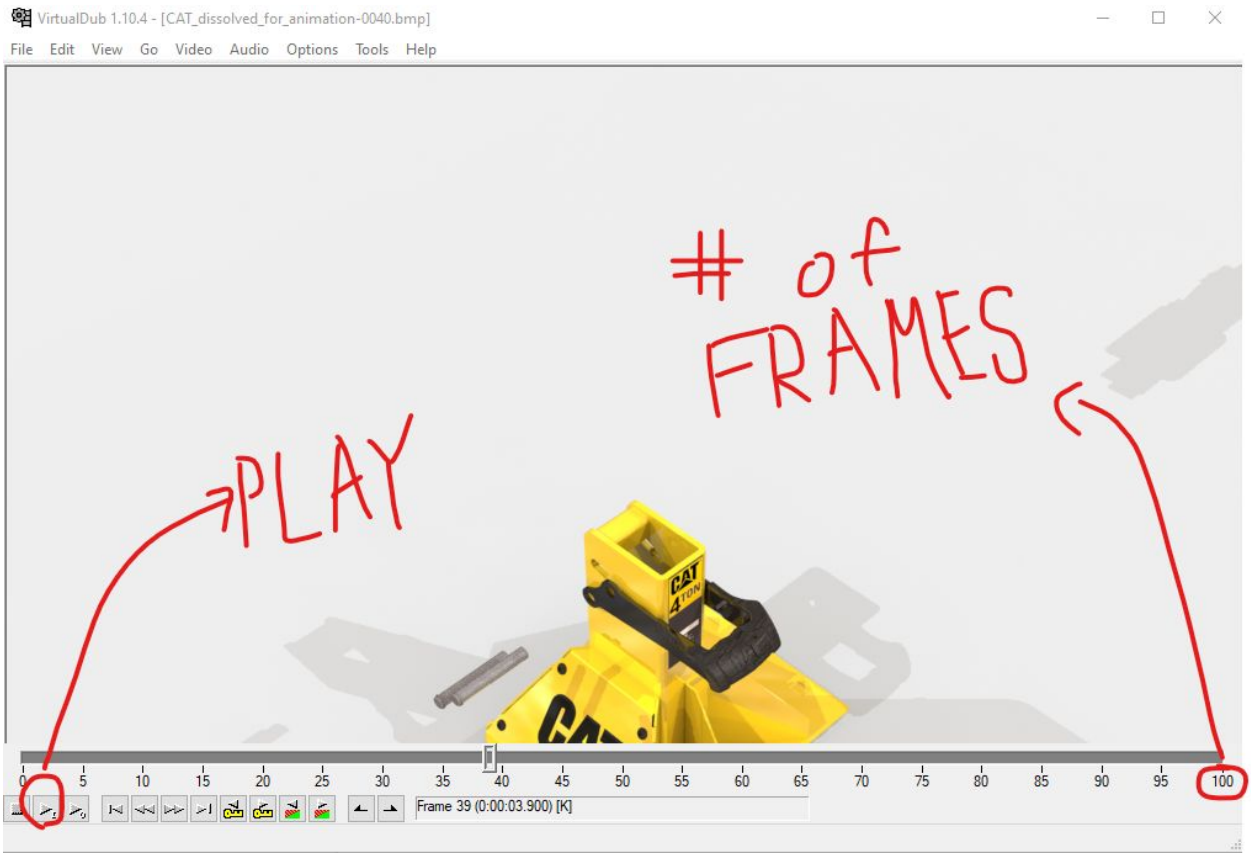
11. Navigate to the folder of your frames and just click the first frame, Virtualdub will automatically detect all of the following frames.



12. All the frames should now appear in Virtualdub. Select “Video” and select “Frame rate”. Select “Change frame rate to” and make sure the frame rate is the same as the frame rate you initially rendered in SolidWorks. Following my examples, I used 20.



13. Now that all frames are in Virtualdub, press play to test the animation and make sure it looks as intended. Double check the # of frames for accuracy.



14. Now it is time to export. Under “File”, Select “Save as AVI”. Once saved, the motion study is officially done. If there are multiple motion studies to combine into one animation, repeat the process for each motion study.

15. Once all motion studies have been completely rendered and saved as AVI, use any video processing software of choice to splice the AVIs together into one video. I recommend saving this combined video as an MP4, as the filetype is about 1000 times smaller than AVI. Most built-in video processing softwares have this functionality.

16. Finally, for the sake of space, it may be helpful to delete all the individual bitmap frames as well as AVI files from the computer as they are rather large files.