

PROJECT SETUP IN PREMIERE PRO

This handout is an excerpt of the [Best Practices and Workflow Guide for Long Form and Episodic Content](#).

Introduction

Premiere Pro runs on an incredibly wide range of hardware and configurations. This chapter provides hardware and settings recommendations geared towards film & TV productions.

Rather than give a single recommended spec, this chapter explains how Premiere Pro uses computer components so you can choose the hardware options best suited to your workflow and budget.

Hardware

Summary

If you aren't interested in the details that follow and just want a list to reference, use the following when shopping for computer hardware for Premiere Pro:

- **CPU:** The sweet spot is 8-16 cores, but keep in mind that core speed matters. 8 fast cores (3.5+ GHz) are usually preferable to 20 slower cores (2 GHz).
- **RAM:** Minimum 64 GB. Don't be afraid to go higher if you have large, complex project files.
- **GPU:** Buy as powerful a GPU as your budget can support. Keep drivers current. For NVIDIA GPUs on Windows, use the Studio driver rather than the Game Ready driver.
- **Storage Devices:** Install Premiere Pro on a fast NVMe boot drive and have a secondary fast SSD (internal or external) for Media Cache files.
- **Networking:** Use fast, modern network options like 10 GbE whenever possible. The SMB protocol works best for Productions.

A Balanced System

The key to building or choosing a good system for video editing in Premiere Pro is to build a powerful system with an eye for balancing the components to avoid severe bottlenecks in any one component. If your workflow is specific to certain video formats or workflows, you can use that to inform your choices when finding a good workstation.

Depending on the workflow, Premiere Pro can lean heavily on the GPU, or the CPU, or ideally both in unison.

CPU (Central Processing Unit)

Despite the recent advances in using the GPU and other dedicated video hardware, overall performance in any video editing system still comes down to a powerful CPU. For best performance in Premiere Pro, choose a CPU that has at least 8 cores and a minimum of 3 GHz clock speed.

It's true that more cores are generally better, but only to a point. The more cores a given CPU has, the slower each core will run. Since not everything video software needs to do can be split across multiple cores, there is still a benefit to having your cores be fast.

Therefore, there is a sweet spot for video editing, usually in the 8-16 core range. Look for reviews of a CPU you are considering to see how it handles video editing tasks.

RAM (Random Access Memory)

Generally speaking, as long as the RAM in your system is compatible with the CPU and able to run at its advertised speeds, you don't have to worry about the specifications any further. That leaves just the question of how much RAM to have. When using Premiere Pro on a professional workstation, start with 64 GB and increase from there as needed.

Premiere Pro's RAM usage consists of two main areas:

1. **Video frames decoded for playback:** This is what most people think of when considering RAM in Premiere Pro. For example, you might think "I'm working in 6K, so I'll need more RAM". While this is true, it's often more important to consider the second use case below.
2. **Project data:** When you open a project file in Premiere Pro, the data is read off of your drive and decoded into objects in memory. Each bit of data in the project uses more RAM. Every imported clip, every time an effect is used, every sequence, etc. will all use more RAM. Thus, for larger projects it is possible that the project data is using more RAM than the video frames decoded for playback mentioned above. The .prproj project file saved on your disk is compressed, so it's not at 1:1 mapping of file size to RAM used. For example, a 15 MB project file could require 4 GB of RAM once it is opened and ready to use.

GPU (Graphics Processing Unit)

The GPU is a specially designed type of processing chip that focuses on highly parallelizable tasks. A good example is applying a color shift to a video frame. Rather than your CPU cores going pixel by pixel and changing the color, a GPU can give a few pixels to each of its thousands of small cores and finish processing the frame more quickly.

This Help page has up-to-date GPU information:

<https://helpx.adobe.com/x-productkb/multi/gpu-acceleration-and-hardware-encoding.html>

The GPU is used in four main areas in Premiere Pro:

1. Hardware Accelerated Decode (playback)
2. GPU Accelerated Renderer
3. Hardware Accelerated Encode (export)
4. Sensei Machine Learning processing

Hardware Accelerated Decode

Premiere Pro can use the dedicated hardware on modern GPUs (or some CPUs) to decode certain formats more quickly than if it were done "in software", meaning as generalized software instructions. Think of it like slicing an egg: you could do it by hand, slowly slice by slice (software) or you could toss it in a dedicated egg slicer, press down once, and you're done (hardware).

Generally speaking, Hardware Accelerated Decoding is available for H.264 (AVC) and H.265 (HEVC) formats. There are some limitations as to what is supported based on things like frame size, bit depth, and chroma subsampling based on what your GPU supports.

Make sure Hardware Accelerated Decode is enabled in **Preferences > Media**.

GPU Accelerated Renderer

When your timeline playhead lands on a frame, the video frame is decoded to an uncompressed frame, then any effects are applied. GPU Accelerated Rendering refers to using the GPU to process any effects on the decoded frame. This could be a simple scale or position adjustment, a Lumetri color shift, or a third-party effect.

On Macs with Apple silicon the renderer will always be set to Metal.

The setting to control GPU accelerated rendering is found in [Projects Settings > General](#). On a Mac you should leave it set to Metal. On Windows with an NVIDIA GPU, set it to CUDA. On Windows with an AMD GPU, set it to OpenCL.

Switching to “Software Only” means the GPU will not be used when creating the frames you see on screen.

Hardware Accelerated Encode

Just as modern GPUs have dedicated hardware to decode H.264 and H.265 (described above), they also have dedicated hardware to export to those formats. When you are exporting to either H.264 (AVC) or H.265 (HEVC) you can take advantage of hardware accelerated encoding to export much faster.

Like with decoding, your specific GPU will dictate exactly which frame sizes, bit depths, and other settings can be used. If you use a setting outside of those, Premiere Pro will fall back to exporting using Software Encoding (on the CPU).

Sensei Machine Learning Processing

AI = Artificial Intelligence
ML = Machine Learning

The types of processing that are involved in running machine learning models and other types of AI/ML operations benefit from running on GPU hardware. Premiere Pro will use any available GPU or dedicated ML processors when using Sensei features like Auto Reframe, Scene Edit Detection, Auto Ducking, and more.

GPU Drivers

Drivers play a key part in being the translator between Premiere Pro and the physical GPU hardware. If you are on a Mac, you don't need to worry about the GPU drivers as they are bundled into the operating system. If using a Windows computer, make sure that your drivers are up to date from the manufacturer when you set up the system. You should update them periodically, for example between jobs.

If your system is working fine and the drivers are within a year or two, you don't need to be constantly updating them. Sometimes new drivers may introduce issues in GPU performance in video editing software.

NVIDIA GeForce GPUs have two types of drivers: Game Ready and Studio. Use the Studio drivers for best performance in Premiere Pro.

Storage Devices

There are three roles storage devices can play in your editing system. Higher end workstations will have separate physical drives for each role. Lower end systems or laptops can still work well even if a single drive is handling all three roles, assuming the drive is a modern, fast SSD.

1. **Boot drive:** It is recommended to install Premiere Pro on the system boot drive. This drive should be fast, ideally using the NVMe protocol. If your system doesn't or can't have other drives, this drive can fill the following two roles as well.
2. **Cache drive:** This should be a fast SSD dedicated to Premiere Pro. In [Preferences > Media Cache](#), set the Media Cache Files and Media Cache Database to this drive. You should have a dedicated cache drive for each workstation using Premiere Pro, and should not put the cache on a shared server.
3. **Media drive:** This drive holds your media and may sacrifice speed for a large capacity. While faster drives are always better, the main consideration for this drive should be that it is able to offer a read speed fast enough to handle the number of concurrent clips you need to play back multiplied by the bitrate of those clips. Shared networked storage is also commonly used as the media drive.

Networking

Premiere Pro is flexible with the type of networks it can support. As a best practice when building a modern networked storage, prefer 10 Gb Ethernet speeds as a minimum. These networks allow for many users to be using shared storage at once and can handle the higher bitrates of modern frame sizes.

While Premiere Pro can access media using a number of different types of network protocols, SMB is the preferred protocol for any type of shared setting. SMB is also recommended when using the Productions workflow in a shared environment.

Productions can work with other proprietary third-party solutions, but check with the third party vendor before assuming it works with Productions.

Hardware I/O Monitoring

Audio

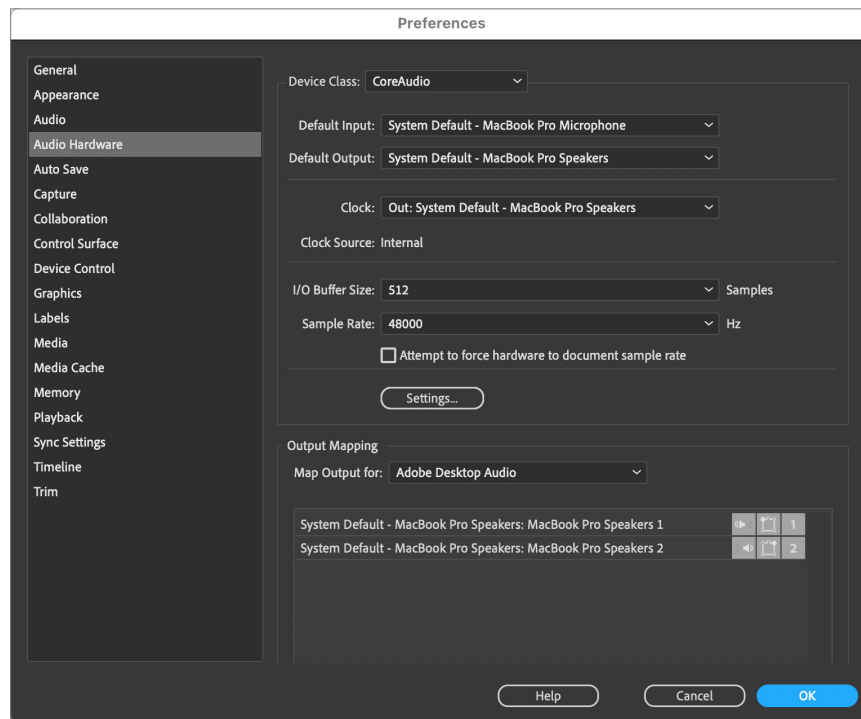
If you use a hardware audio monitoring solution, support in Premiere Pro should be essentially plug & play. Open **Preferences > Audio Hardware**, then select your device. If you are only monitoring audio (and using video on your computer monitors) you should leave Mercury Transmit turned off in the Playback preferences.

Video

Premiere Pro's system for monitoring video and audio externally is called Mercury Transmit. The settings for Mercury Transmit are found in **Preferences > Playback**. If you are sending audio along with the video over Transmit, make sure that your Audio Hardware preferences are *not* set to also use the same audio device.

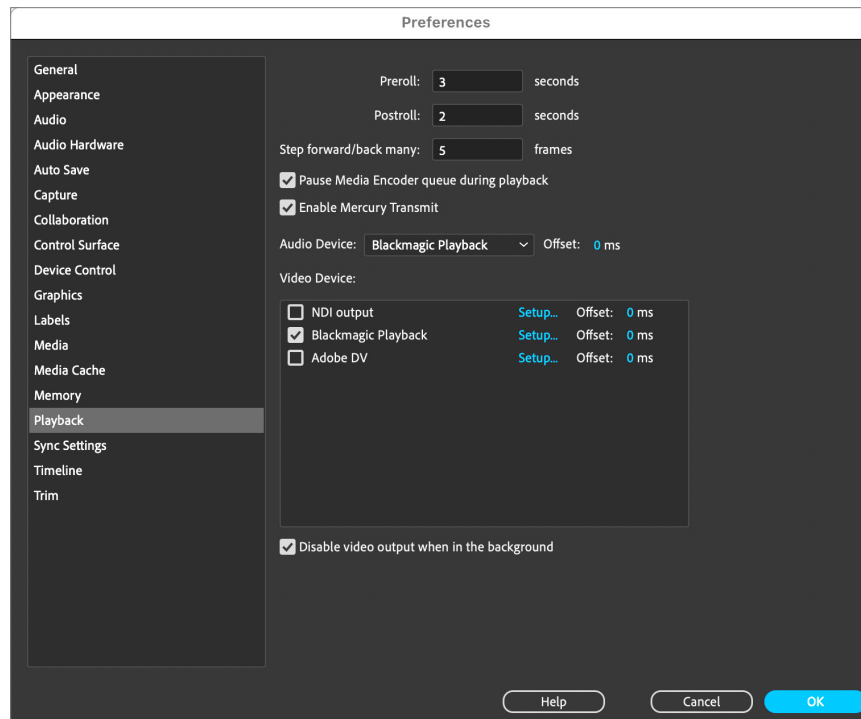
Having both Audio Hardware preferences and Playback preferences set to the same audio device can cause unexpected issues.

Audio Hardware preferences set to *not* use the Transmit hardware.



You can connect an additional display to your system's GPU output and select that display in the Playback preferences. Premiere Pro will then take over that full display and show whatever is playing in your Source or Program Monitor.

Playback preferences are set to use the Transmit hardware.

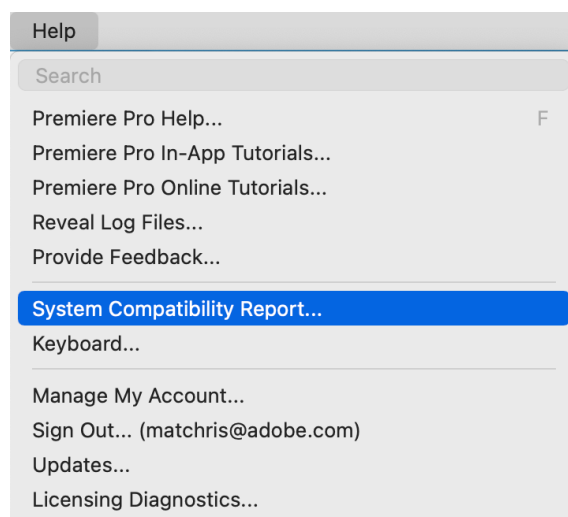


More advanced setups can utilize third-party hardware in the form of PCIe cards or Thunderbolt devices. These devices can often handle multichannel audio along with advanced video formats including HDR to monitor in professional setups. When using one of these systems, make sure to use the latest drivers from the manufacturer.

System Compatibility Report

Premiere Pro automatically performs a system check during launch to identify the capabilities of the hardware and detect any issues. If you see no alert, then no issues were found. If an issue is found, you will see the System Compatibility Report window explain what the issue is and how to address it.

You can view System Compatibility Report at any time by choosing it from the Help menu.



Operating System

Generally speaking, Premiere Pro can be expected to run on the current version of macOS or Windows, and the two previous major releases. Consult the requirements listed online for the currently supported operating systems:

<https://helpx.adobe.com/premiere-pro/system-requirements.html>

Settings & Configuration

Having a good hardware setup is important, but making sure to understand and configure some key options in Premiere Pro will ensure a fast and stable editing experience. This section goes over important best practices to consider and implement before starting a big project.

Project Settings / Production Settings

When working in a single project file, the settings found in **File > Project Settings** apply to that project and are stored inside the .prproj file. When working in a Production, the settings found in **File > Production Settings** are stored in the .prodset file found in the production folder and apply to any project opened by any user working in the production.

General > Renderer

This setting controls which rendering engine Premiere Pro will use. The rendering engine is responsible for taking a decoded video frame and applying any effects or modifications. Choosing Software Only means the CPU (and no GPU) is used. This method is the slowest and should only be used for troubleshooting.

If on a Mac, set the renderer to use the GPU Accelerated Metal engine. On Windows with an NVIDIA GPU, choose CUDA. On Windows with an AMD (or other) GPU, use OpenCL.

Scratch Disks

These scratch disk locations can be set wherever is best for your workflow. There is no need to set them to the same fast SSD recommended for the Media Cache. Note that in a Production workflow with a team, you need to set the scratch disks to a location that all users have access to.

Ingest Settings

Note that Ingest Settings are intentionally disabled when working in a Production to avoid unintended conflicts.

Media Cache Preferences

Where possible, Premiere Pro generates small cache files to speed up the loading and accessing of large amounts of media. The Media Cache works best when placed on a fast, dedicated solid-state drive (SSD), because then Premiere Pro is able to use the full speed of the drive without competing with other open programs or the operating system.

When working in a shared networking environment (like the Productions workflow), it is recommended to keep the Media Cache set local to each system.

In Premiere Pro, open **Preferences > Media Cache** and use the *Browse* buttons to set the Media Cache Files and Media Cache Database to your desired disk. Note that some very small Media Cache Files may still be written to the default location on the boot drive even if you set the preference to store Media Cache on an external drive. This is expected behavior.

XMP Preferences

Adobe's [Extensible Metadata Platform](#) (XMP) is a file labeling technology that lets you embed metadata into files themselves during the content creation process. Premiere Pro can use XMP to track separate media files that may have similar attributes like video files with the same file name from the camera. Premiere Pro has three XMP-related preferences found in **Preferences > Media**.

Write XMP ID to files on import

When enabled, Premiere Pro will write an ID into the XMP metadata for any imported media file. This ID can then be used to identify the clip when relinking after the media has been moved. If you are working in a Production on shared storage where every editor is using the same set of media, turn this setting *off* on all systems.

If you are setting up a project or production that will have the same set of media in different locations, follow these steps:

1. Open **Preferences > Media** and check "Write XMP ID to files on import"
2. Import the media (the ID is written into XMP)
3. Share the media files to the other editors

This way the ID is in the media files before they are shared, and everyone is using the same set.

Write clip markers to XMP

When enabled, marker data is written into the XMP file metadata (in addition to the project file data). This can be useful when marking up a clip that will be used in various different projects. You can create a new empty project, import the clip, and the markers will already be there.

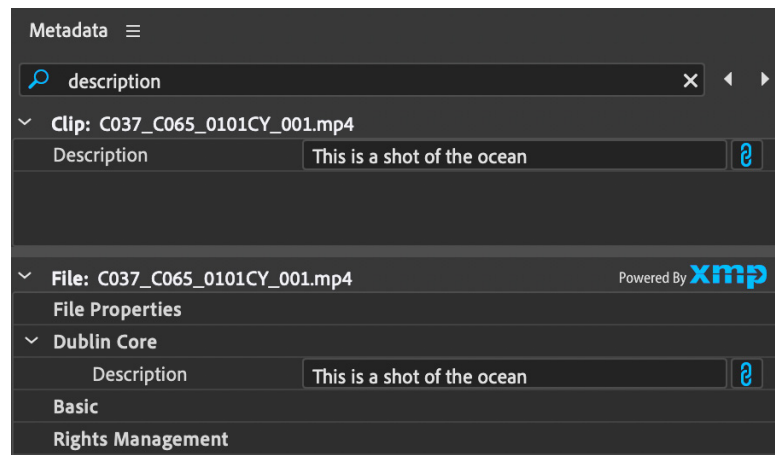
However, if you are working on shared storage or in a Production workflow it is best to leave this preference disabled as your markers will already share between users via the project file data.

Enable clip and XMP metadata linking

Premiere Pro has two different sets of metadata fields. One is Project metadata that includes common fields like Description, Tape Name, Scene, Shot, etc. The other is a broader set of XMP metadata fields, which contains many of the same fields as the Project metadata. Turning on this preference means that data entered into a Project metadata field can also be written into the corresponding XMP metadata field (if a match exists).

You can explore this using the Metadata panel. Select a clip, then in the Metadata panel search for a shared field, like "Description". If the "Enable clip and XMP metadata linking" is enabled, you will be able to toggle the chain link icon to link the two *Description* fields so that a change in one ripples to the other.

XMP metadata linking
enables toggling of the
chain link icon.



Auto Save Preferences

By default, Premiere Pro's auto save takes a copy of your project as it is in memory and writes it out as a backup file in the location specified in the Project or Production Scratch Disk settings. If you would like Auto Save to also save the project for you when it does an Auto Save, enable the setting "Auto Save also saves the current project(s)" found in **Preferences > Auto Save**.

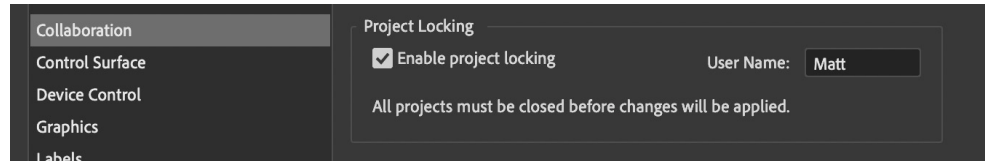
If you need to recover a file from Auto Save, navigate to the scratch disk location for Auto Save and locate the project file that matches the name of the project you are looking for. There will be one copy of the project with no user name or timestamp in the file name – this will always be the most recent Auto Save.

Older copies of the project will have a timestamp and, if Project Locking is enabled, the user name, appended in the format **ProjectName-YYYY-MM-DD_HH-MM-SS-UserName.prproj**

Collaboration Preferences

Project locking is enabled automatically when you work in a Production. You can also turn it on even if you are only working in a single project file. Project locking puts a .prlock file next to your project with the same name so that other Premiere Pro users won't be able to modify the file while you are editing. Once you close the project, the .prlock file disappears.

You can set a *User Name* in the Collaboration preferences so that other users can see who is working in any project in a Production.



Memory Preferences

The Adobe Video & Audio applications can share system RAM when working on the same media or projects, for example when using Dynamic Link between After Effects and Premiere Pro. In [Preferences > Memory](#) you can set how much system RAM is reserved for other applications.

A good rule of thumb is to leave roughly 20% of your memory for other applications. Dedicated workstations with large amounts of RAM can reserve even less.

Optimize rendering for

You should leave this setting set to "Performance". If you are working with high-resolution material and see a Low Memory Warning alert while working, change the setting to "Memory".

Playback Preferences

If using a Mercury Transmit device to play back video and audio, you choose that device in [Preferences > Playback](#). If you see "Setup..." next to your video device, you can click there to find hardware-specific options for use in Premiere Pro.

Use the *Offset* control if your video and audio are out of sync due to delays in one signal path or the other. For example if your audio is coming before your video, add an offset until it aligns.

If you'd prefer to think in terms of frames, use 1000 divided by your frame rate to find how many milliseconds (ms) is equal to one frame.

If you experience lag, failure to play or pause, or other unusual timeline behaviors while using a Mercury Transmit device, **make sure that the device is selected in [Preferences > Playback](#) and is not selected in [Preferences > Audio Hardware](#).**