Cytopaint™ Classic for Windows®

Frequently Asked Questions

Q: Is Cytopaint Classic for Windows available for purchase?

Q: Does Leukobyte use a subscription-based license model?

Q: Can the license dongle be used on multiple PCs?

Q: What is your return policy?

Q: Can I get a demo version of Cytopaint Classic for Windows?

Q: What operating systems are supported?

Q: Are there any issues running Cytopaint on Windows 11?

Q: What are the system requirements for Cytopaint Classic?

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Q: Is Cytopaint Classic for Windows available for purchase?

A: Yes! Version 1.2 beta is available for purchase direct from Leukobyte. **The list price for a single, untimed license is $2500 USD.** We do not offer subscription-based licensing.

You can order Cytopaint Classic for Windows by visiting our website.

Q: Does Leukobyte use a subscription-based license model?

A: No. Your security dongle will unlock Cytopaint Classic for Windows for as long as you own it.

Q: Can the license dongle be used on multiple PCs?

A: Yes. Your security dongle will unlock Cytopaint Classic on whatever computer it is presently plugged into.

Q: What is your return policy?

A: Cytopaint Classic for Windows can be downloaded and used free of charge for 30 days, with virtually no restrictions before you will be required to purchase a USB security module (dongle). We encourage you to evaluate the software to assure that it meets your needs prior to making your purchase. We do not offer refunds once we have shipped your security dongle(s).

Q: Can I get a demo version of Cytopaint Classic for Windows?

A: You can evaluate Cytopaint Classic in “enhanced” demonstration mode for 30 days without a USB security module (dongle). In enhanced demo mode you can analyze any FCS file, but printing functions are limited to the FCS files installed with the tutorials. After 30 days, Cytopaint Classic can continue to run without a dongle in “restricted” demonstration mode. In restricted mode you can only analyze the FCS files installed with the Cytopaint tutorials. You will need to purchase a security dongle to continue using Cytopaint Classic without restrictions. You can download the installer application at our website.

Q: What operating systems are supported?

A: Cytopaint is officially supported on **Intel-based PCs running Windows 10 and Windows 11 Pro or Home editions.**

Cytopaint will not run on Windows Server or Enterprise editions, or Windows for ARM processors.

A note about Windows 10: Microsoft is no longer releasing security or other Windows 10 updates without an ESU (Extended Security Updates) contract. We understand our customer's concerns that many perfectly usable computers cannot be updated to Win11 because of hardware limitations, and **we plan to support Windows 10 for as long as it is reasonably possible to do so.** We own older computers, too!

We strongly recommend avoiding 32-bit versions of Windows 10 and earlier, and advise you to only use 64-bit versions of Windows. All versions of Windows 11 are 64-bit. Cytopaint can run on 32-bit Windows, but there are severe memory constraints that will restrict the amount of system memory the application can access. This limitation (and others) will limit the size of FCS files that you will be able to process in Cytopaint, and may cause other performance issues.

Cytopaint ***should*** run fine on Windows 7 and Windows 8, but we no longer test on those systems and they are no longer supported. We do offer a free 30-day evaluation period so that you can confirm the application works as expected on your particular version of Windows.

Q: Are there any issues running Cytopaint on Windows 11?

A: An issue has been identified on Windows 11 systems that will prevent the new **Memory Integrity** security function from being enabled if older drivers for the USB Security dongle are installed on the system. We are currently updating our Cytopaint installer application to install the latest drivers from the company that manufactures the dongle (Keylok) that allow **Memory Integrity** to be enabled on systems that have not had previous Cytopaint installations.

Unfortunately, we can't automatically ***UNINSTALL*** any of the old drivers that cause this issue. There is a fix available if you need to have Memory Integrity enabled on your Win11 computer. We apologize for this situation, but we didn't write the drivers or the installer for the drivers, so we have no control over this issue.

Please read this Cytopaint Application Note for detailed information on this issue, and the steps you will need to take if you can't enable Memory Integrity on your Win11 system. This issue does not affect Win10 or earlier systems.

Q: Is there a version of Cytopaint Classic for macOS?

A: We do not plan on creating a macOS version of Cytopaint because it is not economically viable. It is ***POSSIBLE*** to run Cytopaint on **Intel-based** Macs using Parallels, VMWare Fusion or Bootcamp, but we do not officially support running on macOS because of the complexities associated with setting up and using an emulated environment. We cannot help with setting up or debugging macOS configurations.

We don't presently know of a way to run Cytopaint on a current generation, ARM-based Mac (with an "M1,M2,M3, etc." processor) because they cannot emulate Intel versions of Windows.

Q: What are the system requirements for Cytopaint Classic?

A: Our customers often ask us to recommend a PC for running Cytopaint, and the answer varies based on your workflow, your budget, and the type of data you will be analyzing (i.e. the number of parameters and events). With that said, we can make some recommendations that should help you determine what you might need in terms of a PC.

Operating System

Cytopaint is a Windows-only application. Supported versions are **Home and Pro Editions** of **Windows 10 64-bit or Window 11**. We strongly advise against using 32-bit versions of Windows.

Windows Server / Enterprise editions, and Windows for ARM processors are not supported.

Please see above for more detailed information.

Processor

About Processor Cores and Threads

When analyzing your data, all of the plots need to redraw themselves and all of the population statistics need to be recalculated every time you perform a paint operation or execute a Manipulate menu function. You can't perform your next action until all plots have redrawn and statistics calculations have finished, so the time it takes to complete those tasks can have a big effect on the time it takes to analyze samples.

Most modern processors can perform multiple tasks at the same time based on the number of ***threads*** they support. You will often see specifications for processors listing the number of physical ***cores*** that they have. If an Intel processor supports ***Hyper-threading*** then each core can simultaneously process 2 threads. So a 4-core processor with Hyper-threading can simultaneously process 8 threads. AMD's version of Hyper-threading is called ***Simultaneous Multithreading*** (SMT), and is identical in functionality.

Q: **What are the system requirements for Cytopaint Classic?** (continued)

More threads can make a big difference!

Cytopaint is a multi-threaded application, meaning that it recalculates plots and statistics in parallel based on the number of processing threads available to the application. If there are 2 threads available then 2 plots can be re-calculated at the same time. If there are 6 threads available then 6 plots can be recalculated at the same time, etc. The same is true for calculating statistics for all of the populations. So the total number processor threads on your PC can make a huge difference in how responsive the application feels. This is especially true if you have a lot of plots on screen, or you are processing FCS files with many events and/or parameters.

Cytopaint should run on any Intel/AMD processor capable of running 64-bit Windows 10/11. We've even tested it on a single-core Atom processor and it ran fine, but very slowly. In the real world you wouldn't want to analyze data on an underpowered PC, but it is possible.

Recommended Processors

An Intel Core™ processor with at a minimum of 4 cores and support for Hyper-threading for a minimum of 8 processing threads, or an AMD equivalent. **MORE PROCESSOR CORES ARE BETTER** (see above)! Most mid-level processors produced in the last 5 years should satisfy this minimum recommendation, and many older Intel i5/i7/i9 and AMD processors support Hyper-threading and will also be sufficient. ***We strongly recommend against running on Core i3, Pentium, Celeron, Atom, or other "budget" or SoC (System on a Chip) processors*.**

Memory

A minimum of 8GB of RAM. 16GB or more is highly recommended, particularly if you are analyzing samples with a large number of parameters or greater than one million events.

Storage

A reasonably-sized (256GB or larger) Solid State Disk (SSD) with more than 15% of the total storage available. An SSD's performance can severely degrade when less than 10% of its available storage is free. We strongly recommend avoiding systems with traditional hard disks (HDD) as they are very slow compared to SSDs, and the disk will be a performance bottleneck for the entire system.

Display

Many factors come into play when deciding on a display monitor, and there is no "correct" answer. That said, our minimum recommendation is a basic 24-inch monitor with a resolution of 1920 x 1080 pixels ("Full HD" or "1080p"). This is not an ideal size for displaying many plots, but for some users it may be sufficient. Most users will benefit from more screen real estate.

A monitor's **PIXEL RESOLUTION** determines how many plots can be shown at once. A 1080p monitor is a good starting point, but might not allow you to simultaneously show enough plots when you are working with high-parameter data.

Q: What are the system requirements for Cytopaint Classic? (continued)

In recent years, reasonably-priced 2560 x 1440 pixel ("QHD") monitors have become common, and often cost just a little more than similar 1080p models from the same manufacturer. We highly recommend using a 27-inch QHD monitor if it fits your work area and your budget.

You also need to be aware of the **PHYSICAL SIZE** of the monitor. A 27-inch monitor doesn't necessarily display more pixels than a 24-inch monitor. There are 1080p monitors in both sizes, and they would display the same number of plots. The difference is that the plots would be bigger on the 27-inch monitor. Don't underestimate the significance of both pixel count and physical size. There are 13-inch laptop screens that are capable of displaying 2880 X 1800 pixels, and while it's true that you could display many plots on such a screen, the plots would likely be too small to work with.

Graphics Processors (GPU)

You do not need a dedication GPU to run Cytopaint, but there are some cases where you might consider a PC that has one. Any main system processor that meets the recommended criteria above should have some sort of integrated graphics processing built into the chip that should be sufficient for a single-monitor setup with a 1080p or QHD display. The only time a GPU will be utilized by Cytopaint is when plots are redrawn, and this is not a demanding process compared to high frame rate gaming or watching videos.

A separate GPU may shorten the time it takes to perform your analysis, or allow you to have other applications open and displayed while running Cytopaint in a multi-monitor setup. It may also be a necessity you are using a monitor that displays more pixels than a QHD monitor.

In the last few years the AI industry has been buying up graphics cards, so the chips have become very expensive. This ia especially true for high-end cards. The good news is that ANY dedicated graphics processor made in the last 5-7 years will be much more powerful than any integrated GPU found on a processor chip, and should be sufficiently powerful to speed up Cytopaint's ability to redraw plots.