

Several tips on how to choose a suitable computer

This document provides more specific information on how to choose a computer that will be suitable for scanning and post-processing of your data with Artec Studio.

On our web-site you can find general requirements, in this document we'll try to cover all of them and provide more detailed explanations. It also contains some tested configurations and some tips and tricks to make your hardware perform in the fastest possible way.



Visit our website
to find out more
www.artec3d.com

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General requirements to hardware

Processor: I5 or I7 recommended

Memory: 8Gb for Artec Eva / 12 Gb for Artec Spider

USB: 1 USB 2.0 port for a regular scanner. To connect several scanners, we recommend using computers with several independent USB 2.0 hosts, or PCI-Express USB 2.0 cards

Video cards: NVIDIA/ATI

Recommended: NVIDIA GeForce 400 Series or better, at least 1GB of memory.

OS: Windows 7 or Windows 8 - x64

Not supported

(more information can be found below):

- Windows XP
- 32-bit OS
- Intel graphics cards
- Dell's 'Precision' series laptops

Not recommended

(more information can be found below):

- Xeon processors marked "for server use"
- SLI configuration
- NVIDIA Quadro series



Processor



1.1. Recommended processors and microarchitecture

Recommended processors are Intel i5 or Intel i7 ([Nehalem microarchitecture](#) and later).

1.2. What about Xeon?

Generally we do not recommend to use Xeon processors, as according to our tests, scanning speed is lower (9-10 fps on Xeon, when i7 provides 14-15 fps).

So Xeon processors will work with Artec Studio, but if you want the fastest possible performance, then it is better not to use them.

The scheme with Xeons is like this:

- all processor cores are calculating with very fast speed
- usually such server machines use special type of RAM (combination of 2 technologies - [ECC memory](#) and [Registered memory](#)). This RAM is slower comparing to "usual" machines
- we receive situation like this: calculating speed is fast, but transferring of results from/to memory is slow.

As the result processors are usually free and memory is busy.

How to check at your side:

- 1) download [AIDA64 diagnostic utility](#)
- 2) generate report on necessary machine
- 3) investigate sections 'Memory read' and 'Memory write'

Usually there are strings like:

- Core i7 Extreme 965 3333 MHz Asus P6T Deluxe X58 Triple DDR3-1333 9-9-9-24 CR1 12065 Mb/sec
- Xeon E5450 3000 MHz Asus DSEB-DG i5400 Dual DDR2-667FB 5-5-5-15 3861 Mb/sec

So you find your processor in the list and all processors around is a kind of comparison test.

If the speed of is too low (comparing to others), then unfortunately there is nothing we can do to from our side to exploit processor better, it is due to hardware.

RAM

General rule is 'the more RAM - the better'. Raw scans with texture from Eva/Spider takes much space in RAM, so 8 Gb is really minimum (16 Gb and more is enough for comfort fast post-processing).

This rule is especially actual for Artec Spider, as it is collecting very hi-resolution data and it takes plenty of RAM. That's why for Spider we recommend minimum 12 Gb RAM.

USB

3.1. General recommendations

You will need 1 USB 2.0 port for a regular scanner.

3.2. Connecting several scanners/sensors to 1 computer

It is recommended to use desktop computers (not laptops) for bundles of several scanners or sensors. You will need several independent USB 2.0 hosts or PCI-Express USB 2.0 cards (1 scanner/sensor should be plugged to separate USB controller, that's important).

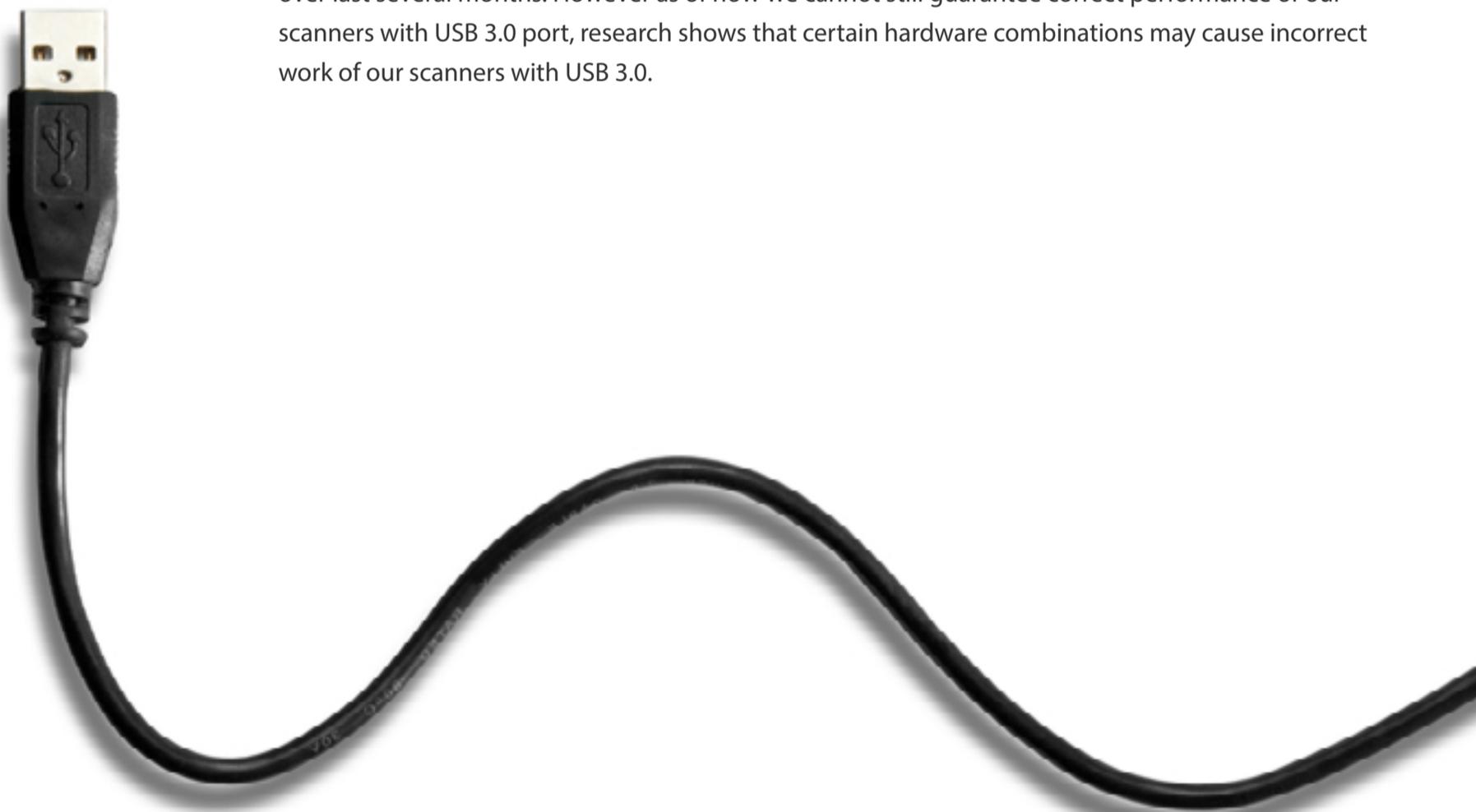
If you want to create a bundle of several sensors, then please use [this instruction](#) (it is written in form of FAQ).

3.3. USB 3.0

Support of USB 3.0 is a high priority of our RnD department, and significant progress has been made over last several months. However as of now we cannot still guarantee correct performance of our scanners with USB 3.0 port, research shows that certain hardware combinations may cause incorrect work of our scanners with USB 3.0.

Small note:

to make your Asus sensor work with USB 3.0, you should [update firmware of the sensor](#).



Multi-sensor bundle support in Artec Studio 9

This document includes all the information about multi-sensor bundles (Kinect, Asus, PrimeSense). It is written in FAQ form, so please feel free to use the information below.

Are there any special hardware requirements?

Yes, there is quite an important restriction: it is obligatory that every sensor is plugged to a separate USB controller or to a separate PCI Express card.

So should I use a desktop machine for a bundle? Not a laptop?

Yes, it is better to use a powerful desktop machine.

According to our tests, even a two sensor bundle does not work on laptops.

Can I combine sensors of multiple types?

Yes, it is possible (we used PrimeSense + Asus in one of our experiments).

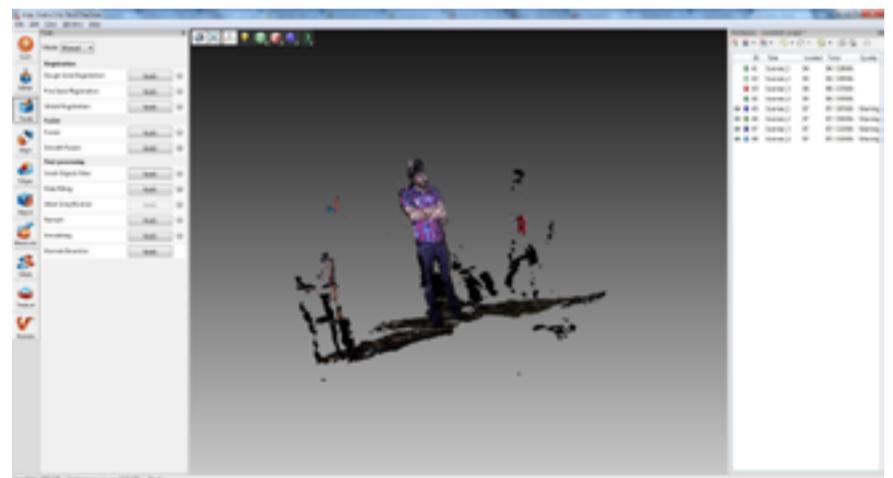
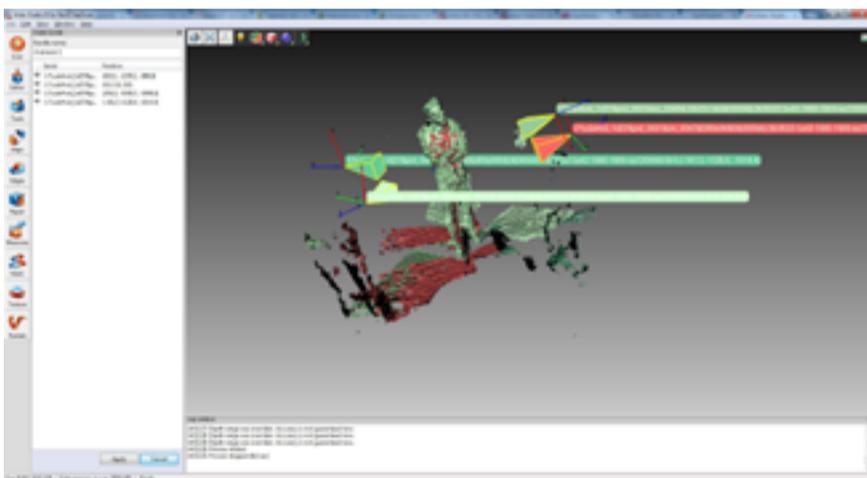
Microsoft states that maximum 4 Kinects for Windows or not more than one Kinect for XBox can be plugged to a single computer at the same time.

How many sensors can I use at the same time?

We have tried with 4 sensors and they were performing well. Please keep in mind the 'separate USB controllers' restriction.

Any videos or pictures to understand how it works?

Yes, we have a [sample video](#) (it was recorded on a mobile phone, so quality is not very high). Take a look at the pictures illustrating process in Artec Studio (bundle creation and recorded data): [picture1](#), [picture2](#).



4.1. What is supported and what is definitely not supported?

We support NVIDIA/ATI cards and do not support Intel graphics chipsets.

Recommended card is NVIDIA GeForce 400 Series or better at least 1GB of memory.

Note:

If you are using computer with Quadro card, then please find more information about Quadro optimization in p.6.2.

4.2. What about Quadro cards?

Quadro cards are not recommended - we have a lot of clients who work with them (for example, K1000M, K2000M and K3000M), but Quadro is a very special types of video cards, that differs a lot from standard NVIDIA GPU. We usually recommend to use NVIDIA GeForce.

The strong reason to buy Quadro card is if you plan to use Stereo mode in Artec Studio (please see p. 4.5. below).

If you do not plan to use Stereo, then it is a good idea to buy GeForce instead of Quadro.

4.3. What about SLI?

We do not support SLI configurations, so if you have a machine with such hardware, we'd recommend to disable one of the cards.

4.4. Do you support laptops with NVIDIA Optimus technology?

Yes, we support them. More detailed instruction about the settings can be found below in p.6.2.

4.5. Stereo support

In Artec Studio we support stereo mode that renders the model in 3d on stereoscopic displays (3d glasses are needed). To enable this mode, OpenGL Stereo must be supported by the videocard. Currently NVIDIA Quadro professional graphic card family is the only videocards supporting this stereo mode.

4.6. Real-time fusion requirements

[Real-time fusion](#) is a special algorithm that builds the model right in process of scanning (it uses GPU intensively). If you want to scan in RTF mode, then your videocard should support OpenCL 1.1 and higher

4.7. GCTest

We have a Graphic Card Test utility that runs sample texture mapping algorithm and sample real-time fusion algorithm on your videocard and provides the results. If both algorithms work correctly in GCTest, it means that your videocard supports Artec texture mapping and scanning in real-time fusion mode. You can [download the utility here](#).



5.1. What is recommended and what is not supported?

- We recommend Windows 7 and Windows 8 - 64-bit.
- Windows XP is not supported.
- Also please pay attention that starting from Artec Studio 9.2. we do not support 32-bit versions of software.

5.2. Do you have version for MacOS?

We do not currently have version for MacOS, but there are several clients who install Windows on their Macbooks (as parallel OS via BootCamp or on virtual machine inside MacOS). Please note that in case with Windows installed on virtual machine under MacOS, virtual machine will cut off some functionality of the videocard, for example, texture mapping and real-time fusion will definitely not work.

Several tips to increase performance

6.1. Desktop machines

- Please make sure that scanner is plugged in USB slots on the back side of your computer.
- Make sure that no other devices are connected to the same USB controller
- For better performance and for faster post-processing of big projects please use SSD.

6.2. Laptops

Make sure that your laptop is switched in 'High performance' mode.

It can be done here: *Control Panel* → *Power options* → *High performance*

Experiment with different USB ports: vendors of the laptops usually connect extra hardware like touch-pad or card reader to 1 USB controller, so scanner plugged to the same controller will not show good performance. The idea is to find port with the best performance and to make sure that no other devices are connected to the same USB controller

If you have a laptop with **NVIDIA Optimus technology** (Intel + NVIDIA videocards), then please follow the instructions below:

- 1) run *Control Panel* → *NVIDIA Control panel*
- 2) select "Manage 3D settings" link
- 3) select "Program settings" tab
- 4) click "Add"
- 5) select Artec Studio executable file (for example: C:\Program Files\Artec\Studio\astudio.exe)
- 6) select "High performance NVIDIA processor" setting

If you have a laptop with **Intel+ATI videocard**, then please follow the instructions below:

- 1) run Catalyst Center
- 2) switch to 'High Performance GPU'

6.3. Quadro cards

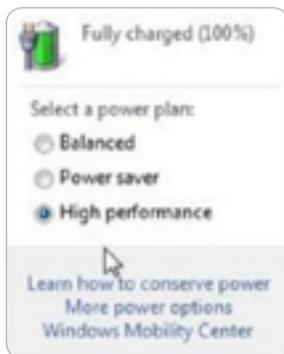
If you have **NVIDIA Quadro card**, then please follow the instructions below:

- 1) run *Control Panel* → *NVIDIA Control Panel*
- 2) find "Threaded Optimization" parameter
- 3) switch its value from AUTO to OFF
- 4) if you are using **Quadro K4000M**, then please review this list of tested drivers (tests were performed in June 2013):

version 320.00 - Artec Studio texture mapping does not work

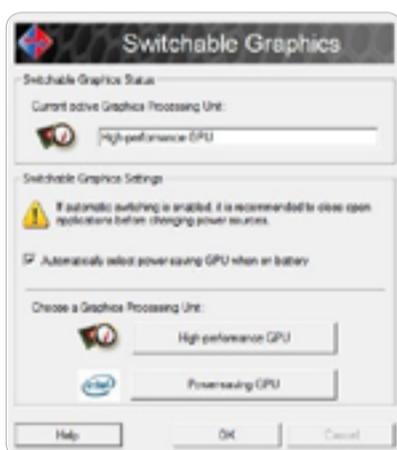
version 311.50 - Artec Studio texture mapping does not work

version 307.83 - Artec Studio texture mapping works correctly



Important:

make sure that you have the latest drivers installed on your laptop!



Frequently asked questions

7.1. What laptops does Artec use? Can you recommend any particular model?

To give you a hint, here is the list of laptops we are using by ourselves for outdoor scanning and all exhibitions:

- ASUS G53S (it can be upgraded with extra RAM if necessary)
- Sager (Win7, i7 3840 Qm, 32 Gb RAM, NVIDIA GeForce GTX 670 MX)

And here are some models that our clients use:

- Lenovo W520 (Win7, 16 Gb RAM, NVIDIA Quadro 2000M)
- Toshiba Satellite P855-30D (Win 7, Intel Core i7-2670QM 2.2GHz, 8 Gb RAM, NVIDIA GeForce GT 640M, 2 Gb of dedicated memory)
- Samsung NP700Z5C laptop (Win v7, 8Gb RAM, i7-3615QM, NVIDIA GeForce GT 640M)

Right now we have extremely positive feedback about Sager laptops - they are really very powerful and provide excellent performance of Artec Studio.

The only one recommendation about Sager is that it is better to use Windows 7 (for some unknown reasons laptop with Win7 and Win8 with the same hardware will show faster performance with Win7).

7.2. And why did you add Dell laptops from 'Precision' serie to 'not supported' list?

We have clients who buy them and use successfully, though there were several cases when USB ports do not provide good scanning performance and laptop is heated too much. The bad thing is that you will never know it until you buy laptop, install the software, plug the scanner and start scanning process. That's why we decided to exclude Dell 'Precisions' from supported laptops, it is hardware issue that we can not influence at our side.

7.3. Can I test your software somehow?

Sure, you can test it. There is a trial version available [on our web-site](#), please feel free to download and install at any machine to test the performance.

Hope you will enjoy using Artec Studio!

For any questions or comments please
contact support@artec-group.com