

# **GP Magnet**

***Parallel Micromagnetics Problems Solver***

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**Computer Requirements**



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## List of Changes

VERSION DATE	CHANGES
1.0.00 01/07/2012	
1.1.00 30/07/2012	
1.1.01 28/08/2012	<ul style="list-style-type: none"><li>Updated the subsection <a href="#">1.2 Software Requirements</a> of the section <a href="#">1 Computer Requirements</a> adding the information about the needed version of the Nvidia driver to monitorize the GPUs status with the nvidia-smi command.</li></ul>
1.1.02 29/01/2013	
1.2.00 12/12/2013	<ul style="list-style-type: none"><li>Updated the subsection <a href="#">1.2 Software Requirements</a> of the section <a href="#">1 Computer Requirements</a> adding the compatibility with Windows 8.</li></ul>
1.2.01 26/06/2013	<ul style="list-style-type: none"><li>Updated the subsection <a href="#">1.2 Software Requirements</a> of the section <a href="#">1 Computer Requirements</a> adding the compatibility with Ubuntu 14.04 LTS.</li></ul>





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# 1. Computer Requirements

Here are the Hardware and Software requirements necessary to use GPMagnet correctly and without any problems.

## 1.1. Hardware Requirements

GPMagnet is developed in C++ and [CUDA](#)<sup>1</sup> (Compute Unified Device Architecture), so that a **NVIDIA CUDA capable GPU** (Graphic Processing Unit) is required in your computer.

The **CUDA Capabilities** can be checked at [CUDA GPU Capability](#)<sup>2</sup>:

- Lower than 1.3: GPMagnet will automatically run in Single Precision, even though it will not be sufficient for some stiff micromagnetic problems.
- Larger or equal to 1.3: full double precision features are allowed.
- Larger or equal to 2.0: full double precision features are allowed and have support for the Fermi Architecture, which provides more functionality and much improved performance.
- Larger or equal to 3.0: full double precision features are allowed and have full support for the Kepler Architecture, which provides more functionality and much improved performance, increasing the number of cores and decreasing the power consumption (recommended).

As the amount of **GPU memory**, the size of the problems that can be simulated depends on the memory that is available on the GPU. So we recommend GPUs with large amounts of memory for large simulations.

<sup>1</sup> [http://www.nvidia.com/object/what\\_is\\_cuda\\_new.html](http://www.nvidia.com/object/what_is_cuda_new.html)

<sup>2</sup> [http://www.nvidia.com/object/cuda\\_gpus.html](http://www.nvidia.com/object/cuda_gpus.html)



As the amount of **RAM memory**, the number of simulations and post processing tools that can run simultaneously depends on the amount of free RAM memory. For a single simulation or post processing using the GUI, we recommend at least 1.5 GB of RAM memory. For a single simulation launched from the console, we recommend at least 512Mb of RAM memory.

To install GPMagnet, you need at least 450MB free hard disk space in Linux Systems and 400MB in Windows Systems. To execute simulations, this space is increased significantly depending on the number and size of the output files generated from the simulations.

To use the GPMagnet software, the USB key that was provided with your copy of the software must be connected at all times during the execution of the application. Otherwise you can't use the software, because this USB key has all the information license for your copy of the software.

**IMPORTANT:** Save this USB key in a safe place and don't lose under any circumstances.

## 1.2. Software Requirements

Currently, GPMagnet is available for **Linux 64-bit** systems (tested on Ubuntu 10.04 LTS, Ubuntu 12.04 LTS, Ubuntu 14.04 LTS, Fedora Core 13, Fedora Core 14, Fedora Core 16, CentOS 6.0, Debian 6.0, Linux-Mint Debian 2011, Mandriva 2011 and OpenSUSE 12) and **Windows 64-bits** systems (tested on Windows Vista, Windows 7, Windows 8 and Windows Server 2008). Support for other systems is coming soon.

You must have [ffmpeg](http://ffmpeg.org/)<sup>3</sup> installed, together with its libraries and codecs, to make videos of the graphs obtained with the post processing tool. The Windows version includes the ffmpeg executable, although you will need to have the appropriate codecs installed. For the Linux version, you have to install ffmpeg and codecs from the system repository.

Of course, you must have installed the [NVIDIA Driver](http://www.nvidia.es/page/drivers.html)<sup>4</sup> with CUDA support. We recommend using always the latest version of the driver. We also recommend setting your system's GPUs as "**Exclusive Mode**", so that you can only launch a simulation on each GPU at the same time. Such a solution guarantees maximum performances and allows performing the largest-size

<sup>3</sup> <http://ffmpeg.org/>

<sup>4</sup> <http://www.nvidia.es/page/drivers.html>





simulation. Cards can be configured using the command **nvidia-smi**. To show information and status of the GPUs with the nvidia-smi command, is needed at least a 270.x version of the Nvidia driver, so we also recommend to use always the latest version of the driver.