

FileSystem Memory Calculator (FSmem.exe)

Version 1.00

For use with **FSmem.exe** Versions 2.1 and above

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1 Introduction

The FileSystem Memory Calculator is a component of the SafeFLASH file system. You can use it to calculate the memory requirements of a file system implemented in any of the following media:

- RAM driver
- NOR flash driver
- NAND flash driver
- Atmel® DATAflash driver

For each media type, you are asked to supply various parameters which define the system. After doing this, just click **Calculate** to display the space requirements. Depending on the results, you can modify the parameters as required then click **Calculate** again.

The result shows the total space required plus the used space, free space, and reserved/bad space.

The calculator is the file **src/util/FSmem.exe** in the SafeFLASH package, **fs_safe**.

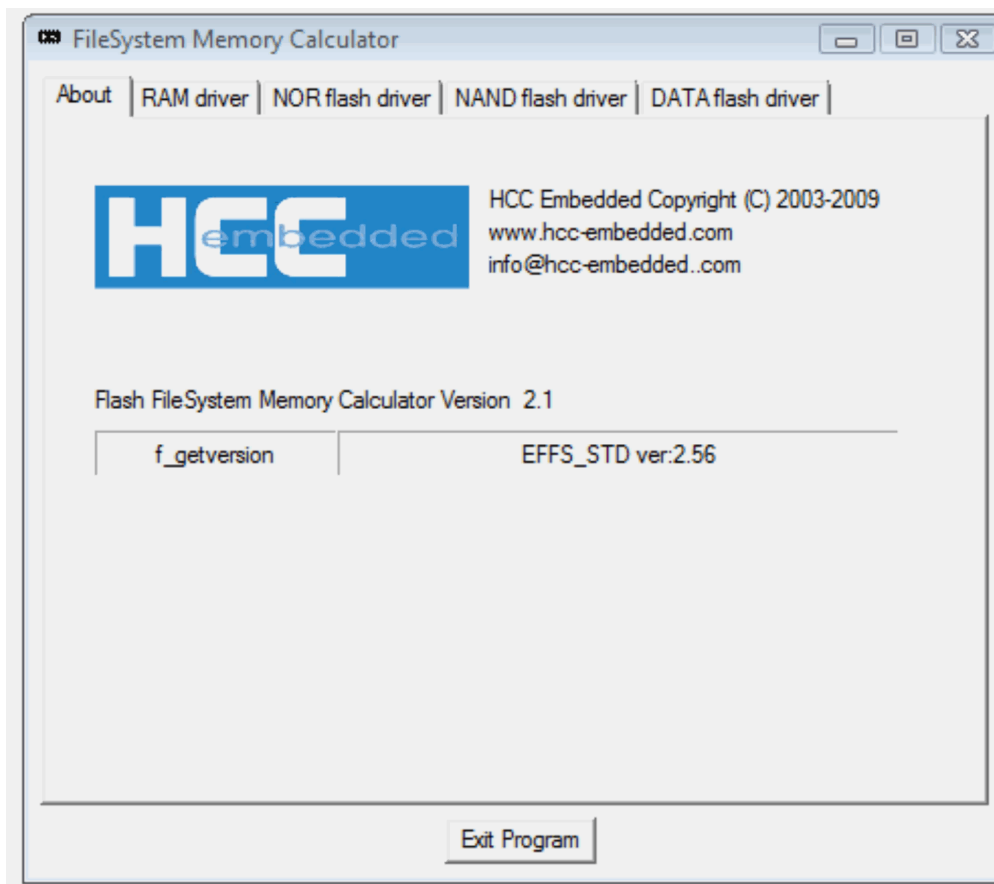
2 Using the Calculator

The pages which follow describe each of the calculator tabs.

2.1 About Tab

The **About** tab is the **FSmem.exe** home tab. It shows the calculator version.

Click on the tab for your media type.



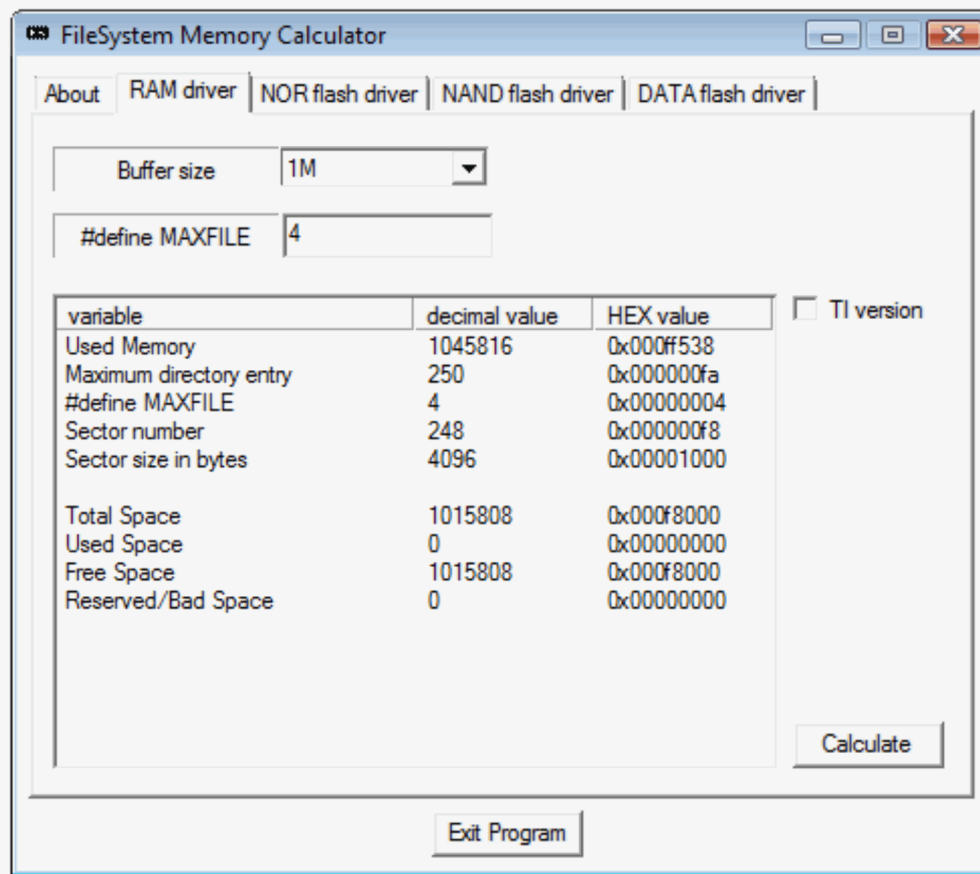
Note: The SafeFLASH file system was originally known as EFFS_STD. The reference to EFFS_STD refers to this original name.

Click **Exit Program** when you have finished with the calculator.

2.2 RAM Driver tab

Use the **RAM driver** tab to calculate parameters for a RAM driver file system. Do the following:

1. Enter the following parameters:
 - *Buffer size* – the size of the buffer. Select a value from those listed.
 - *#define MAXFILE* – the MAXFILE definition from the file **ramdrv_s.c**. This determines the number of files that can be opened simultaneously on the volume.
2. Select **TI version** if you want to use the TI version of RAM drive.
3. Click **Calculate**. The results are displayed as shown below:

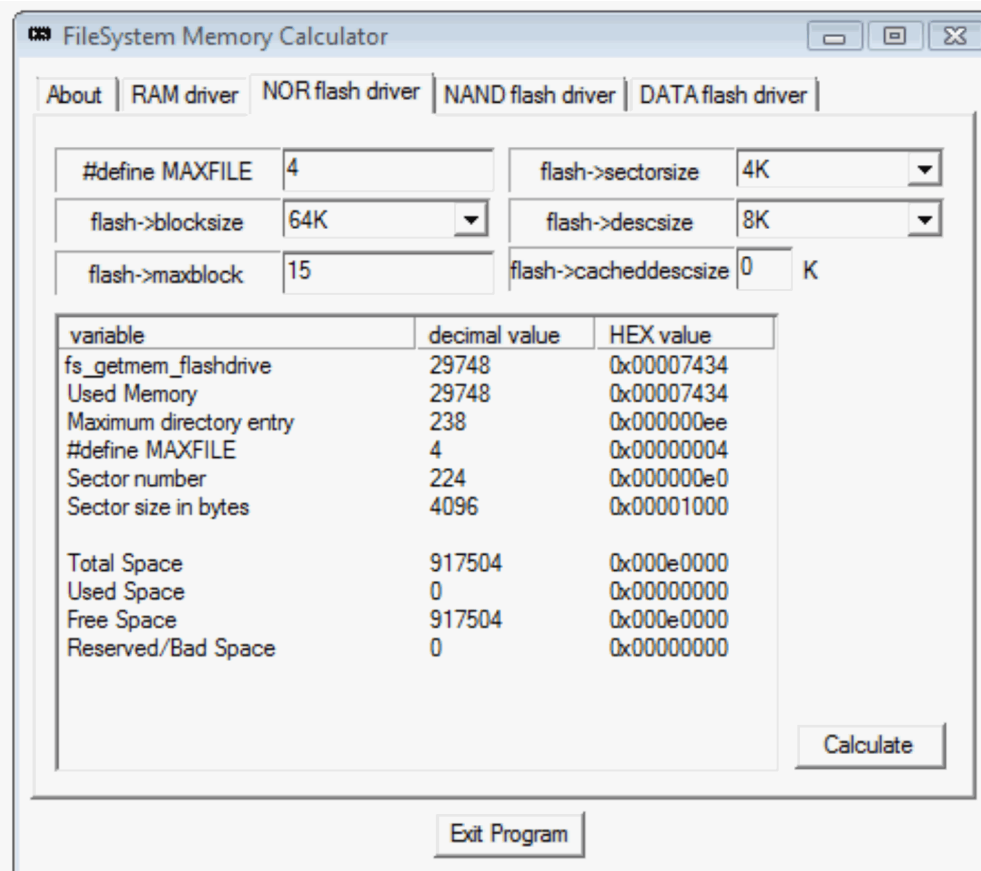


4. Make any required changes and click **Calculate** again. You can repeat this as many times as required.

2.3 NOR Flash Driver Tab

Use the **NOR flash driver** tab to calculate parameters for a NOR flash driver file system. Where there is a list adjacent to a parameter, select a value from those listed. Do the following:

1. Enter the following parameters:
 - *#define MAXFILE* – the MAXFILE definition from the file **flashdrv.c**. This sets the number of files that can be open simultaneously on the volume.
 - *flash->blocksize* – the physical block size to use in the file storage area. This is an erasable unit of the flash chip. All blocks in the file storage area must be the same size.
 - *flash->maxblock* – the number of erasable blocks that are available for file storage.
 - *flash->sectorsize* – the sector size. Each block is divided into a number of sectors. The sector size is the smallest usable unit in the system so is the minimum file storage area. For best usage of the flash blocks, the sector size must be a power of 2.
 - *flash->descsize* – the size of a descriptor block. This is the maximum size of FAT+directory+block index.
 - *flash->cacheddescsize* – the descriptor write cache size. This number must be less than *descsize*, since the cache is allocated in the descriptor block. If you do not want to use the descriptor write cache, set this to zero.
2. Click **Calculate**. The results are displayed as shown below:

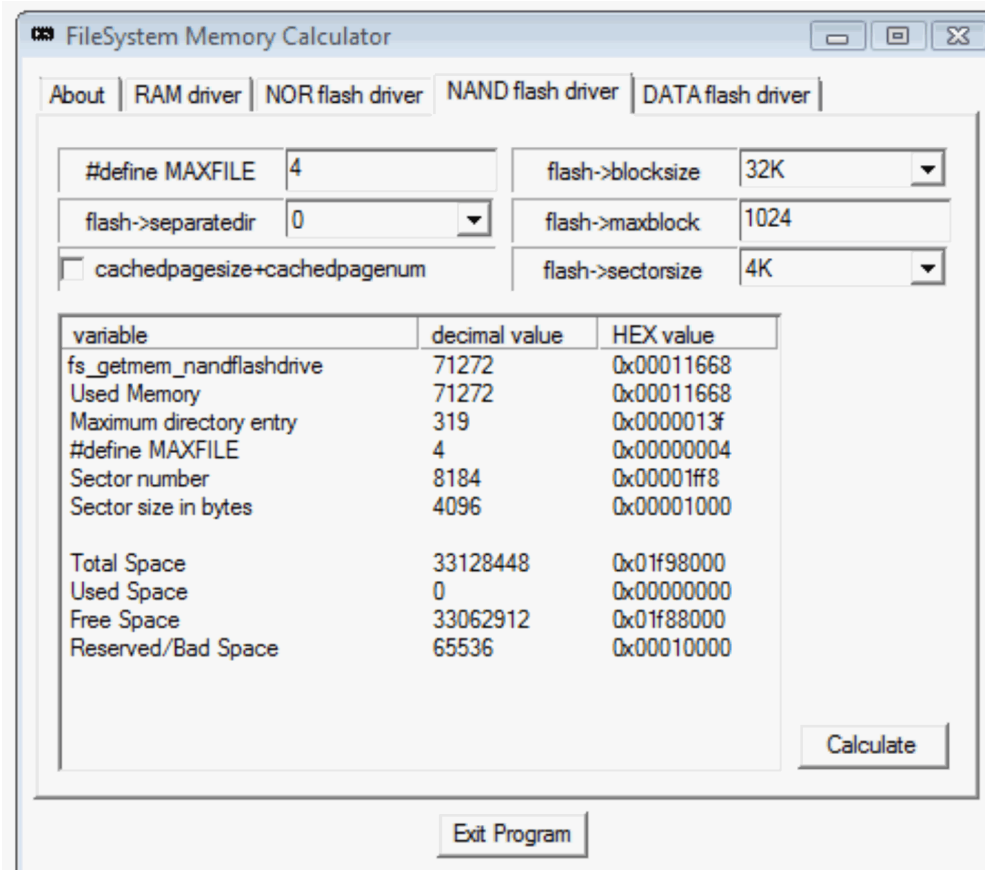


3. Make any required changes and click **Calculate** again. You can repeat this as many times as required.

2.4 NAND Flash Driver Tab

Use the **NAND flash driver** tab to calculate parameters for a NAND flash driver file system. Where there is a list adjacent to a parameter, select a value from those listed. Do the following:

- Enter the following parameters:
 - #define MAXFILE* – the MAXFILE definition from the file **nflshdrv.c**. This sets the number of files that can be open simultaneously on the volume.
 - flash>separatedir* – the maximum number of separate blocks to be allocated for directory entries, a number ranging from 0 to 4. If this is set to a non-zero value, the directory entries are given blocks that are separate from the file system. This allows a much larger number of files to be stored in the file system.
 - cachedpagesize+cachedpagenum* – select this to use the write cache. This means that in most cases only changes to the descriptor block are stored in the flash device, improving the performance of the system (reducing erases and writes), and reducing wear on it.
 - flash>blocksize* – the size of physical block to use in the file storage area. This must be an erasable unit of the flash chip and all the blocks must be the same size.
 - flash>maxblock* – the number of erasable blocks available for file storage.
 - flash>sectorsize* – the sector size. Each block is divided (by 2^n) into a number of sectors. This number is the smallest usable unit in the system so represents the minimum file storage area.
- Click **Calculate**. The results are displayed as shown below:

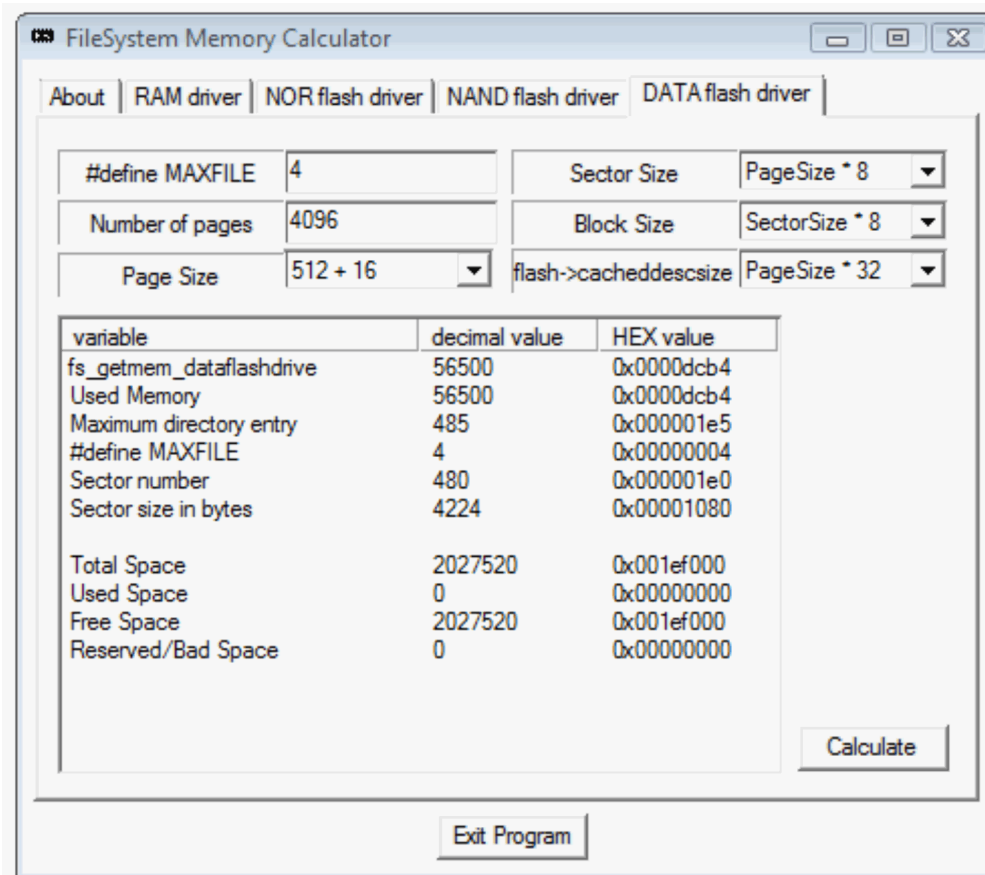


- Make any required changes and click **Calculate** again. You can repeat this as many times as required.

2.5 DATAflash Driver Tab

Use the **DATAflash driver** tab to calculate parameters for an Atmel® DATAflash driver file system. Where there is a list adjacent to a parameter, select a value from those listed. Do the following:

1. Enter the following parameters:
 - *#define MAXFILE* – the MAXFILE definition from the file **dfdrv_s.c** that sets the number of files that can be opened simultaneously on the volume.
 - *Number of pages* – the number of pages in the flash memory.
 - *Page size* – the page size.
 - *Sector Size* – the logical sector size. Each block is divided into a number of sectors. The sector size is the smallest usable unit in the system so represents the minimum file storage area.
 - *Block Size* – the size of logical block to use in the file storage area. This is an erasable unit of the flash chip and all blocks in the file storage area must be the same size.
 - *flash->cacheddescsize* – the descriptor write cache size. If you do not want to use the descriptor write cache, set this to zero.
2. Click **Calculate**. The results are displayed as shown below:



3. Make any required changes and click **Calculate** again. You can repeat this as many times as required.