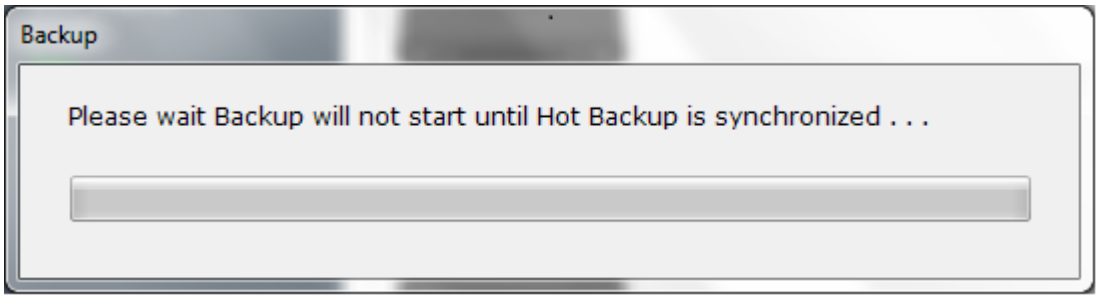
Hot Backup and Recovery Manager

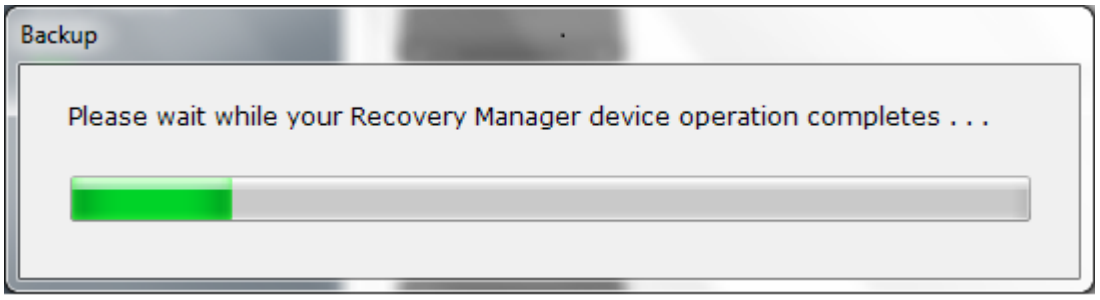
Flash2GUI has been rebranded as Recovery Manager for Hot Backup. Only Recovery Manager (not Flash2GUI) can be used for Hot Backup.

Unlike Flash2GUI, Recovery Manager does not take the drive offline during a Backup. Instead it requests that the SF takes CF backup card writes offline when the drive/backup card(s) are synchronised.

When Recovery Manager is doing a Backup but the drive/backup card(s) are not synchronised the following new progress screen is seen:



When the backup CF card is synchronized with the drive CF card the SF will take backup card writes offline in response to the request from Recovery Manager. Recovery Manager polls the SF until the returned status indicates that backup card writes are offline. The Backup then proceeds and the usual progress screen is seen:



Solid State Disks Ltd
Creative House, Station Road
Theale RG7 4PD United Kingdom
P: + 44 (0) 1189 323499
www.solidstatedisks.com
Reg. No. 06474031
VAT No 932 0970 32

When the Backup is complete, Recovery Manager tells the SF to resume backup card writes. If an error occurred during the Backup (e.g. Recovery Manager was closed or the Ethernet connection was lost) the SF has a timer to put backup card writes online again after an absence of Ethernet traffic of about three and a half minutes.

Normally the drive is always online. It is only offline if a Restore is being done or the user has used the Take Offline button.

Either a SF2 single CF card system or a dual CF card system can be used.

Hot backup uses CF card sectors above the drive space. Therefore, the CF card needs to be large enough for the emulated drive size (if not a suitable custom size must be set).

For a single CF card system (drive and backup on the same CF card), the CF card must be at least double the drive size plus 0.025%

For a dual CF card system (drive and backup on different CF cards), the CF card must be at least the drive size plus 0.025%

As CF card capacity will shrink as the card eventually wears, an additional margin of at least 10% of the drive size is recommended.

The backup CF card is in the top slot of a dual system, the bottom slot is the drive card.

If drive size is set to 'CF card size' (the drive is set to use the entire card) then the SF will turn hot backup off. The drive will work, but no backup is possible.

In a later release Recovery Manager will check the drive configuration to ensure there is enough CF card space for Hot Backup. If the configuration is not valid a pop-up screen is to inform the user. This is not currently implemented. Therefore, care needs to be taken to ensure that the CF card size is large enough.

Hot backup has two sync modes. A background forced sync mode (all sectors eventually updated) and a background update sector sync mode. These two modes will be referred to as forced sync and update sync. Update sector mode is the normal mode of operation.

A Recovery Manager Restore should initially be done. This will update the drive card and will also result in a forced sync being done to the backup card. During the sync process the drive can still be used (a log of changed sectors is maintained on the drive CF card, one bit per sector). When a forced sync is complete hot backup will use the update sector mode.

If using a new backup card in a dual card system a forced sync must be done by pressing the button associated with the backup card (the left most button) three times or more within 6 seconds. The forced sync mode will be indicated by fast flashing of both backup card LEDs for four seconds.

Previously if an unused card was inserted into the backup slot the system would detect this and automatically do a forced sync. However, the software to do this has currently been disabled, so user intervention is always needed (three button presses or more within 6 seconds).

Before removing a backup card in a dual card system, the LED associated with the backup card must be steady green (synched). If the button associated with the backup card (the left most button) is pressed while the LED is steady green (synched), the green LED will change to fast flashing mode. This indicates that writes to the backup card are offline, system information has been written to the cards and that the backup card can be removed. If the backup card is not removed within 30 seconds a timeout occurs. The LED will no longer flash and writes to the backup card will be online again.

At present more work needs to be done for card pairing (using system information) in a dual card system. Hence if a new backup card is inserted the user needs to press the left most button three or more times within a 6 second period to initiate a forced sync.

If hot backup is synchronised and no further host writes have occurred, there is no need for hot backup to read the drive CF card. This reduces CF card wear.

Currently Recovery Manager licensing is the same as Flash2GUI. Eventually different licenses need to be implemented.

The ASM version of Recovery Manager still has a tick box for 'Drive stays online during Backup'. This must be unticked. This feature will be removed in a later version of Recovery Manager. Presumably though the Solid State Disks version of Recovery Manager would be used for a demonstration.

It should be noted that three parameters for hot backup are stored in SF EEPROM. The values can be changed via the UART command line interface or Ethernet (although not currently implemented for Recovery Manager). The commands are:

1) hbguard
2) hbidle
3) hbsectors

The hbguard command has a range of 1 to 65535. Each unit represents 10mS. The default value is 1000 which represents 10 seconds. hbguard is used for a guard timer to check that no further host writes have occurred after the backup has become synchronised. If no further host writes occurred during the time period then hot backup is synchronised and the LED for the backup CF card is lit steady green.

The hbidle command has a range of 1 to 65535. Each unit represents 10mS. The default value is 5 which represents 50mS. hbidle is used for a host idle timer to determine when hot backup runs. If not idle and no host read or write occurs within the period, then idle mode is entered. When idle hot backup updates for the backup card can occur. If idle and the host does not read or write then hot backup updates continue. If the host reads or writes it is not idle, the idle timer is reset and the backup card will not be updated until the idle condition is met.

The hbsectors command has a range of 1 to 255. Each unit represents one sector. The default value is 1. hbsectors is the number of hot backup sectors written to the backup card each time around the main program loop when the host is idle (see hbidle). Increasing hbsectors reduces the time needed for both forced and update sync modes (particularly for update sync mode), but may reduce host drive speed depending on the hbidle setting.

The hbguard, hbidle and hbsectors settings could be optimised for a particular system.

Recovery Manager has its own desktop shortcut and path e.g.
C:\Program Files\Solid State Disks\Recovery Manager

However, at present if Flash2GUI is already installed it has to be uninstalled, otherwise Recovery Manager will not install (a message 'The same or newer version of this product is already installed' appears during installation). Also, installing Flash2GUI will uninstall Recovery Manager.