

Savgame manager V0.3

A tool by Pokedoc.

1. Introduction

Thank you for your interest in this tool!

Savegame Manager is a homebrew tool designed to backup and restore saves from retail game cartridges for the Nintendo DS. It is very similar to the popular Rudolph tools for backing up and restoring saves, however with a few differences:

- Supports some problematic games with exotic hardware.
- Supports multiple backup methods in one tool: 3in1 (DS saves), WiFi/FTP (DS saves), GBA (GBA saves, no EEPROM-type saves), Slot 2 (DS saves)
- Completely open source (GPL V2), should Nintendo change something, the program can be easily updated without having to reinvent the wheel
- This tool does NOT support ROM dumping. It will never do. Any requests for ROM dumping support will be IGNORED!
- This program does **not** work on the Dsi or the 3DS. You **do need** a real DS phat/Lite. The newer models did change something with the hardware; you might need a System Menu/NOR hack to get it working. Since I do not have this hack, I can't test it.

1.1 Supported games

As of now, this program supports more than 99% of all known DS games. If your game was supported by Rudolph's tools, it should be supported by this program as well. In addition, the program supports the following games with exotic hardware:

Games with infrared device:

- Walk with Me/Personal Trainer: Walking/Laufrythmus DS (that Pedometer game)
- Pokemon HeartGold/SoulSilver/Black/White

The following games are **not** supported (and will not until somebody figures out how to access this hardware, and adds it to the code):

Games with large saves:

- Band Brothers DX/Jam with the Band
- WarioWare: DIY

A hacker named Deufeufeu did write a tool that is rumored to work with this hardware, but he never released the source for it.

Games with a Bluetooth device:

- Pokemon Typing DS (ships with a Bluetooth keyboard)

This game is quite new, so no one knows enough to understand it. And many people believe it will never be released outside of Japan, so don't count on a quick solution.

1.2 Known issues

As it turned out during the testing phase, several flash cards exhibit a weird behaviour, interfering with this program. What follows is a list of known issues with specific flash cards. If your card is not on this list, then everything should work (or no one has tested it on your card yet).

Action Replay Media Edition/DSi: The homebrew does **not** work on the AR DSi out-of-the-box. You may need to manually apply a DLDI patch. I have finally bought an AR DSi myself, but it seems to be the version that does not allow homebrew, so I can't help you, sorry. (And I am not going to buy another one, product descriptions are horribly inaccurate when it comes to different hardware revisions.)

Various R4 clones: There are more R4 clones out there than anybody can count, some of which have various issues. I have taken great care to fix pretty much everything that can possibly go wrong, but I can not testify that it will work on your hardware. Maybe you need to manually apply a DLDI patch. If you can't get it to work somehow, you are out of luck, sorry.

1.2 Work in Progress

Right now, I have added everything I know how to do. I still intend to improve the program, but unless I find some piece of new information on specific hardware issues, development has stopped.

I have finally activated the corresponding sections on the Google Code project page (see section 7), so you can submit fixes/hints/patches/translations should you desire so. I will also fix bugs that can be fixed.

And finally, if the DSi should ever be opened more than it is right now, I fully intend to return and write a fully-blown DSi mode. (I would not count on it being done fast, though – the DSi support will eventually be developed by different people.)

1.3 Translations

The program now allows translating most messages. Just have a look into the "lang" folder, where you find all translations currently available, as well as a template file you can use to write your own translations. The process is very easy, it is just an ini-type text file with several strings. The file is quite heavily commented, so you should be able to understand the context in which the strings appear. You do not need to worry about too long lines, the program adds linebreaks whenever required. You can add manual linebreaks, though.

2. Setting everything up

This tool does NOT work on the DSi/XL/3DS! No one seems to know how to fix this. (See section 4.1 if you can help with this.)

Copy the "savegame_manager.nds" file to a convenient place on your microSD-card. Copy the "savegame_manager.ini" file into the root folder of your microSD-card. (You can also try to copy it into the same folder as the nds file; it depends on your Flash Card if this works. If you get an error message claiming that your ini file was not found, it does not work, and you need to move it to the root folder.)

The program now supports **translating** the messages. Look into the "lang" folder for a premade string file, or write your own (this should be based on template.ini). Uncomment the "language" option in the ini file and point it to where you copied the language file. If you don't use this option, the program will use hardcoded strings (english).

If you get a "**DLDI error**" on start, your flash card is ancient and/or does not support auto-DLDI patching (because the program does not find your microSD-card). You will need to patch the

program by hand, following the instructions in section 2.1

Setting up the rest depends on the backup mode you want to use:

- If you are running this program on a DSi/XL in DSi-mode (currently only the Cyclops iEvolution supports this), you will get an error message that the program does not work in this mode.
- If you are using a **known** DLDI driver for a Slot 2 Flash Card, the program will enter Slot 2 mode. If you want to use Slot 2 mode, but your Slot 2 device is not detected, it usually is a sign that your Slot 1 Flash Card overwrote the DLDI driver with its own. See section 2.1 how to disable this. If your Slot 2 card still is not detected, you can add the line "slot2 = 1" in your ini file. If you get a false positive, i.e. Slot 2 mode triggers while it should not, use "slot2 = 0" instead. Otherwise, you can leave this line out.
- If you have an EZFlash 3in1 inserted in Slot 2, the program will enter 3in1 mode. See section 2.2 how to set this up. Warning: If you have an EZFlash IV inserted in Slot 2, it may also detect as a "3in1". Do **not** use this mode – it will delete the firmware on your IV!
- If you have a GBA module inserted in Slot 2, the program will enter GBA mode. See section 2.3 for notes on this mode.
- If none of the above is valid, the program will enter WiFi/FTP mode. See section 2.4 how to set this up.

2.1 Setting up DLDI

If you get a "DLDI error", you need to patch your flash card manually. (This needs to be done only once.) Go to

http://dldi.drunkencoders.com/index.php?title=DLDI_Right_Click

and download the program from the link at the bottom of the page. Install it (you will need to identify your card), and you can apply DLDI patches from the context menu (right-click)

Some hardware may be problematic, and the DLDI driver may not be easy to identify. The following issues are known.

Action Replay DSi: This hardware seems to require a manual DLDI driver patch. Unfortunately, I was unable to find working instructions how to find the correct driver, when it works, or what to do if it still does not work. There are mixed reports of success; if Datel changed the hardware on their device without releasing a new DLDI driver, you are out of luck. And it will still not work on the DSi!

Various R4 clones: There are more R4 clones out there than you can count with two hands. Each of them may have different approaches to the DLDI problem. In some cases, you may need to patch your card manually. And other issues may emerge as well. In a nutshell: If you can somehow make it work, congratulations. Otherwise, I strongly suggest to get a better card. (There are cheap non-R4 cards out there.)

Other cards also are cloned on a less regular base. If you can get it to run, good. If not, bad luck.

2.2 Setting up 3in1 mode

The EZFlash 3in1 is a piece of hardware manufactured by Team EZFlash that serves as a memory expansion, rumble pack and GBA flash card, which is supported by pretty much every Slot 1 flash card out there.

Other than keeping the 3in1 in Slot 2, you don't need any additional work to set everything up. As of V0.2.4, it work even if your 3in1 SRAM battery is dry. To backup/restore your save, select one of the options on the lower screen, and follow the instructions.

2.3 Setting up GBA mode

There should be nothing to set up here. Please keep in mind that "EEPROM"-type saves are not supported yet, since there is no documentation how to access this type on the DS. BATEK claims it can't be done. Rudolphs GBA backup tool (0.2+) supports it anyway, but it is closed source. If you can help, please see section 4.

2.4 Setting up WiFi mode

Okay, this may be a little bit complicated. You will need to set up two things: a compatible **wireless access point**, and an **FTP server** running on a computer behind your access point. (This only needs to be done once.)

2.4.1 The FTP server

An FTP server provides a directory on your PC where you can store and retrieve data from any compatible FTP client. The homebrew implements a very rudimentary FTP client, mostly tailored to the compact FTP server smallftpd. Other FTP servers may or may not work. I strongly suggest that you use this server, though: it is free, non-intrusive (delete the directory, and it should be gone for good), and it works with the homebrew.

Windows XP: smallftpd. Download and unpack smallftpd-1.0.3-fix (Google is your friend). Double-click on the file "smallftpd.exe", and open "Settings/General". Take note of the **FTP port** (should be 21). Next, open "Settings/Advanced" and **tick the box** "Use local IP". Finally, open "Settings/Users". Click "Add", and enter a **username** into the box "Login" and a **password** into the box "password". Finally, click the button "Add" next to the "Directories" field. Leave "virtual path" as is, and **select a directory** in "physical path". This is where your saves will go on your computer. Finally, click "add" next to the "Permissions" field, and **make sure that the "permissions" field says "LRW"**, or you will not be able to dump your files.

After starting the program, you will need to press the yellow "play" button to start the server (or you can tick the "autostart" box in the basic settings).

Other FTP servers will be added as a working set of parameters has been found out.

Next, open the savegame_manager.ini file and edit the following fields (enter the same values you entered in the FTP server):

ftp_user = **username**

ftp_pass = **password**

ftp_port = **FTP port**

The fourth entry will be found in the next section.

Other FTP servers will be added as a working set of parameters has been found out.

2.4.2 The access point

The access point (AP) is where your DS logs in to connect to your computer. **You will need an AP with "insecure" settings**, since the DS can only do WEP encryption (which is insecure). If you got a wireless AP from your internet provider, you may not want to disable encryption, opening your network to hackers. Instead, you can opt to buy a cheap USB WiFi stick and transform it into a wireless access point. **Do not buy any USB stick, you need a specific "chipset" for this to work!**

The manufacturer Ralink is offering drivers for all Ralink-based USB sticks that allows to run the device in SoftAP mode (which is what you want). Unfortunately, Ralink is not selling its devices using their own name; instead, you need to find a device which happens to be running with a Ralink

chipset. Practically no stick advertises this (and most manufacturers use "crippled" drivers which offer NO SoftAP mode). You will need to use Google and a small amount of guesswork to find a compatible device. (Some online traders may even send you a "compatible"/"comparable" product, which might use a wrong chipset.)

Known brands which **often** use the correct chipset include Hama, ... (more will be added as it is discovered).

After you found a compatible chipset, you can download a driver from the Ralink web site. Insert the stick, right-click on the "Rx" icon which should have appeared in your systray, next to your clock, and select "switch to AP mode". After some time, a cofig window should pop up. Select an SSID (a name) for your AP (e.g. "NDS"), and make sure that your SSID is **not hidden**.

From this point, all you need is to plug your WiFi stick in your PC to connect to your DS, and remove it later.

Now, start any game that uses the wireless connection on your DS, and elect the "configure Nintendo WiFi connection" on the title screen. Set up a connection to the WiFi SoftAP which you just configured; if the test connection works, your DS is now ready to connect to the FTP server.

Now you only need to discover the IP address of your computer. On Windows, press "Start/Control Panel", and in the opening window "Network and Internet Connections/Network Connections". You will now see a list of network connections on your computer. Select one connection that has no red "x", and figure out your **IP address** (using right-click / "Properties", or the properties settings in the left info bar). If you see multiple IP addresses, it is not always trivial to get the correct one; just keep trying until you find one that works. (If the program complains about not finding an FTP server, you probably got a wrong address.)

And now, everything should be set up. For future use, just plug in the USB stick, and the rest **should** work automatically on any Windows from XP onwards. (On Vista/7, you may need to tweak something with your Firewall or other settings. I am still running XP, so I don't know what might go wrong. My experience tells me that something will go wrong, though.)

2.4.3 Link quality

The WiFi link quality can vary depending on your distance to your access point, the load of your PC, or the current humidity (yes, it can be **that** bad). The program will take considerable effort to get everything to/from your WiFi server, but under some circumstances, it is just **slow**. You will get a warning if your connection is slow, but in general, the save data will make it to your DS. However, interruptions of a few seconds are possible, in this case, just try to get closer to your access point. (If nothing happens after about one minute, though, you better restart the program and retry.)

2.5 Setting up Slot 2 mode

To use Slot 2 mode, you need a Slot 2 DLDI-capable flash card. Track down the DLDI driver for the Slot 2 card (**not** your Slot 1 card!) and manually apply this driver to the nds file. See section 2.1 for details.

After this, you must prevent your Flash Card from DLDI patching the program by itself. How this is done varies between cards (on the Cyclops DS, press "select" when booting). Some cards do not support disabling DLDI at all, so you may need to apply an additional "no DLDI" patch as well, after you added the Slot 2 DLDI driver.

After these preparations, the program should be able to read from and write to Slot 2. Tested and verified working with an EZFlash IV miniSD.

NOTE: You may need to copy your ini/language file to the Slot 2 card.

3. Using the homebrew

No matter which mode the program is running in, the usage of the program is very similar. You will get a choice of three options on the lower screen: "Backup", "Restore" and "Delete". The first two options are for dumping your save or writing a save back to your retail cartridge.

3.1 Backup

First, you will be prompted to remove your flash card and replace it with a retail game cartridge. The program will identify the retail cartridge and the save chip (plus the infrared device, if you are using a Pokemon game).

In 3in1 mode, the save will now be written to your 3in1, and you will be prompted to reboot your DS and restart the program. Other backup model will directly continue to the following part.

You will now need to select an existing file to overwrite, or press (L+R) if you want to write a new file without overwriting anything. In FTP mode, it will take a few seconds to present you the existing files in your target directory.

If you selected a new file, the program will now search for an unused filename based on the game title. After finding the new filename, the save will be dumped. How long this takes depends on the save size and the backup path. (FTP, in general, is slower than other options.)

3.2 Restore

Restoring a save is easier than dumping it. You will first be prompted to select a filename, and then, this filename will be loaded into memory. Then you will be asked to replace the flash card with a target game cartridge. And finally, the save will be restored.

3.3 Delete

It is very likely that you will never need this. It will delete your save WITHOUT BACKUP, your cartridge will be reset as if you had just bought it. This might be useful to reset some once-per-cartridge features (e.g. Manaphy Eggs on Pokemon Ranger).

For your own safety, this option is protected by multiple warnings and a quite unintuitive button combination.

4. Help Wanted

Yes, you can help developing this tool. There are several points that do not work yet, mainly due to a lack of knowledge of some details on the DS. If you know how to do any of the following things, feel free to contact me (www.projectpokemon.org, username: Pokedoc). Or you can contact me via my Google Code page (<http://code.google.com/p/savegame-manager/>).

Right now, I need help with the following points:

- **DSi Slot 1 access.** After removing the cartridge in Slot 1 and inserting anything else, it is no longer possible to access the game cartridge, and therefore, the game save. This might be related to the DSi not restoring power to Slot 1 after switching a cartridge. The System Menu does manually restore the power, so it should work from a System Menu-level exploit (which has not been found yet, and which may not even exist).
- **DSi SD-slot access.** According to the current state of knowledge, the SD slot is locked out after anything runs from Slot 1, including flash cards. Maybe it is possible to unlock it, but no one knows how.
- **DSi WPA encryption.** The DSi supports WPA encryption in hardware, and (as you may have

guessed), no one seems to have cracked it yet. WiFi seems to be locked out on the iEvolution, though.

- **GBA EEPROM backup.** GBATEK claims it can't be done, Rudolph demonstrated that it can be done. But he told no one **how** it can be done. So, if you happen to know how to reach the save on EEPROM-type GBA cartridges, please share this knowledge so that the GBA mode can be finished.

- **Band Brothers DX/Large Save support:** There are a handful of games out there which use big save files (8 MB+). This hardware seems to require a different strategy to read/write, and a tool used to access these saves exists (written by deufeufeu), but it is closed source (plus his home page seems to be dead).

- **Pokemon Typing DS/Bluetooth support:** This is a typing game released in Japan, supposed to teach children how to use a keyboard. This Keyboard is accessed using a Bluetooth device found on the game cartridge, which seems to interfere with the standard backup mechanism. Since this game was never released outside of Japan, I have no way to verify if it works, or to hack something up to make it work. If you have additional information, please share it so I can add it.

5. FAQs

Q: Is it safe?

A: It should be. I have put considerable amount of work in the program to prevent saves from being deleted, and pretty much everything is double-checked before anything is done to your retail cartridge. In FTP mode, the entire save is loaded from the server before your save is touched, so if your wireless connection should die at the wrong point, your game will remain safe.

Q: I am getting a zero-sized save size!

A: Ah, this means that Nintendo is using a new save chip, which is not known to the homebrew yet. If your game cartridge is identified as "Flash (ID:*id*)", you can fix this easily by taking the id given there and tracking down the capacity of this device. In this case, uncomment the lines in the "[new chips]" section in your ini section, add the ID and the dual logarithm of the device capacity. (This means that the capacity is "2^n bytes", and you need the "n".)

Q: *insert game name* is not recognised!

A: This means that Nintendo decided to introduce something new. See section 1.1 for a list of unsupported games with exotic hardware; you probably have one of these games.

Q: I can't dump saves using WiFi!

A: Make sure that you have WRITE access on your FTP server. Smallftpd only gives you read access by default.

6. Acknowledgements

Many thanks to everybody who contributed to this development, either directly or indirectly. If you believe that your name should appear here, just contact me.

- Thomas Pfau, for his compact FTP library not depending on OS-specific functions
- Simon White, for his ini-parsing library which does not have special dependencies

- Everybody at projectpokemon.org who was willing to beta-test this software.
- Everybody who has ever contributed on devkitpro. Keep up that good work!

7. Contacting me

You can reach me via a PM at the ProjectPokemon forums (www.projectpokemon.org, username: Pokedoc), or via my Google Code page (<http://code.google.com/p/savegame-manager/>). Due to a rather stressful Real Life, I can't promise you a fast answer, but I promise will address every request eventually.

Appendix

This is a happy collection of things that do not fit anywhere else.

Some notes on DSi mode. The DSi has a much improved security concept; it is able to switch off almost every piece of hardware separately. Therefore, even if you find an exploit that lets you run homebrew, chances are good that you can not use everything that is available. In fact, this is why you don't have WiFi/SD-slot access on the Cyclops iEvolution – the cooking game used for this exploit does not need WiFi or the SD-slot, and therefore, it is switched off. On the other side, no DSiWare exploit (Sudoku) is able to access Slot-1, and therefore your saves, since Sudoku does not need access to Slot-1. In a nutshell: only the System Menu has access to everything, so we would need a System Menu-level exploit to run this program on a DSi.

Unfinished work. If you download and have a look at the source code, you will see some "dead ends", aka stuff I tried to get working but failed. I have left almost everything in just so that somebody else can try his/her luck. This includes some bits of a Download Play mode, which was supposed to get this program on a DSi, but it did not work because it only works on an old DS Phat with a patched Firmware. It was fixed before the DS Lite was released, and with the advent of Flash cards, this homebrew launching mechanism was discontinued.