

MemCard^{PRO}_{GC}



8BitMods

User Manual

First Edition



FPGA
Technology Inside



Requires a
microSD card



WiFi and
Connected Features

INTRODUCTION

The MemCard PRO GC is a modern reimplementaion of the original Memory Cards for the GameCube console.

By utilising FPGA technology and a dual-core 240MHz microcontroller, it is able to provide mass storage through a microSD card or USB interface to the Memory Card slot of your console. This allows the card to create an extraordinary amount of Virtual Memory Cards (VMCs) for your games.

On top of that, it is able to connect to your local wireless network, and provide more features through an intuitive Web User Interface (WebUI).

Finally, it implements a proprietary set of commands that allows other devices and peripherals, like optical drive emulators or Swiss, to communicate with the card, for automated card switching and game detection.

With the MemCard PRO GC you can forget about stacks of Memory Cards, and running out of storage space at the most crucial moment of your gaming experience.

INITIAL SETUP

The MemCard PRO GC requires a formatted microSD card in order to work. Any microSD card rated Class 4 and above will work, from 1GB to 2TB. Each gigabyte of storage space amounts to approximately 2048 VMCs, each with 59 blocks of storage space. You can also configure the default block size of your VMCs with all options available up to 1019 blocks.

To prepare your microSD card, you will need a computer and a microSD card reader (or a full size SD card reader with a microSD to SD card adapter).

Download the official "SD Card Formatter" software from the SD Card Association: <https://www.sdcard.org/downloads/formatter/>

Run the formatter and select your SD card. Select "Quick Format" and give it a "Volume Label" if you'd like. Press the "Format" button.

You will also require the MemCard PRO GC latest firmware and operating system. You can download the file from the following link: https://install.appcenter.ms/orgs/beta-ucu9/apps/memcardprogcdistribution_groups/public

Once you download your file, extract its contents to the newly-formatted microSD card. You should have two new items in the root folder of your card:

- mcp2gc.bin (file)
- os (folder)

Safely-eject your microSD card from your computer and plug it into the microSD card slot of your MemCard PRO GC.

If you prefer to use a USB storage device, please make sure that you either use a low-power device such as a flash drive, or if you use an external SSD or Hard Disk, make sure this is powered externally, as the console's power supply will not be enough.

Make sure you format your drive with a simple MBR partition scheme and FAT32 or exFat file system. Then you can prepare the files in the same way as described above for the sd card.

Please Note: if you decide to replace the microSD card or USB device on your MemCard PRO GC, you will need to repeat the instructions on this page for the new microSD card or USB device..

You can now plug the MemCard PRO GC in to either slot of your GameCube or Wii console.

*Wii support only works for GameCube games. GameID is not currently supported.

Basic usage

1. Plug your card in to Slot 1 or Slot 2 of your GameCube or Wii console.
2. Power up your console. The logos "8BITMODS.COM" and "MemCard PRO GC" will appear on the OLED display in this order.
3. The MemCard PRO GC will then load a VMC and display its name on the display. The first time you power up the card, "MemoryCard1" will be created on your storage device, and it will be loaded and displayed on the MemCard PRO GC OLED display (see fig. 1).
4. As soon as your game launches, it will detect the Memory Card. In-game usage is the same as a normal Memory Card, which means you can save and load games as you'd normally do.
5. Each Virtual Memory Card provides 8 channels of extra virtual cards. You can think of each channel as an extra whole memory card that you can use in your games. Each channel will provide storage for the preconfigured default amount of blocks.
6. You can switch channels using the buttons on the device, or through the WebUI. Most games support memory card hot-swapping, and MemCard PRO GC simulates the hot-swapping action every time you change a Channel or VMC.
7. To go to the next channel, you can press the right physical button on the MemCard PRO GC, or through the WebUI.





Fig. 1: The display during normal operation, showing the status icons at the top, loaded VMC name in the middle row and GameID and selected channel at the bottom row.




8. To go to the previous channel, you can press the left physical button on the MemCard PRO GC or through the WebUI.
9. In order to cycle through the available Virtual Memory Cards, press and hold the right physical button on the device. The next VMC will be loaded.

Display Icons:

The OLED display of the MemCard PRO GC has a row of status icons that depict the current status and activity. These are, from the left:

-  **Console activity:** When this icon animates, the MemCard PRO GC is actively exchanging data with the console.
-  **Storage Device Activity:** Depending on the storage device you've connected to the MemCard PRO GC, this will either display an "SD" icon or a "USB" icon. When this icon flashes, the MemCard PRO GC is actively writing data to the device. Make sure you don't power off or disconnect the device to prevent data loss.

Display Icons (cont.)

- **Wireless Network:** This icon can show the current status of the WiFi transceiver on the Memcard PRO GC. There are a few different icons that can be displayed here:
 -  : The WiFi Radio is currently off. Press and hold both buttons on the device to enable WiFi Access Point Mode.
 -  : The WiFi is on and is actively transmitting an Access Point. You can connect to it to start the WiFi setup wizard (page 7).
 -  : The WiFi radio is connected to your local WiFi network. The solid bars indicate the connection strength to your router.
- **32M | VMC Size:** The last icon displays the size of the mounted VMC file in Megabits (1 Megabit = 125 Kilobytes). The possible values are 4M, 8M, 16M, 32M and 64M (59, 123, 251, 507 or 1019 Blocks).

Using with Swiss (GameID)

The MemCard PRO GC implements a proprietary communication protocol, that allows Swiss to send the unique Game ID that is being launched to the card. This allows the MemCard PRO GC to identify which game is being launched, and automatically create a VMC for that specific game. If the VMC already exists, it will mount it, making it easy to forget about switching to the right VMC that has your game saves for that specific game.

Furthermore, it allows the MemCard PRO GC to make use of its internal game database, and show the full name of the game you are playing.

You don't need to do anything to enable this functionality. It is enabled by default, when a game is launched via Swiss, from any storage method. Original DVDs, SD2SP2, GCLoader etc. are all supported by default.

While every effort has been made to add all known games to the database, some may still be missing. If you find a game that shows the GameID instead of a full name on the display, please let us know, and we will add it with a firmware update.

Limitations & Exceptions

Known limitations:

- In the case where the MemCard PRO GC cannot determine the GameID of the game being launched, it will revert to the first available generic VMC (MemoryCard1). If you think that the game ID is detected correctly in Swiss, but not detected by the MemCard PRO GC, please reach out to us and we will add it to the database in the next firmware update.
- GameID is only possible when paired with Swiss. The GameID functionality has not been implemented for Wii yet, but we're looking to add support for Wii in the future as well.

WiFi & Remote Features

1. The MemCard PRO GC can connect to your local wireless network and allow you to change its hardware settings and manage the card's state and storage remotely. In order to connect your MemCard PRO to your local wireless network for the first time, please follow the instructions below.
2. With a storage device plugged in and the MemCard PRO connected to your console, power up your console and wait until the MemCard PRO shows the default screen on its display (Fig. 1).
3. Press and hold both buttons on the MemCard PRO GC to activate the Access Point mode.
4. Using a Computer or Mobile device (phone or tablet), bring up the Wireless Networks. You should see a new network available in your area, called "MemCardPRO-(serial number)". Select it to connect to it.
5. Once you select the MemCard PRO GC access point, it will ask you for a password. The password is **mcpadmin**
6. Select OK or Connect. Your device should connect to the MemCard PRO GC access point.
7. Open your default Web Browser, and navigate to the following URL: <http://192.168.4.1>
8. You will be greeted by the WiFi Setup Wizard. Follow the instructions on your screen to complete the setup and connect your MemCard PRO GC to your wireless network.
9. On the final step the device will automatically restart after you click the button. The MemCard PRO GC access point will disappear and your device should connect back to your local wireless network. If this doesn't happen, please manually re-connect to your wireless network.
10. After the card finishes restarting, it should be connected to your wireless network.
11. To access the WebUI, you need to find the MemCard PRO GC's assigned IP address first. Keep an eye on the display of the MemCard PRO GC during boot up. The display will change to show the assigned IP address. Write this down somewhere convenient, and use it to access the WebUI from any device connected to the same network as your MemCard PRO GC.

For example, if your MemCard PRO GC's IP address was "192.168.1.230", open a web browser on a computer or mobile device, and type it in the address bar like "<http://192.168.1.230/>"
12. If you did everything right, you should be looking at the home page of the MemCard PRO GC WebUI.

The WebUI

After setting up the WiFi in the previous chapter, you should now be able to access the WebUI.

The WebUI allows you to do a couple of things that are not normally possible in any other way. You can

- See the mounted VMC and Channel from any remote device
- Force-mount any VMC
- Remotely browse your VMCs and download or upload files
- Change the device settings

The WebUI also allows you to perform a firmware update remotely, by checking for the latest version and informing you of a newer version than the one installed in your MemCard PRO GC.

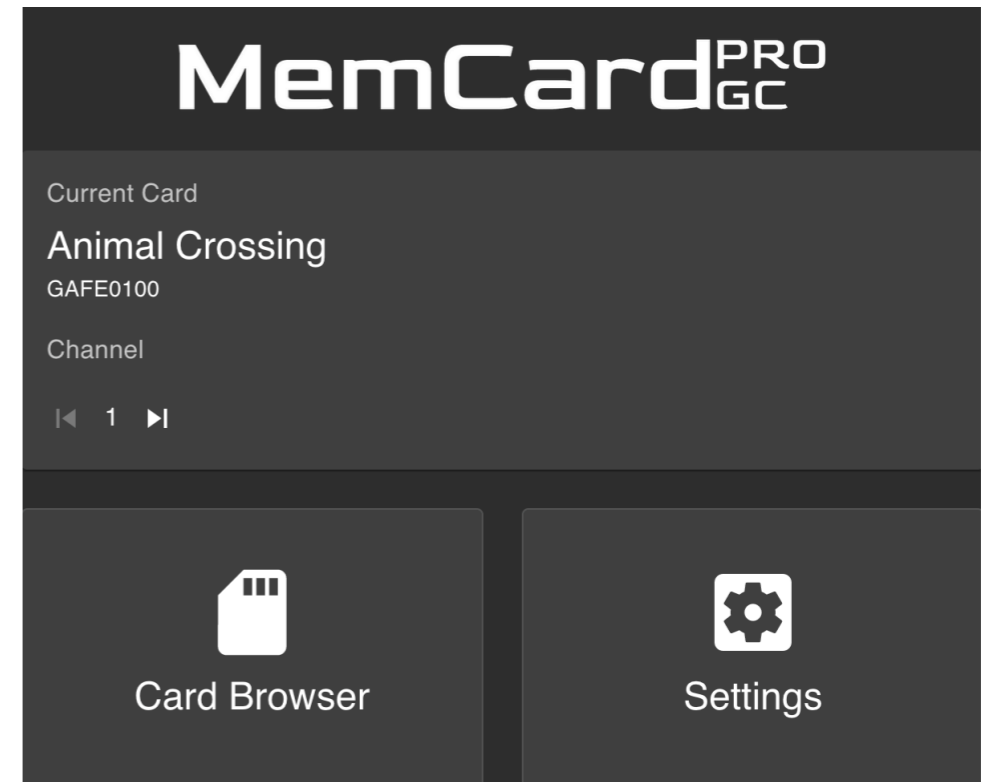
WebUI Home Page

The Home Page of the WebUI shows you information on the current VMC, and info detected from the ODE if you are using one. It also allows you to change the current VMC channel with the click of a button.

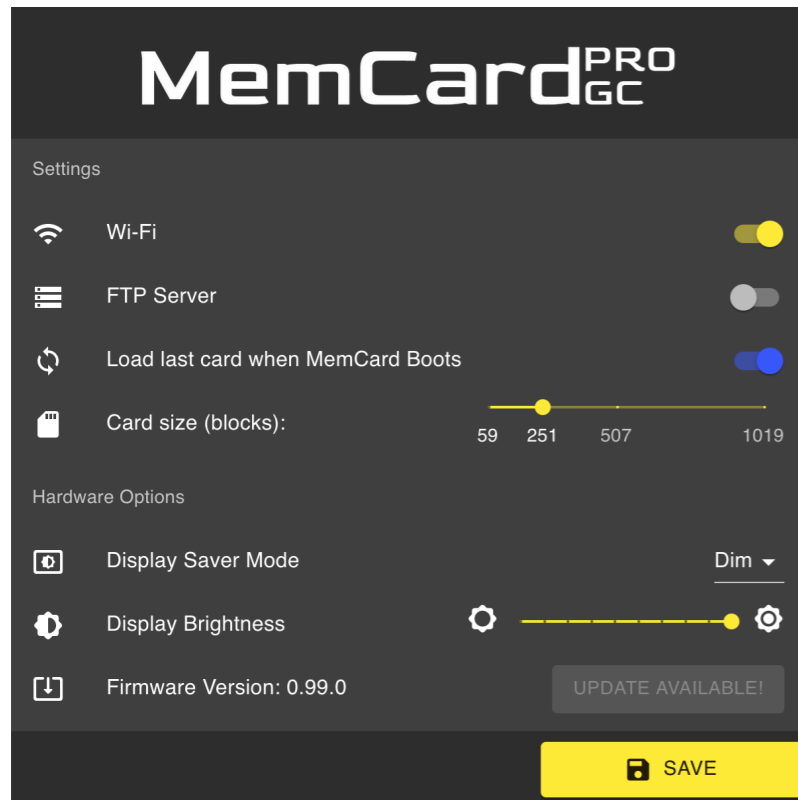
On the top side, the card name or game name is displayed. In ODE mode, the unique GameID is also displayed below the card name.

The current channel is also displayed, and two arrow buttons next to it. Clicking the left or right buttons will switch to the previous / next channel accordingly.

There are also two buttons that allow you to navigate to the Card Browser and the Settings.



WebUI Settings Page



The **Settings** page allows you to configure your MemCard PRO GC. The available options are:

- **Wi-Fi Switch:** Allows you to turn off the WiFi receiver / transmitter on MemCard PRO. **Please note** that doing so will completely turn off the WiFi radio. You can only re-enable the WiFi radio by resetting the MemCard PRO settings back to factory defaults.
- **FTP Server:** This feature enables a lightweight FTP server on your MemCard PRO GC which lets you remotely browse and manage the files on the connected storage device.
- **Load last card when MemCard Boots:** This feature allows you to enable / disable loading the last used VMC automatically on power up. This option is enabled by default.
- **Card Size (Blocks):** This setting allows you to choose what the default block size will be for each VMC that is created on your MemCard PRO GC. Values are displayed in block capacity.

- **Display Saver Mode:** This option allows you to select what MemCard PRO GC does when triggering the display saver mode. The available options are "Dim" and "Turn Off". OLED displays are naturally bright, but can suffer from burn-in when showing static text for long period of times. In order to reduce the effect of this, MemCard PRO GC will automatically dim or turn off the display after 30 seconds of inactivity. When there is activity it will automatically brighten or turn on the display, until the next period of inactivity.
- **Display Brightness:** You can select the display brightness by moving the slider. MemCard PRO offers 10 steps of brightness. This is the "bright" mode, and doesn't affect the brightness of the dimmed mode - which is always at the lowest scale.
- **Firmware Version & Update:** The currently installed firmware version is displayed here. Upon loading this page, MemCard PRO GC will check the latest available version on the remote server and enable the button if a newer version is available.

Card Browser

The Card browser is a utility in the WebUI that allows you to view, manage and load your VMCs remotely.

If the default database template is missing from your storage device, a prompt will appear that will allow you to download and manually add to to your microSD card. Once you download the file, simply copy the "scancache.db" file to your microSD card root. Connect the storage device back to the MemCard PRO GC and power it up. When you visit the Card Browser again, you will now be greeted with an empty list, and a message prompting you to refresh your contents.

To refresh the card contents, press the blue "Scan" button. The MemCard PRO GC will start scanning your storage device for VMCs and it will add them to the Card Browser. This only needs to be done once.

Once scanning is complete, the table will show the available VMCs on your microSD card.

You can now create a new VMC, rename your VMCs, mount them remotely or delete them. If you use an ODE, the VMC will be added to this list automatically.

If you have VMCs created via Swiss, you will notice that the name may be showing as "Not Set". To populate the name automatically, click the "Fetch Name from DB" option next to it, and the name will be populated from the gameId database if it exists there.

MemCard^{PRO}_{GC}

Current Card
Animal Crossing
GAFE0100

Channel
◀ 1 ▶

🔄 +

Card Name	GameID	Actions
Animal Crossing	GAFE0100	⋮
Luigis Mansion	GLME0100	⋮
MemoryCard1	MemoryCard1	⋮
Need for Speed: Underground 2	GUGE6900	⋮
Star Wars Rogue Squadron II: Rogue Leader	GSWPGL00	⋮
The Sims 2	G4ZE6900	⋮

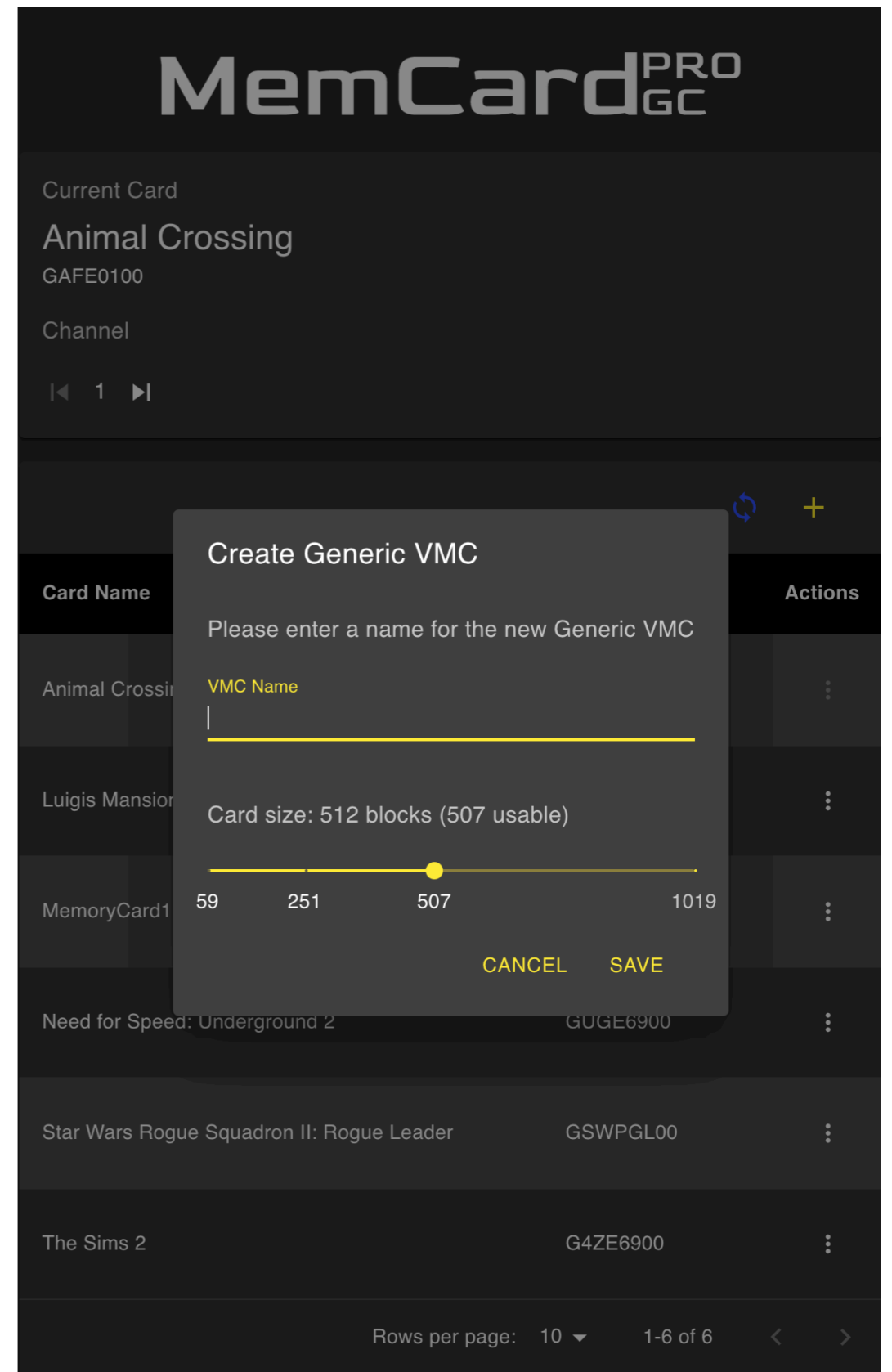
Rows per page: 10 ▼ 1-6 of 6 < >

Card Browser

When you create a new VMC you are prompted to enter a name for it and select its block count. You can use any name you like for it. This name you choose will be displayed on the OLED display when you mount it.

You can also rename any VMC that you've created before, or VMCs that were generated through the GamelD mechanism. Renaming them will override their default name, but their GamelD will still be associated with the game and will be displayed when a GamelD is received.

To rename your card, simply press the white "edit" button. A pop up will appear with a prompt to enter the new name. Once you are happy with the name, click on the "Save" button and the name will be saved to the MemCard PRO GC database.



FTP Server

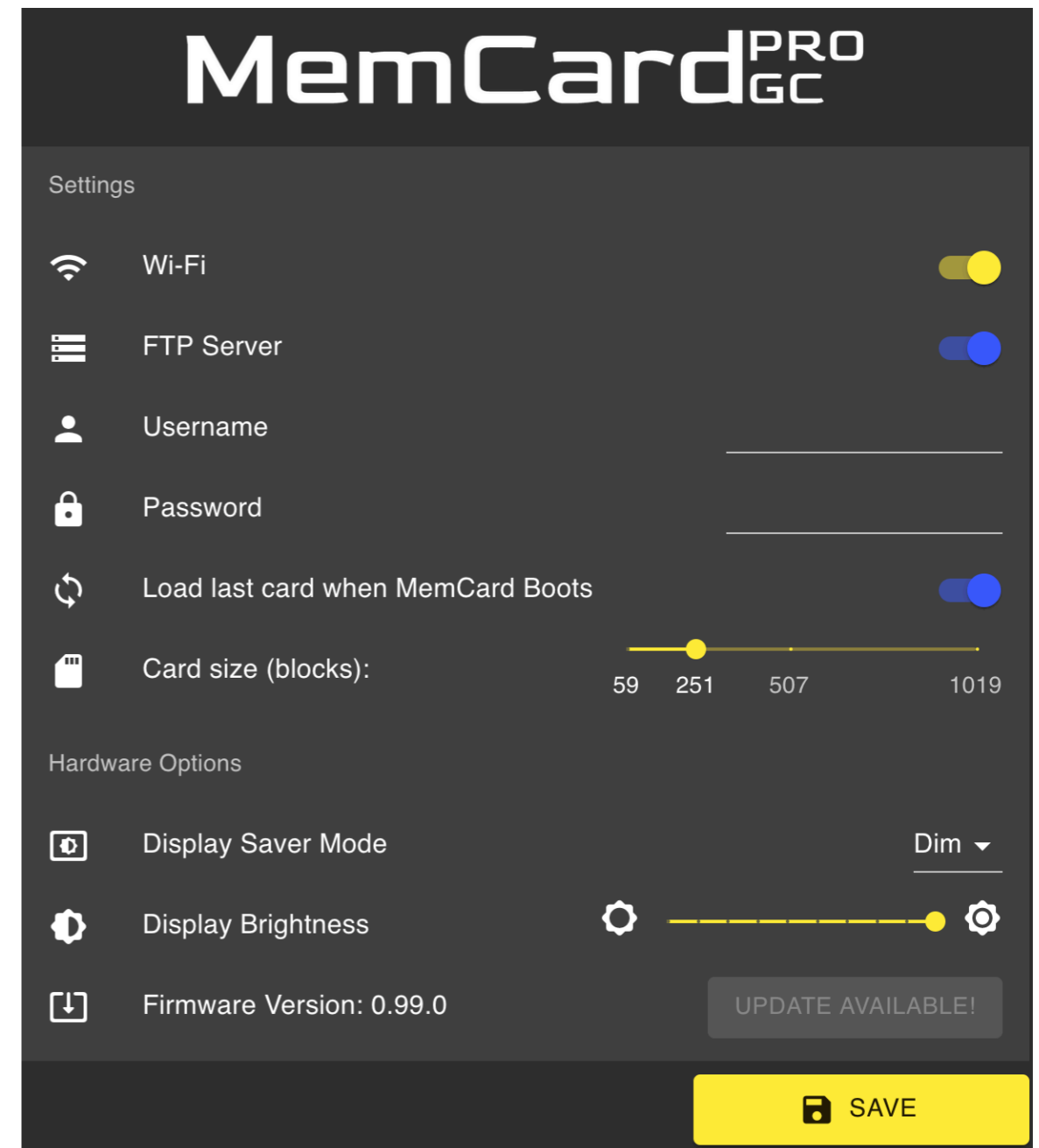
The MemCard PRO GC can host a simple lightweight FTP server (when connected to your home WiFi) which allows you to wirelessly browse and manage your connected storage device's contents, as well as download and upload files directly to it, through an FTP client application on your computer.

The FTP Server is disabled by default and can only be enabled when the WiFi is on and connected to your home wireless network.

To enable the FTP Server, navigate to the WebUI and switch the toggle of the "FTP Server" option in the Settings page.

Once enabled, the "Username" and "Password" fields will show up. You can enter a username and password of your choice to secure the FTP server. This is mandatory, anonymous FTP access is not supported on the MemCard PRO GC.

Once you've entered a username and password, click the "Save" button. You will need to manually power-cycle your GameCube / Wii console / MemCard PRO GC for the changes to take effect.



FTP Server (Cont.)

In order to access the FTP Server, you will need an FTP Client on your computer. We strongly recommend using "FileZilla", an open source, free FTP client that has been tested with MemCard PRO GC.

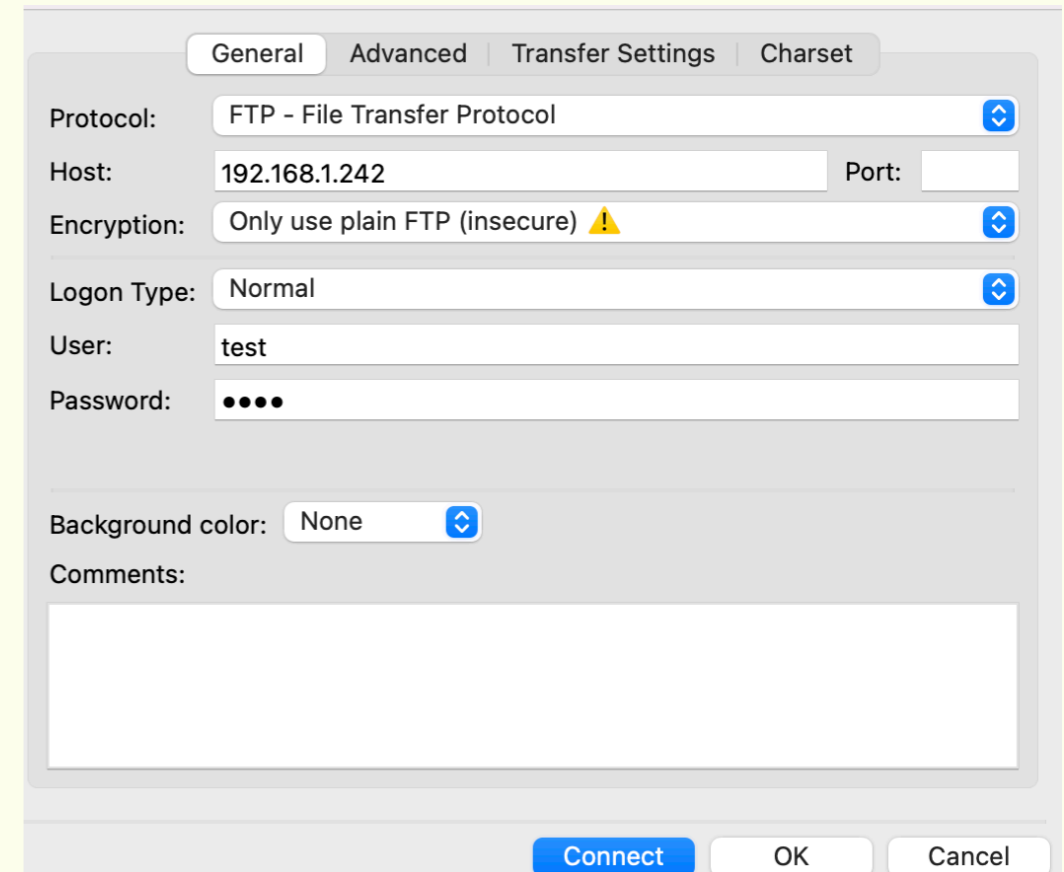
Create a new FTP Connection, and make sure you match the settings on the screenshots on this page for the MemCard PRO GC FTP Server to work correctly.

Multiple connections and Active mode are not supported on the MemCard PRO GC FTP Server, and the settings will need to match that.

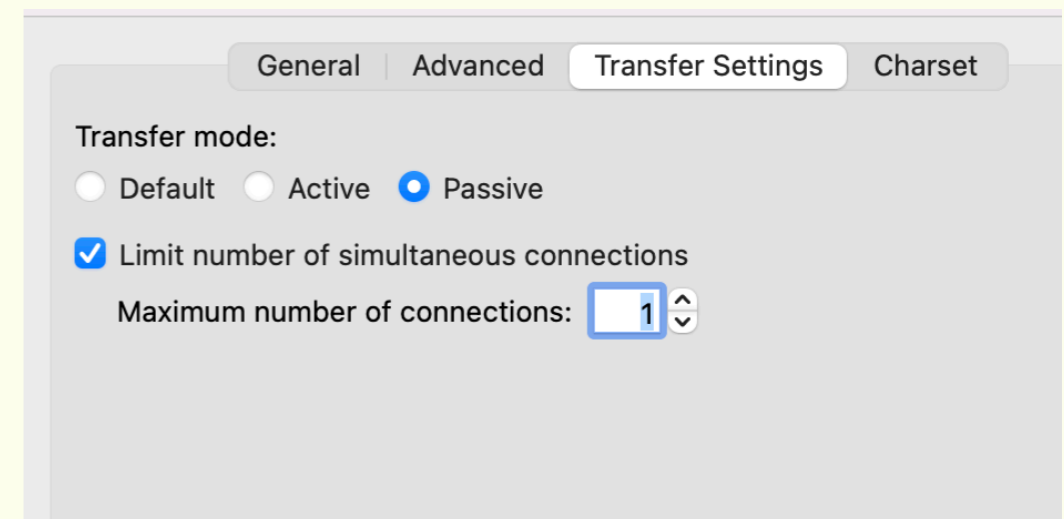
In the "Host" field, enter your MemCard PRO GC's IP address, and choose the "Only use plain FTP" option in the encryption field. Make sure that the username and password you enter here matches the one you entered in the Settings page.

Next, click on the "Transfer Settings" tab. Choose the "Passive" transfer mode, and check the box next to "Limit number of simultaneous connections". Set a value of "1" for the "Maximum number of connections".

If you've done everything correctly, clicking "Connect" will connect you to the MemCard PRO GC FTP Server and list the contents of your SD card!



A screenshot of the FileZilla 'General' tab settings. The 'Protocol' is set to 'FTP - File Transfer Protocol'. The 'Host' is '192.168.1.242' and the 'Port' is empty. The 'Encryption' is set to 'Only use plain FTP (insecure)' with a warning icon. The 'Logon Type' is 'Normal'. The 'User' is 'test' and the 'Password' is masked with four dots. The 'Background color' is 'None'. There is a 'Comments' text area. At the bottom are 'Connect', 'OK', and 'Cancel' buttons.



A screenshot of the FileZilla 'Transfer Settings' tab. The 'Transfer mode' has three radio buttons: 'Default', 'Active', and 'Passive', with 'Passive' selected. There is a checked checkbox for 'Limit number of simultaneous connections'. Below it, the 'Maximum number of connections' is set to '1' in a spinner box.

FAQs & Troubleshooting

1. What file system formats does the MemCard PRO GC support?

The MemCard PRO GC only supports a simple MBR partition scheme with a FAT32 or exFat volume. Please use the official SD Card Formatter software for maximum compatibility.

2. Can the MemCard PRO GC work without an SD card or USB Flash Disk?

The MemCard PRO GC requires either a microSD card or USB flash disk to be connected in order to function correctly.

3. What consoles does the MemCard PRO GC support?

The MemCard PRO GC has only been tested with the original GameCube and Wii Consoles.

4. What VMC card formats does the MemCard PRO GC generate / support?

The MemCard PRO GC can only create and use raw Memory Card images. The file extension used is ".raw" and the files have no extra headers. Any header-less memory card image can be used with the MemCard PRO GC, as long as it is properly named and has the .raw extension.

5. Can I use my MemCard PRO GC saves with an emulator / Can I use my emulator saves with MemCard PRO GC?

Yes! Both use cases are possible as long as the files used have no extra headers.

6. I have connected my MemCard PRO GC to my local wireless network, but I can't open the WebUI page!

A few different causes can lead to this, with the most common being that the remote device is not on the same subnet as MemCard PRO GC. You should be connected to the same network as the MemCard PRO GC in order to access its WebUI. Another reason is that the MemCard PRO GC was unsuccessful connecting to your wireless network. You can try moving the console and MemCard PRO GC closer to your router if that's the case, or changing the WiFi channel of your router to one that's not used by other routers around your building. If you don't see an IP address on the MemCard PRO GC, and the WiFi icon shows an "x", this means that the connection was unsuccessful.

FAQs & Troubleshooting

8. Can I disconnect from my router and “forget” the associated WiFi SSID?

Yes, you can do that by pressing and holding both physical buttons on the MemCard PRO GC while it's on. A message will appear, and once you release the buttons, the MemCard PRO GC will reset to Access Point mode. You should be able to scan for the access point and start the WiFi Setup Wizard again.

9. I disabled the WiFi from the settings page, but now I want to enable it again. How can I do that?

The only way to re-enabled the WiFi, is to perform a factory reset. You can do this by holding down the left physical button on the MemCard PRO GC card while powering up the console. This will not erase your saves, but it will reset all settings back to factory defaults, including the WiFi option.

Declaration of Conformity

Manufacturer:

Profile West Suite 2,
Floor 1,
950 Great West Road,
Brentford,
TW8 9ES
UK

AppCake LTD declares under our sole responsibility that:

Product Name: MemCard PRO GC

Product Model(s): MCPGC01

Complies with the following European Directives:

2014/30/EU Electromagnetic Compatibility (EMC)

2014/45/EU Low Voltage (LVD)

2015/863/EU on the Restriction of Hazardous Substance (RoHS3)

Conforms to the Following Standards:

EN 301489-1 V2.2.3 (2019-11) (EMC emissions and interference)

EN 301489-17 V3.2.4 (2020-09) (EMC emissions and interference)

EN 62368-1:2014+A11:2017 (LVD)

EN 63000:2018 (RoHS)

The technical documentation required to demonstrate that the products meet the requirements of the aforementioned directives has been compiled and is available for inspection by the relevant enforcement authorities.

Signed:

Title: Director

Date: 15/02/2023

