

# SUPER·HD SYSTEM3 »»PRO





# ATTENTION!

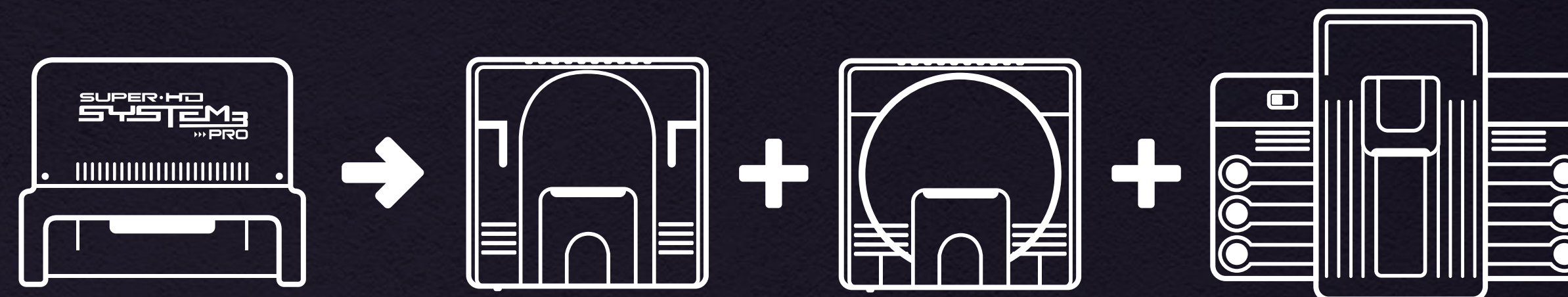


*This manual **is a work in progress,**  
an advanced revision is forthcoming.*

*Please **visit our Discord channel** for further assistance:  
<https://discord.gg/JexuJWV> if you have any questions or concerns.*



# SUPER·HD SYSTEM3 »»PRO



## Contents

- 4 - Key Features
- 5 - Getting Started
- 6 - Setting Up the MicroSD Card
- 6 - Adding Bios Images
- 7 - Adding HuCard Games
- 7 - Adding CD-ROM Games
- 8 - Using Original HuCards
- 9 - AV Output Options
- 9 - Game reset and return to game selection

- 10 - Navigating The Menu / Game List
- 11 - Options
- 14 - Video Options
- 17 - Cover View Menu
- 18 - Firmware Updating
- 18 - Miscellaneous
- 19 - Add-on FPGA Cores
- 19 - Limitations and Caveats



# Key Features

Super HD System 3 Pro is an all-in-one add-on for your PCEngine, CoreGrafx or SuperGrafx console that allows you to play the entire family of PCEngine games in brilliant HDMI or RGB video.



480P/720P HDMI output created from digital video



Play ALL HuCard, CD / Super CD / Arcade Card and SuperGrafx games on ALL consoles



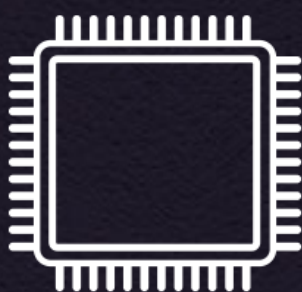
Built in Arcade Card



RGB Video / Stereo Audio output via MegaDrive 2 / Genesis 2 9 pin Mini-DIN port



MicroUSB port for game developers



3rd Party FPGA Cores loaded from the MicroSD card



Jailbar free, balanced video and MDfourier balanced audio



In Game Trigger to return to the game menu (both from controller and rear of unit)



MicroSD slot compatible with large SD Card support ( >400GB).



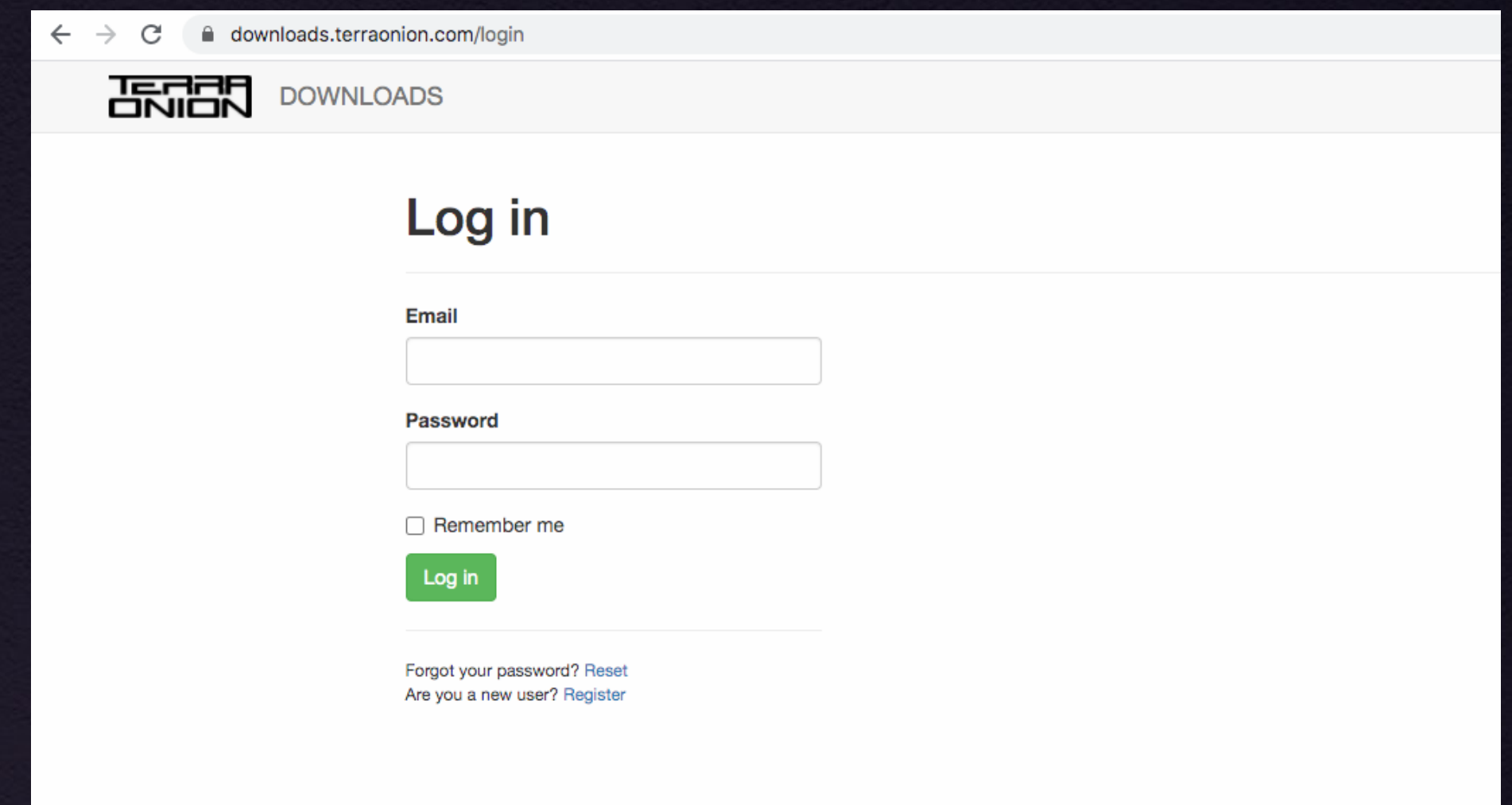
## Getting Started

After receiving your Super HD System 3 Pro, the first thing you should do is register the device at <https://downloads.terraonion.com/>

Here you will find updated firmwares, manuals and any additional software we have for it. **Firmware updates are serial number specific,** so if you have multiple devices make sure to have all of them registered. See the section “Firmware Updating” later in the manual about performing the update.

Tip: Need assistance or just want to chat?

Join our Discord: <https://discord.gg/JexuJWV>

A screenshot of a web browser showing the login page for downloads.terraonion.com. The page has a header with the Terraonion logo and the word "DOWNLOADS". The main heading is "Log in". Below it are input fields for "Email" and "Password". There is a checkbox for "Remember me" and a green "Log in" button. At the bottom, there are links for "Forgot your password? Reset" and "Are you a new user? Register".

← → ↻ 🔒 downloads.terraonion.com/login

**TERRA ONION** DOWNLOADS

### Log in

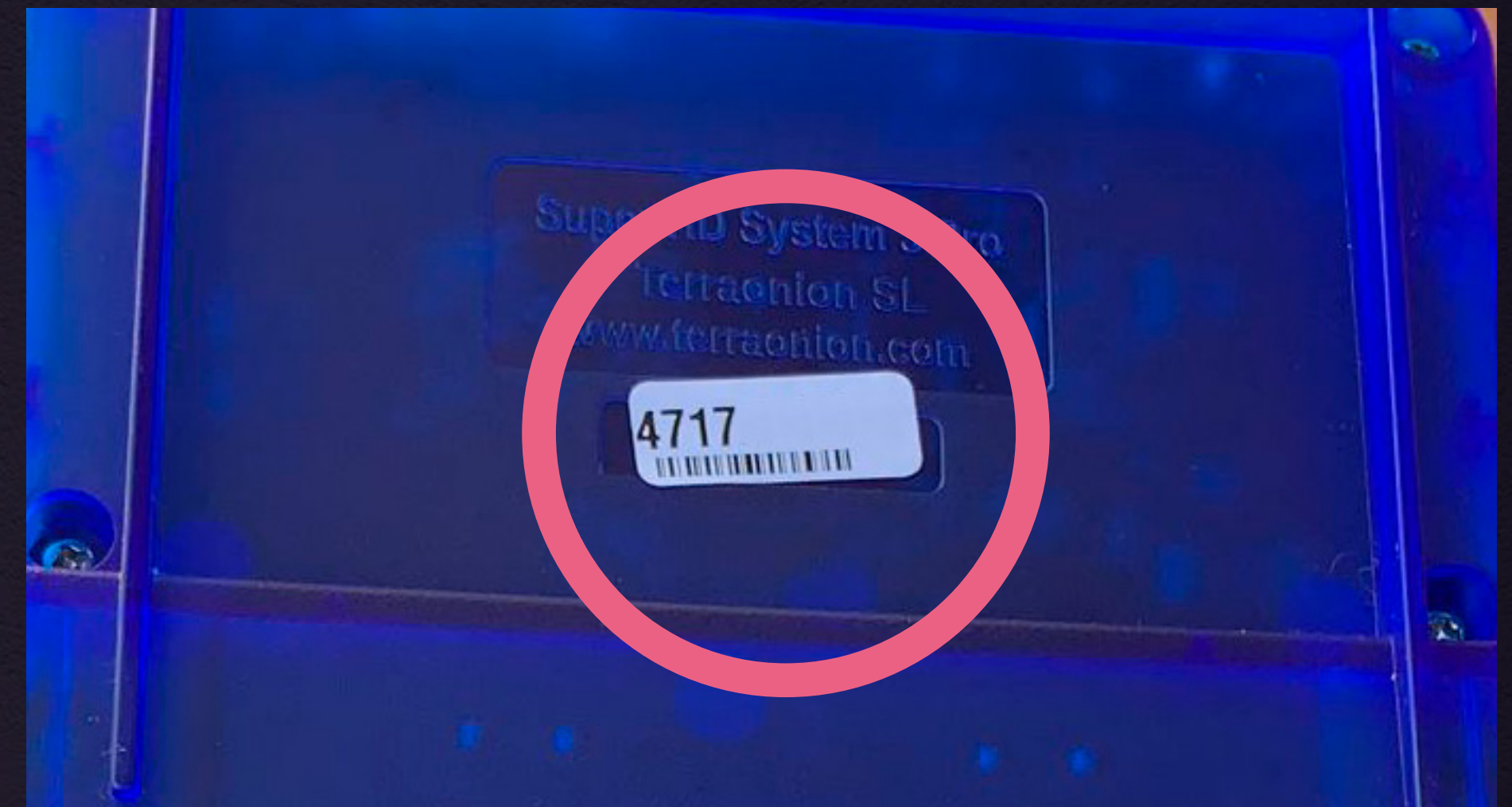
Email

Password

☐ Remember me

**Log in**

[Forgot your password? Reset](#)  
[Are you a new user? Register](#)





## Setting Up The MicroSD Card

The SHDS3 Pro supports both **FAT32 and exFAT formatted MicroSD cards up to 400GB+.** It also supports folders/directories, so you can use them to group and organize your games.

The maximum number of games that can be displayed in a folder is 1000. More than this and they will need to be split up into several folders.

## Adding BIOS Images

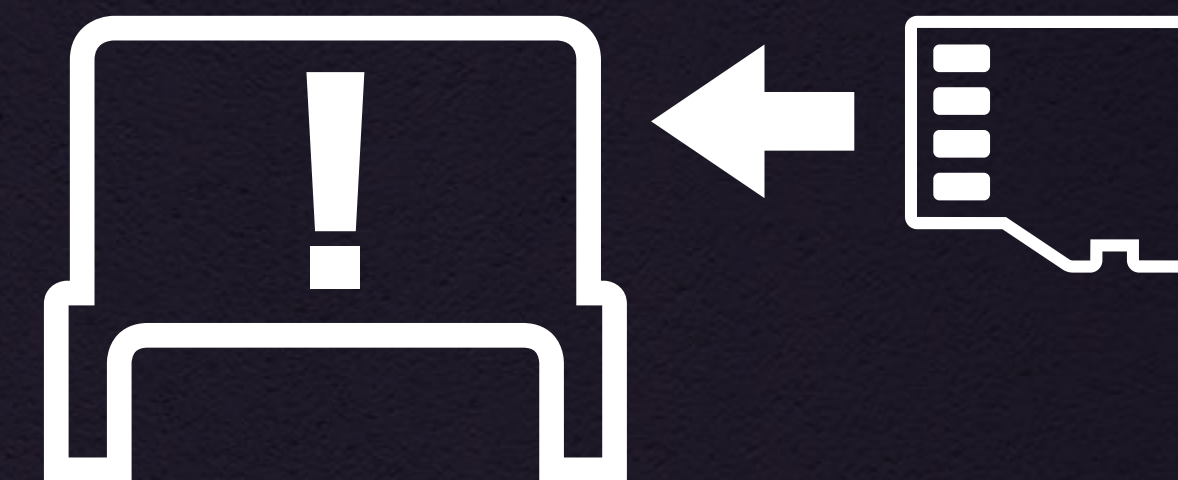
After formatting the MicroSD card, create a folder called "BIOS" in the root of your MicroSD card. **Place the BIOS images ending in .pce in the BIOS folder.**

The SHDS3 Pro can display up to 10 different BIOS files to choose from.

**Do not exceed this as more than 10 will not display.** Additionally you can place a BIOS file into individual CD-ROM game folders to specifically use a certain BIOS and override the defaults in the options screen.



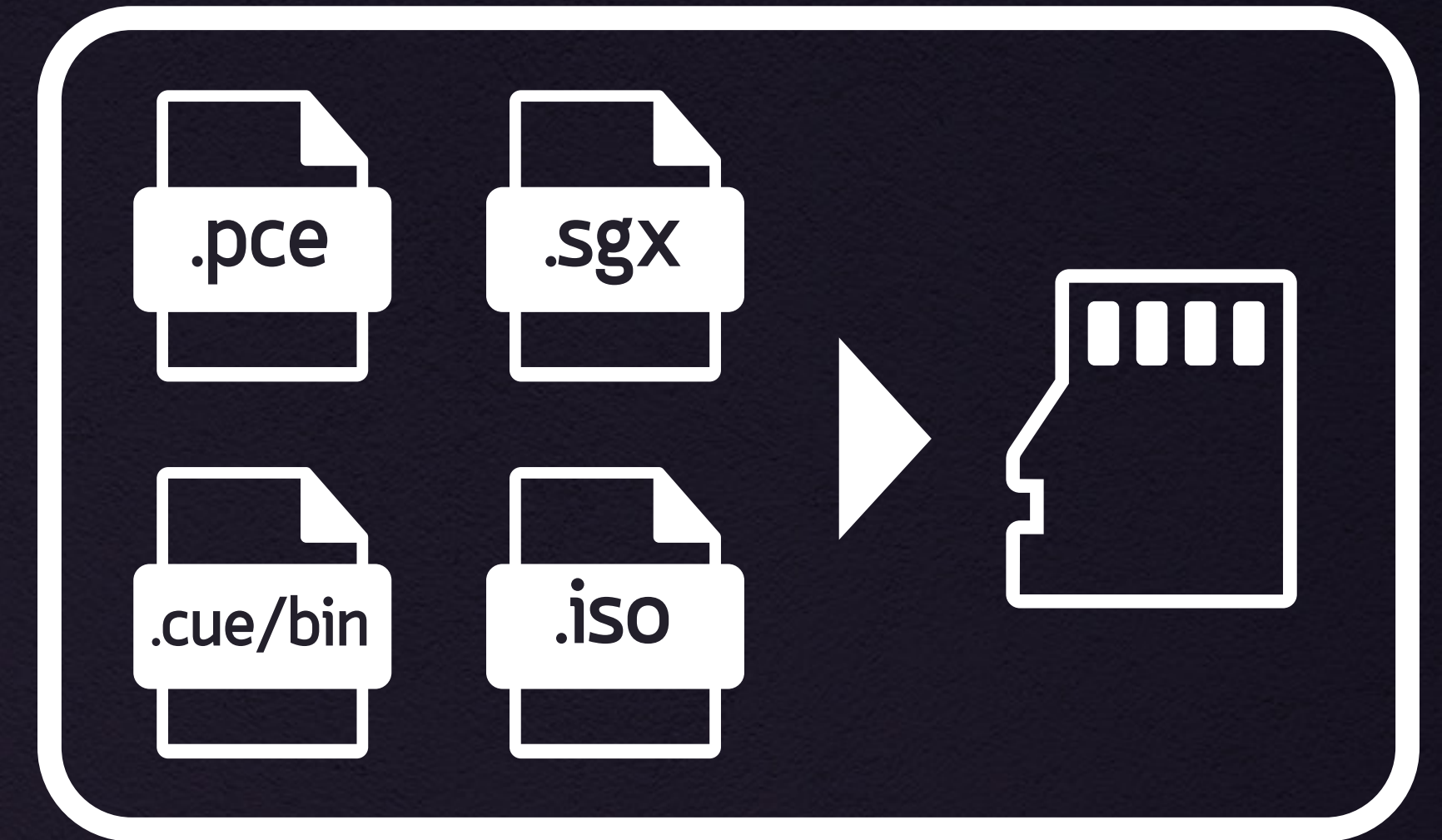
**Power Off your PC Engine to insert or remove your MicroSD card from your Super HD System 3 PRO**





## Adding HuCard Games

Copy the **ROM files ending in .pce ( .sgx for SuperGrafx is also supported)** to the MicroSD card. You can organize them however you like by placing them either into the root of the MicroSD card or into sub folders.



## Adding CD-ROM Games

**Copy the folder containing the .cue and .bin/.iso/.wav file for each game as-is to the MicroSD card.**

The SHDS3 Pro menu will identify the game folder as a CD and will display it as a game to launch instead of a folder to navigate into. CD-ROM games require a BIOS image to work (see earlier section regarding copying over BIOS images).

*Tip: For maximum compatibility, we recommend the CD images checked against redump.org preservation initiative datafiles. CD images with .mp3 audio (or other compressed audio formats) are NOT compatible.*



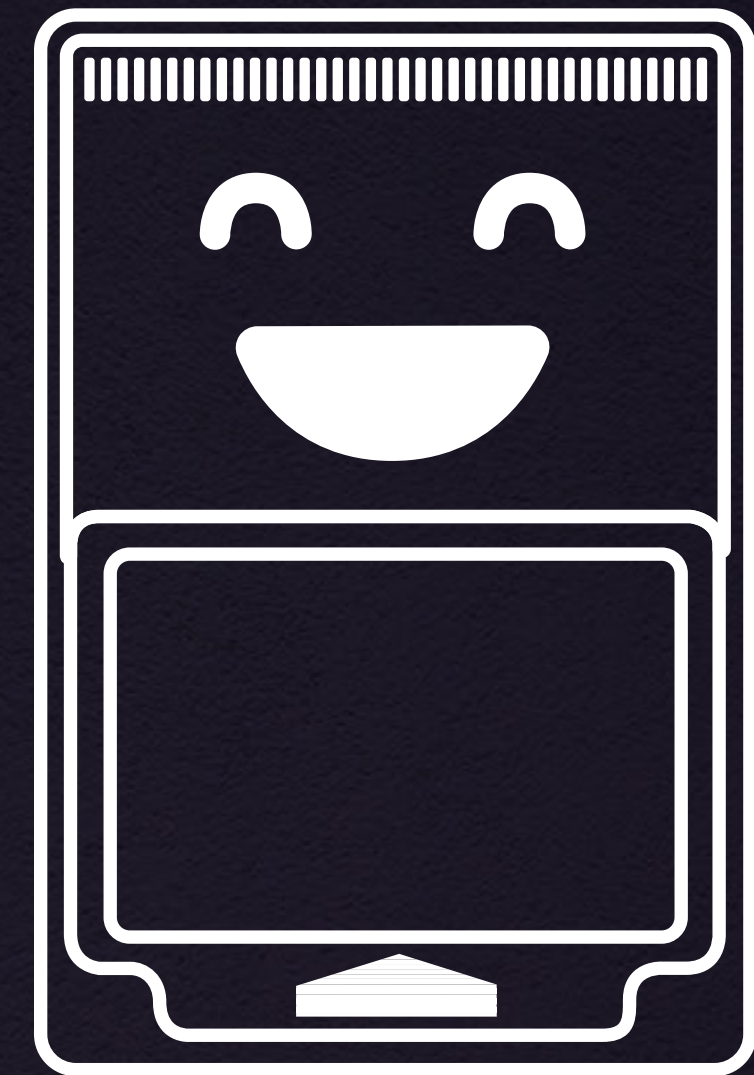
## Using Original HuCards

**You can use original HuCards while the SHDS3 Pro is connected.** When it detects an original system card, it will disable all HuCard emulation, but will keep the CD-ROM block enabled as if an IFU unit was present so games can use the backup RAM. Because the SHDS3 Pro can't detect which kind of HuCard you are using in this way, the extra Super CD-ROM RAM and the Arcade Card emulation will be disabled.

**You can also use your own Super CD-ROM system cards to boot the CD games.**

When using original HuCards, the per-game backup RAM mode will be disabled because the SHDS3 Pro doesn't know which game name to use and will use the BACKUP.BUP file for all.

SHDS3 Pro does not support SuperGrafx simulation when using original SuperGrafx HuCards, even on original SuperGrafx hardware, and thus these games are only supported via the SHSD3 Pro via MicroSD card.



***Enjoy your original  
HuCard and CD-ROM  
Games!***



## AV Output Options


SHDS3 Pro allows you to either use an analog RGB output via a compatible Mini-DIN video cable or use a digital output using an HDMI cable.

**You can't use both outputs at the same time** as the HDMI cable has priority over the analog cable. So when an HDMI cable is plugged in, analog output will be blank although audio will still be output from the analog audio pins in the cable.

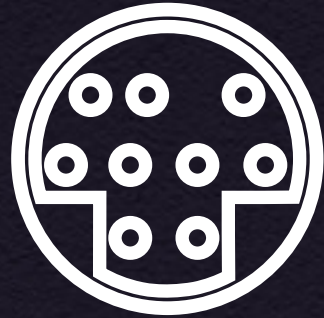
## Game reset and return to game selection

Using the push button at the back of the SHDS3 Pro you can reset the current game, and also return to the SHDS3 Pro game selection menu.

- A short press will just reset the current game.
- A long press (over 3 seconds) will reset SHDS3 Pro to the game selection menu.



480P/720P HDMI output  
created from digital video



RGB Video / Stereo Audio  
output via MegaDrive 2 /  
Genesis 2 Mini-DIN port









**Short Press**  
**Reset Game**



**Long Press**  
**Back to menu**



## Navigating The Menu/Game List

-  Use **Up and Down** to move the highlighted field up and down the game list.
-  Use **Left and Right** to advance the game list one page at a time.
-  Press **Button II** to enter folders and launch selected games.
-  Press **Button I** to go back a folder if you are in a sub folder and to exit the options menu.
-  Press **Select button** to open the options menu
-  **Run button** is reserved for future menu features





## Options

**Press the Select button to launch the options menu.** Use **Up and Down** to navigate the menu, **Button II** to make selections and **Button I** to exit options. Some fields use Left and right to scroll through multiple options.

**Game List Type – List and Cover:** List view is a simple list of game titles whereas Cover view displays high resolution artwork. More details in the Cover View Menu section.

**Boot To Last Game:** With this enabled, the next time you power on your console, it will boot directly to the last game that was loaded rather than booting to the SHDS3 Pro menu. Hold down the **RUN button** at power on to bypass this option.

**Reverse Menu I & II:** When enabled it swaps the functions that buttons I and II perform.

**Enable in-game trigger:** This option enables the ability to exit from a game and go directly back to the SHDS3 Pro game menu from the gamepad. Press and hold **SELECT + RUN** for several seconds to exit the game and go back to the menu.

**Skip CDRom ‘Press Run’:** With this option enabled, you don’t need to press RUN on the Super CD-ROM bios screen to boot a CD game. Disable this option to enter into the CD-ROM save management screen (press SELECT when you see “Press RUN Button”).



## Options

**Seek time emulation:** (default off) Enabling this option makes SSDS3 PRO simulate the time the CD read header takes to move from a part of the disc to another. Loading data will take a bit longer, but will fix some CD audio desyncs in some games. Regardless of this option, the CD read speed will be the same as the original hardware as it only affects the seek time.

**Per-Game Backup Ram:** Enabling this option causes each game to save its own backup RAM onto the microSD card avoiding the backup RAM limitation that CD-ROM systems have. Backup RAM is stored in the BUP folder on the root of the microSD card. When not using the per game backup RAM mode, a single file named BACKUP.BUP will be used for all games.

**Enable Arcade Card:** Disabling this option disables the extra RAM arcade card emulation. This is intended for games that behave differently when playing with an Arcade Card and without it.

**Enable HuCard Dumper:** This setting allows dumping your own HuCards. In order to dump your card, set this option to On, turn the console off, insert your HuCard and turn it on. A dumper screen will appear to read the hucard data to the SD card.

**CD block volume:** Raises and lower the CD and ADPCM audio volume. Default is 50.



## Options

**PCE sound volume:** Raises and lowers the PCE generated audio volume. Default is 50.

**Select CD-ROM System card:** Allows you to choose the desired system card to use with CD-ROM games.

*Tip: Some CD games require a different bios version than you may have selected in here. You can copy the bios required for the game to its folder and it will use that instead of the system bios.*

*This is a per game bios feature.*

**Video Options:** See next section titled “Video Options” for more information.

**UI Theme:** Scroll through this list using left and right on the D-PAD to select from 4 different UI color themes.

**Scan Folder:** Use this when adding the Cover View artwork database to scan the folders for games to associate the artwork with.

Cover artwork database file can be downloaded from <https://gamedb.terraonion.com> and needs to be placed at the root of the MicroSD.

**Version:** Displays the serial number and software versions of the SHDS3 Pro.





## Video Options

Go into the options menu and select Video Options. Use the dpad **Up and Down** to navigate the options and **Left and Right** to scroll through the different selections.

**Digital Video Mode:** Multiple buffered and unbuffered options to choose from. 720x480, 640x480 and 1280x720 are all buffered video modes that have 1 frame of latency. 720x480 Unbuf is an unbuffered virtually zero latency video mode. However not all displays will support it.

*Tip: If you select a video mode that is incompatible with your display (typically resulting in a black screen or a “incompatible video resolution” type message), press the Select button and it will default back to a safe and compatible resolution of 720x480. Don’t press the Back button or it will be saved. If this happens, you can either use the analog output to change the values back, or create a blank reset.cfg text file in the root of the sd card. When SHDS3 boots and a reset.cfg file exists, it will reset all options to defaults, including the video options. This blank file can also be downloaded from <http://downloads.terraonion.com/public/reset.cfg>*

**Scanlines Mode - Off, Fixed and Adaptive:** Off will just replicate the lines at the same brightness when upscaling, Fixed will apply a fixed factor for the intermediate lines. Adaptive will apply a factor proportional to the brightness of the pixel, thus making the scanlines less visible when the pixel brightness is higher.

**Scanlines Brightness:** Only available when using Fixed Scanlines mode. Increases or decreases the brightness of the scanlines allowing you to tailor the look of the scanlines. Lower number means more pronounced scanlines and higher means less pronounced.



## Video Options

**Scaling Mode – Smooth or Sharp:** Smooth applies a filter to soften the video and prevent an overly pixelated image. Sharp is a more detailed image where the individual pixels are easier to see. This option behaves a bit different in 720p mode: because PCEngine has 3 different possible resolutions, it's not possible to have an integer scaling that works for all three, so sharp mode will always create artifacts when the game uses a non integer multiple resolution (for example a game using 256 pixels wide resolution while SHDS3 Pro is set to 640x480 mode).

To overcome this issue, when using 720p and Sharp mode, the aspect ratio of the image will be slightly altered based on the game resolution in order to have an integer scaling. 256 and 512 wide modes are scaled to 1024 instead of 960 pixels wide, thus being slightly wider, but having integer scaling (x4 and x2). 320 wide mode is scaled to 960 pixels wide (x3).

**Analog Color Table:** When using RGB output from SHDS3 Pro, you can toggle between a traditional RGB color palette or a custom RGB palette. These palettes convert the 3 bit RGB colors that PCE uses into 8 RGB. Palettes are added to the SYS\PALETTES folder in the SD card, and must have a .pal extension. They are text files containing pairs of pce color (in hexadecimal) : output color (in hexadecimal) one each line. You can directly use intel/altera .mif files renamed to .pal .

**Analog Brightness:** In some setups (for example when using HD retrovision cables) you may find the RGB output too bright. In these cases it is recommended that you use the Reduced brightness setting.



## Video Options

**Digital Color Table:** Just like the Analog color table, this allows you to select a direct palette or a custom palette, but when using HDMI output.

**Digital Color Range - Limited or Full:** Limited restricts the color range between 16-235 and Full is 0-255. This setting depends on the display that you are using and if it's capable of Full range RGB.

*Tip: If you select Full range and darks are abnormally dark resulting in a loss of detail in the dark areas of the picture during games, change this back to limited which will match your monitor/tv settings.*





## Cover View Menu

Much like MODE (the Multi Optical Disc Emulator for Saturn, DC and PSX), **SHDS3 Pro offers both a list and a Cover View menu interface** for folks that like a little extra bling in their interface.

This is generated by the FPGA, so navigating the Cover View interface is lightning fast.

**Login and download the database file from <https://gamedb.terraonion.com/>**

and place it on the root of your MicroSD card.



**Go to Options and change Game List Type from List to Cover View.** Go down to the bottom of the Options menu and select Scan Folder.

This will take some time depending on the quantity of games that you have on the MicroSD card.

Please note that we use redump.org as our basis for defining CRC information for matching covers. If a game is not known to redump, it is altered (hacks), or it is homebrew covers may not be present.



## Firmware Updating

From time to time we may release **firmware updates for the SHDS3 Pro to add features,** address issues or perform bug fixes.

Once you have **downloaded the firmware update from <https://downloads.terraonion.com/>**, unzip the firmware update and inside there should be a file named XXXXXXXX\_update.upd. The first 8 characters will be the serial number of your device. The serial number can be found at the options menu.

**Copy this file to the root of your microSD card** and power the console on.

Follow the instructions on screen to perform the firmware update.

```
FIRMWARE UPDATE DETECTED
CURRENT VERSION 01.00 R03
NEW VERSION      01.00 R04
SERIAL           00000000
PRESS II TO UPDATE
OR I TO CANCEL
```

```
UPDATE IN PROGRESS
PLEASE WAIT...
DON'T TURN YOUR CONSOLE OF
```

## Miscellaneous

The Super HD System 3 Pro has a **MicroUSB port on the rear of it reserved for developer and future usage.** We will update this documentation later on once it's usage has been finalized.

**There is also a push button as well.** This acts like a physical In-Game Trigger. Tap once to reset the game (like pressing Select+Run on the gamepad) or hold the button down for a couple seconds to exit the game and go back to the SHDS3 Pro game menu.



## Add-on FPGA Cores

Add-on FPGA cores are stored in the SYS folder at the root of the MicroSD, with a folder for each system. The folder name selects the ROM extensions that are used for that core, for example placing an add-on core files into a NES folder inside SYS will make all games with the .NES extensions to use that FPGA core.

## Limitations And Caveats

Due to design considerations and needing to interface with original hardware, there are a few limitations with SHDS3 Pro that you should be aware of.

- **Composite video output when using FPGA cores is not available** as the composite video pin on the SHDS3 Pro 9 pin Mini-DIN is routed to the composite video pin on the PCE EXT bus and not generated by the FPGA.
- **RGB output when using add-on FPGA cores will require a composite sync (CSYNC) RGB cable** and not one that uses composite video as sync due to the composite video not being generated by the FPGA as mentioned above.



## Limitations And Caveats

- Due to the way the video chips are connected to the expansion port in a SuperGrafx console, Mode I (real SuperGrafx mode) is only partially supported, and Mode II (PC Engine mode) should be used for maximum compatibility. Additionally as the SuperGrafx's video mixer is not passed on the digital lines original SuperGrafx HuCards are not supported.

- **You can't use both HDMI and Analog outputs at the same time** as the HDMI cable has priority over the analog cable when it's plugged in. So when an HDMI cable is plugged in, analog output will be blank although audio will still be output from the analog audio pins in the cable.

- **Sharp scaling will always produce some artifacts when used at 720x480 and 640x480 resolutions** and the pce game resolution is not an integer multiple of the display area (512 and 256 wide games look fine in 720x480 and 320 wide games look fine in 640x480). Using smooth scaling will make them look fine, although it will look a bit blurry. Using sharp on 720p will use integer scaling for all resolutions, although 256 and 512 pixels wide modes will be slightly wider.

- Due to the way SHDS3 Pro interacts with the original SuperGrafx software to use as much original hardware as possible, some game calls may need to be modified on SuperGrafx homebrew in order to obtain full compatibility.

- Since RGB output is generated using the PC Engine's original resolutions, **the cover view is downgraded to fit within those specifications.** For higher resolution covers use HDMI.



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# TERRA ONION

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and optical disc emulators***

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***We love retrogaming!***