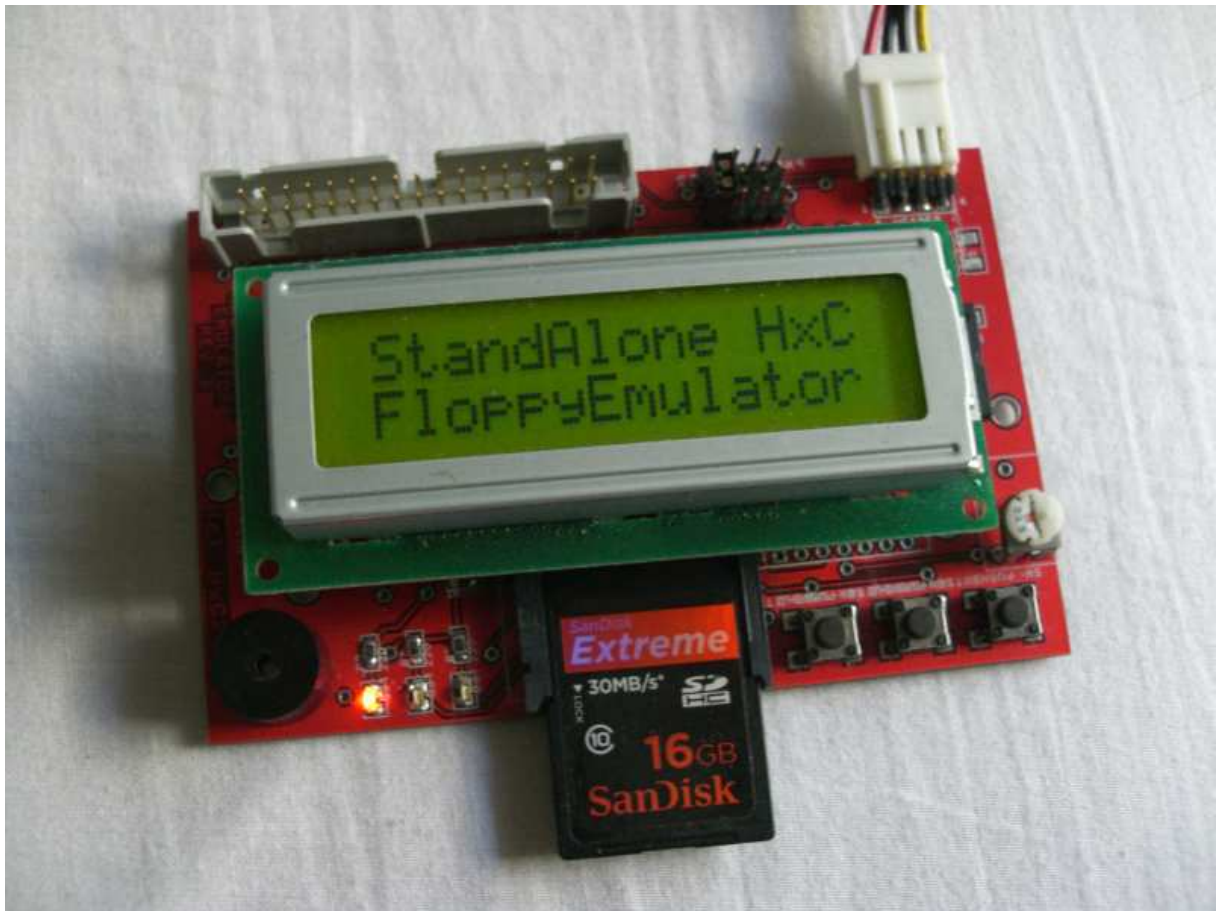


SDCard HxC Floppy Emulator

User Manual



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1) General description / requirement

The SD HxC Floppy Emulator is a floppy emulator based on SD/SDHC memory card.

To use it you need :

- An computer with a Shugart compatible Floppy interface:
 - o Amiga, Atari ST, Amstrad CPC, ZX Spectrum, PC ...
- An SD or SDHC memory card (64MB – 32GB).
- A PC to pre-process/prepare floppy file images and copy them on the SDCard.

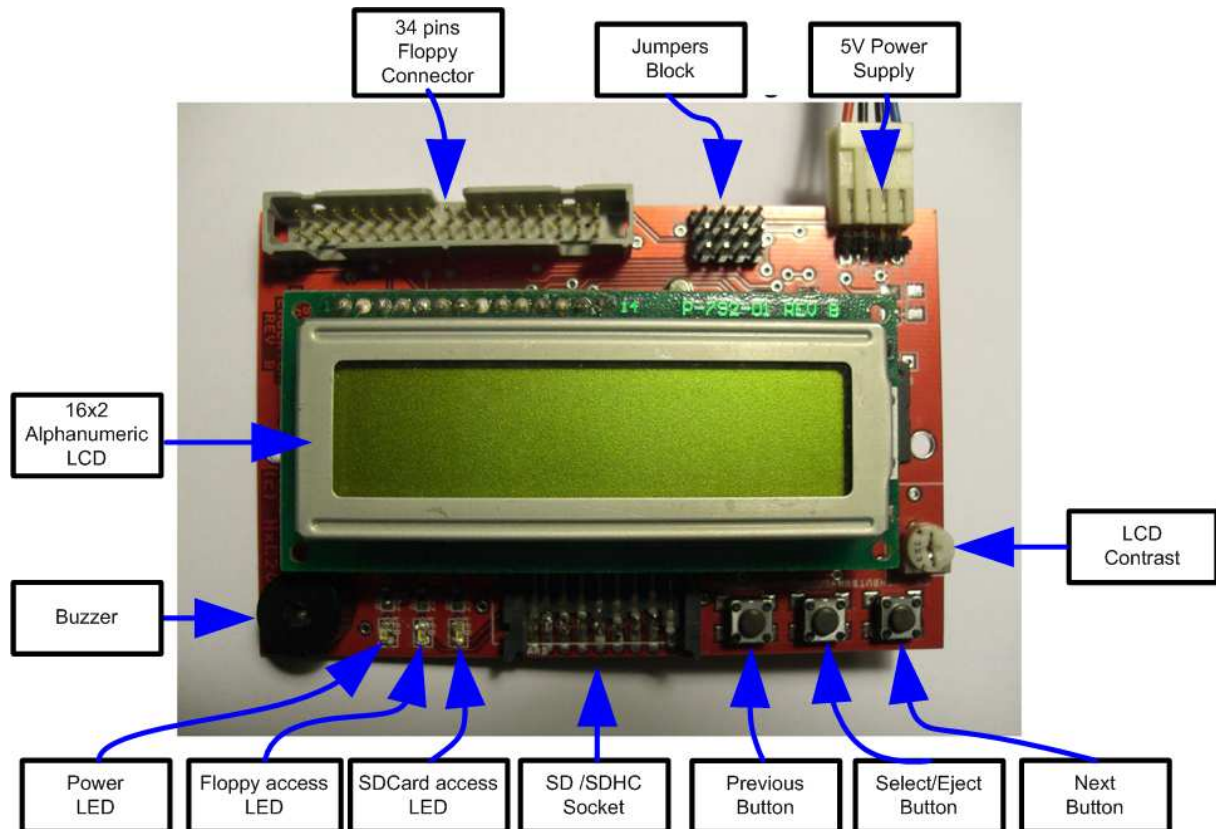


Figure 1 : The SD HxC Floppy Emulator

2) Power supply

The Floppy emulator need a **+5V** power source to work.
The power source must be able to deliver at least 500mA for proper operations (200mA for HxC Floppy Emulator consumption + 200mA for the SD/SDHC Card).
The power supply connector is a standard floppy disk drive power supply connector.
The +12V line is not used by the emulator.

Below the power connector pinout:

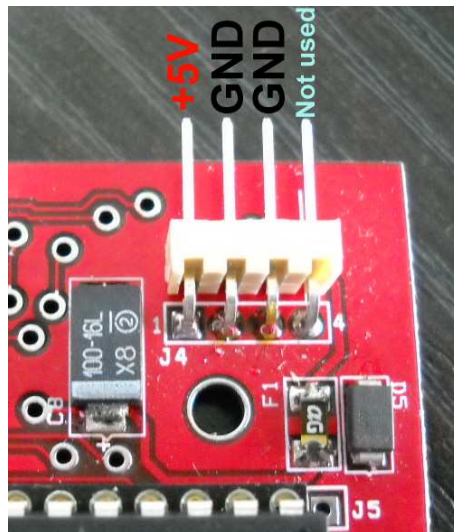


Figure 2 : Power supply connector pinout



A special care should be taken before connecting the power supply. The device and the host computer can be damaged if the device is powered with a bad voltage.



Amstrad CPC6128 users : The CPC6128 floppy connector has an inverted pinout : +5V and +12V are exchanged. Unlike others systems : Orange wire=5V, Red wire=12V, Black wires=GND. Special care must be taken before connecting the power supply connector on the CPC6128.

To test the device securely, disconnect the +12V power source, the CPC6128 doesn't need it.

3) Floppy interface connection

A 34 pin floppy cable should be used to connect the device to the host computer. Twisted and non-twisted cable can be used.

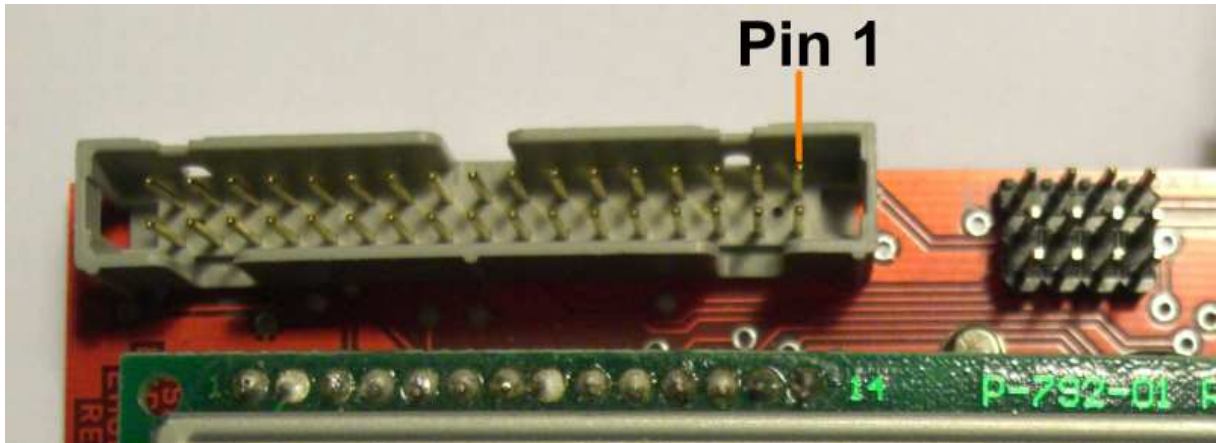


Figure 3 : Floppy connector

Note 1: On most computer, pin 1 are indicated by the red wire on the on place floppy cable. In this case the floppy cable may be connected directly (red wire on the pin 1 side – to the right).

Note 2: On some **Amiga** computers, the original floppy cable is inverted : So pin 1 is in the opposite side of the red wire. In this case connect the floppy cable on the opposite side to the emulator (red wire to the left), or reconnect the floppy cable in the right side on the Amiga motherboard.

Note 3: If you are using the external floppy port of an **Amstrad CPC6128** computer, you must connect the floppy cable on the opposite side to the emulator (red wire to the left). To switch the emulator as the first disk drive and disable the internal disk drive, wire 23 must be connected to the ground (with wire 24 for example).

Note 4: If after connecting and setting the jumpers the Floppy access LED still always on, this probably means that the floppy cable is inverted.

4) Jumper settings

Here is the jumper configuration settings:



Figure 4 : Jumpers settings

To use the device you must assign at least one ID drive for the emulator. Since the emulator is able to emulate 2 disk drives, there are 2 ID inputs : "Drive A" and "Drive B".

Unlike real floppy disk drive the HxC Floppy Emulator doesn't use the motor control line. So there are only one jumper to set per virtual disk drive.

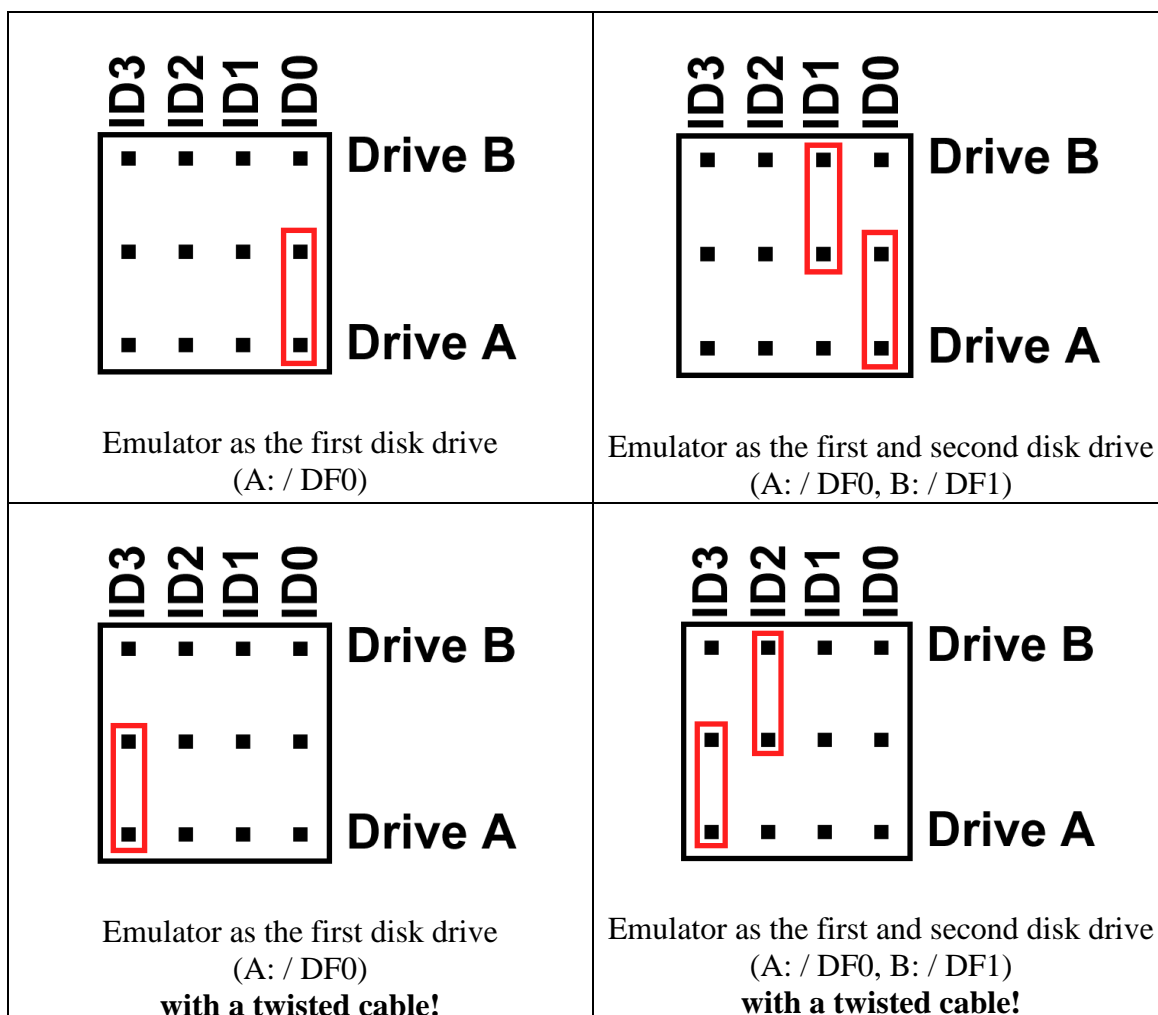
Depending of the host computer type and of the floppy cable used (twisted or not), the meaning of IDx/jumper lines can change. Above you can see some examples of jumper settings.

a. Atari ST / Amiga / Shugart jumper settings

ID line	ID3	ID2	ID1	ID0
Host Line	MTRON	DS2	DS1	DS0
Function	Motor On	DF2	B: / DF1	A: / DF0

Note : If your are using a twisted floppy cable, the ID lines are inverted. In this case IDs lines meaning are changed:

ID line	ID3	ID2	ID1	ID0
Host Line	DS0	DS1	DS2	MTRON
Function	A: / DF0	B: / DF1	DF2	Motor On

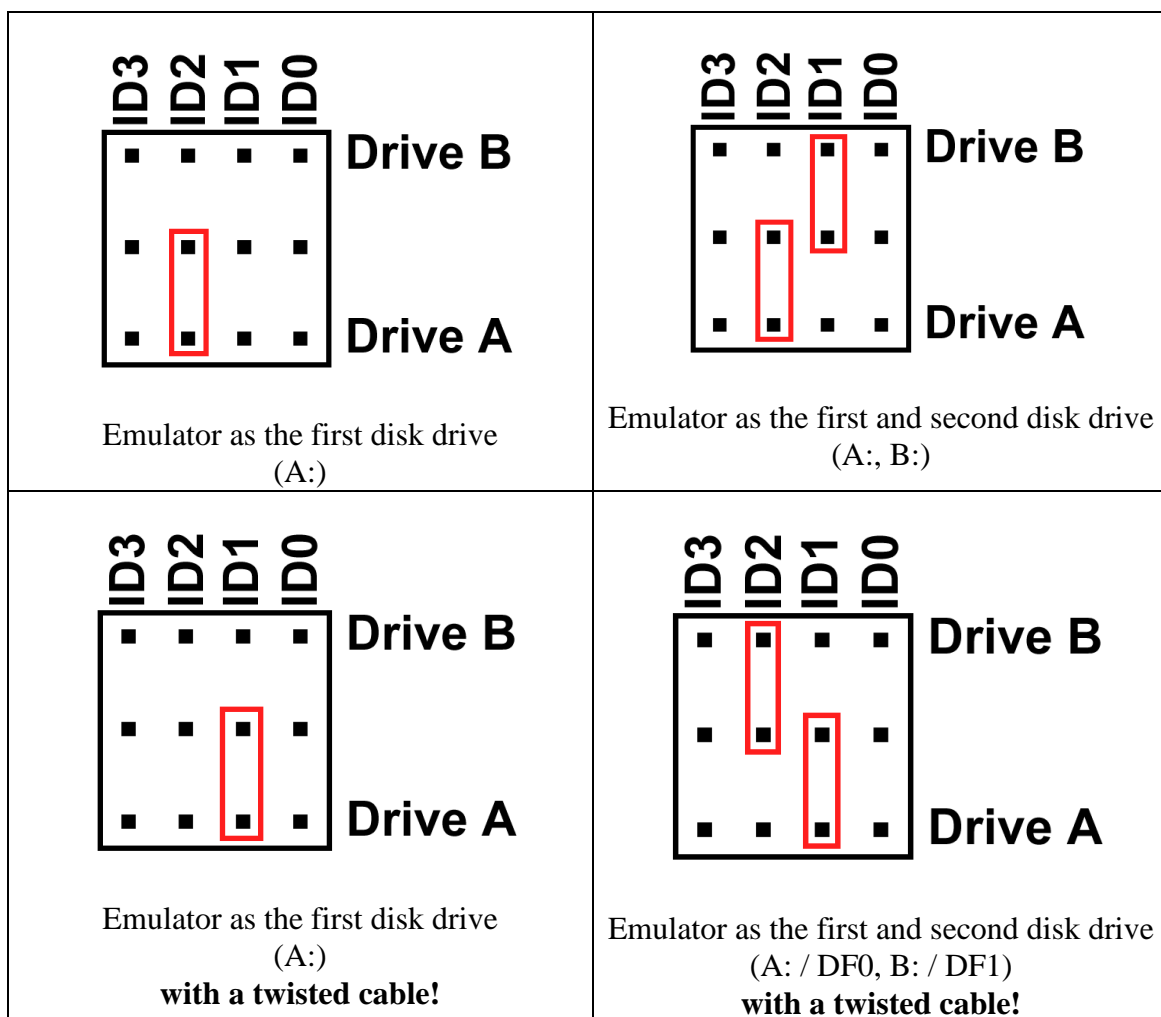


b. PC Compatible jumper settings

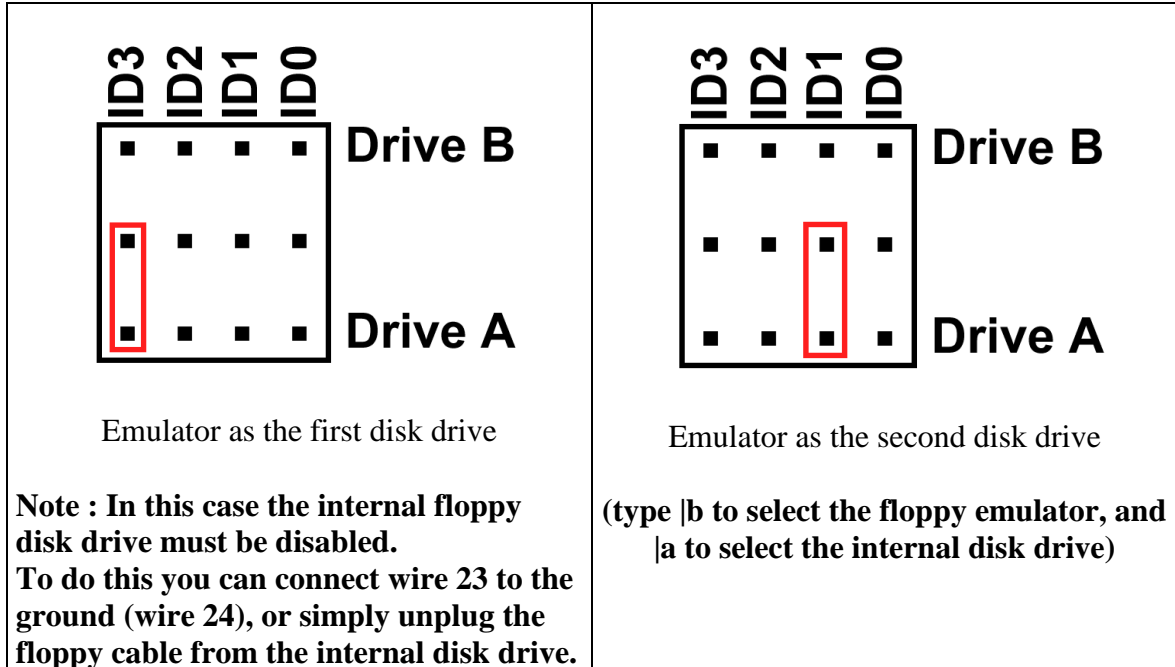
ID line	ID3	ID2	ID1	ID0
Host Line	/MOTEB	/DRVSA	/DRVSB	/MOTEA
Function	Motor Enable B	Drive Sel A:	Drive Sel B:	Motor Enable A

Note : If your are using a twisted floppy cable, the ID lines are inverted. In this case IDs lines meaning are changed:

ID line	ID3	ID2	ID1	ID0
Host Line	/MOTEA	/DRVSB	/DRVSA	/MOTEB
Function	Motor Enable A	Drive Sel B:	Drive Sel A:	Motor Enable B



c. Amstrad CPC6128 (External Floppy port connection) jumper settings



5) HxC Floppy Emulator software

The HxC Floppy Emulator software is a tool which allow you to convert or create Floppy Image files for the SD HxC Floppy Emulator.

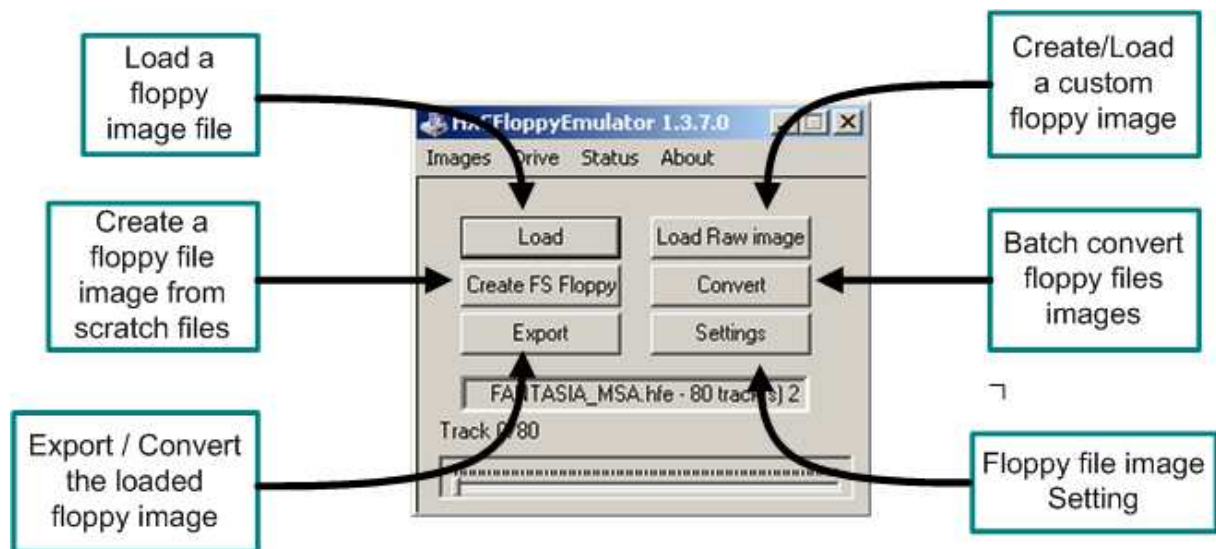


Figure 5 : HxC Floppy Emulator software functions

Below is the actual list of supported file images type:

*.ST, *.STT, *.MSA, *.ADF, *.ADZ, *.DMS, CPC DSK (standard and extended), CopyQM DSK, Oric DSK, *.IMG, *.SMC, MSX DSK, *.IMD, Zx Spectrum DSK, BetaDisk *.TRD, BetaDisk *.SCL, Thomson TO8D *.SAP, Thomson TO8D *.FD, Dragon 64 *.VDK, Sam Coupé *.MGT, Sam Coupé *.SAD, TI99 PC99, Apricot disk image, PC88 *.D88, x68000 *.HDM (beta), x68000 *.XDF (beta), Ensoniq EPS Keyboard *.EDE, Ensoniq Mirage Sampler *.EDM, Oberheim DPX1 Sampler *.DPX, Emax & Emax II Sampler *.EM1 and *.EM2, custom raw floppy geometry...

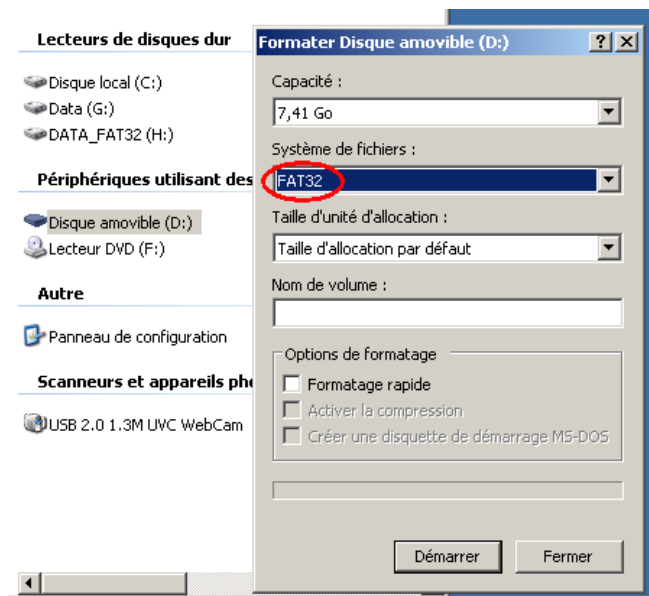
An AmigaDOS or FAT12 floppy disk image can also be generated from spares files (Create FS Floppy button).

(Note : New files/computers support are regularly added. Please checkout the project website for the lastest update : http://hxc2001.free.fr/floppy_drive_emulator/)

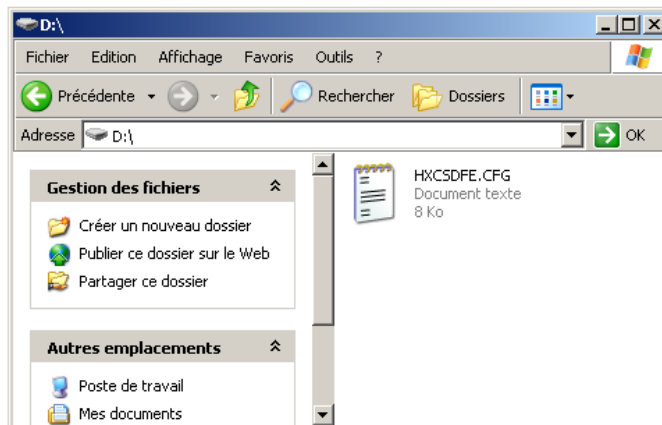
6) Step by Step operations

a. SDCard setup

1) Format the SDCard in FAT32



2) Copy the file HXCSDFE.CFG to this SDCard



After this the SDCard is usable with the SD HxC Floppy Emulator.
Now floppy file images can be copy to this SDCard .

Note: The HXCSDFE.CFG file can be created with the HxC Floppy Emulator software or can be found in the firmware zip file:

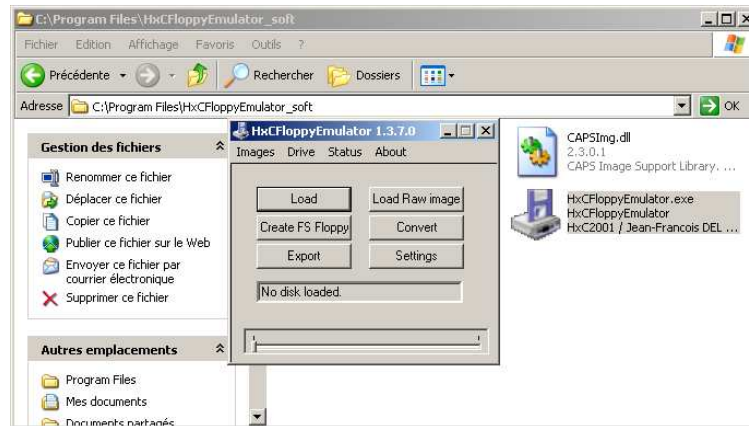
http://hxc2001.free.fr/floppy_drive_emulator/SDCard_HxCFloppyEmulator_firmware.zip

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http://hxc2001.free.fr/floppy_drive_emulator/
<http://torlus.com/floppy>

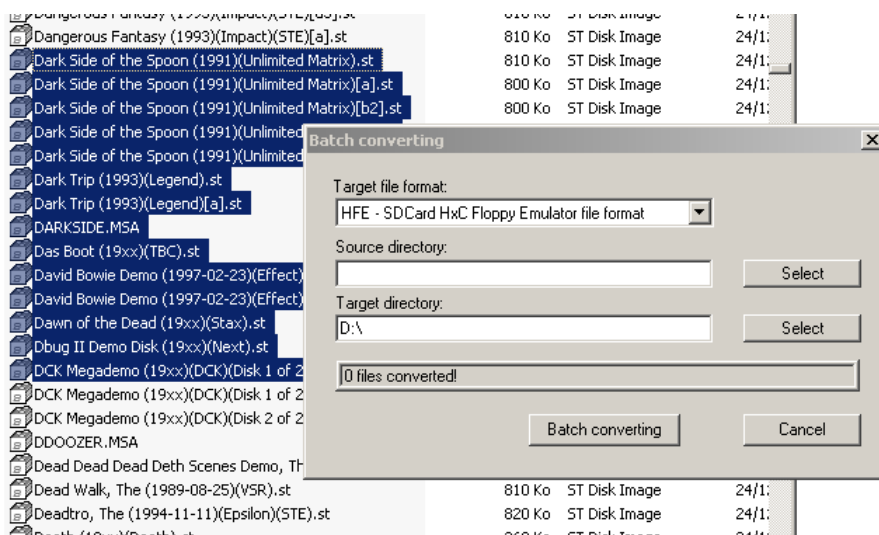
b. Convert/Copy floppy images to the SDCard

1) Start the HxC Floppy Emulator software

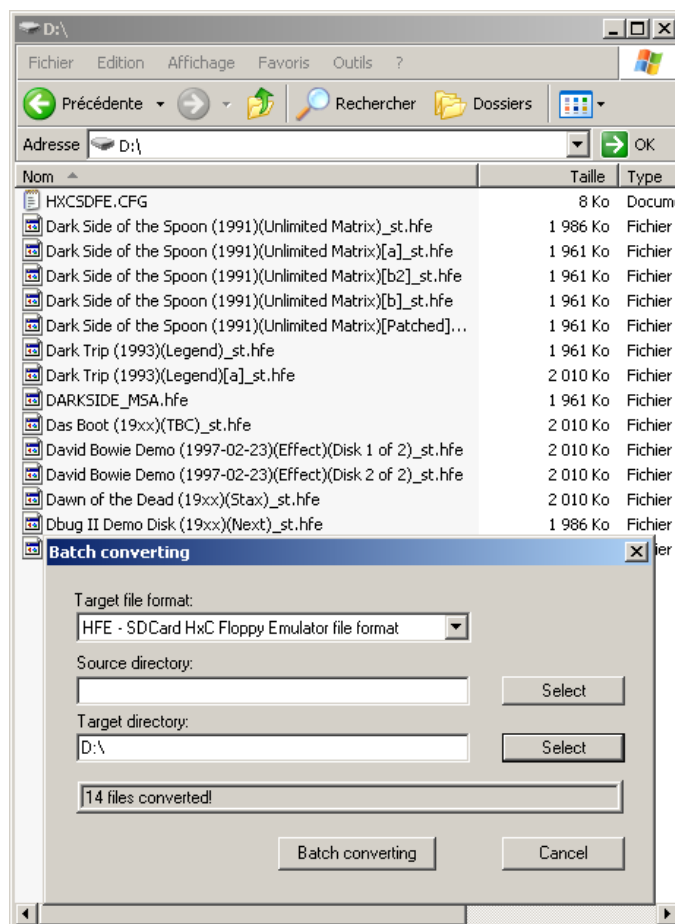


2) Use the “convert” function

- i. Choose the SDCard disk drive (D: here) as target directory.
- ii. Drag and drop on the window all floppy images you want convert to the SDCard.



Once done, the SDCard contains HFE floppy images. Now you can insert it in HxC Floppy Emulator.



Note 1: You can recursively convert a folder and its subfolders by specify its path in the “Source directory” field.

c. Insert the SDCard into the SD HxC Floppy Emulator

When you insert the SDCard in the emulator, this drive selector should appear. Select the disk drive you want use with buttons ◀ and ▶ and press ⬆ to confirm.



Figure 6 : Disk drive menu selector

You can now browse the SDCard with ◀ and ▶ buttons and ⬆ to enter a subfolder or load a floppy image disk.



Figure 7 : Browsing the SDCard


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http://hxc2001.free.fr/floppy_drive_emulator/
<http://torlus.com/floppy>




Figure 8 : Floppy image disk loaded

The floppy disk image is loaded and can be access by the host computer.

To eject the floppy disk image press  briefly.

You can also directly change floppy disk images by pressing  or  buttons.

If you want come back to the disk drive selector menu, in order to insert another floppy image to the other virtual disk drive, press  until this menu appear.

Note: The floppy write protect can be set/unset by using the SDCard write protect switch.



Figure 9 : SDCard write protect switch

7) Technical details

a. Floppy interface

- HE10 34 pins floppy connector
- Shugart compatible mode supported.
- PC compatible mode supported.
- 24mA driving capability.
- Tested on PC, Atari ST, Amiga, Amstrad CPC, Thomson, MSX, ZX Spectrum series computers.
- Two floppy disk drives emulation.
- 300 RPM , 360 RPM supported (others RPM possible).
- Up to 255 tracks
- Up to 2 Sides

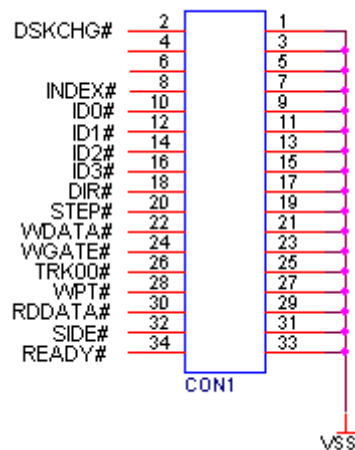


Figure 10 : Floppy connector pinout

b. Power supply

- 5V +/- 10% standard power floppy connector input.
- 500mA max current consumption.

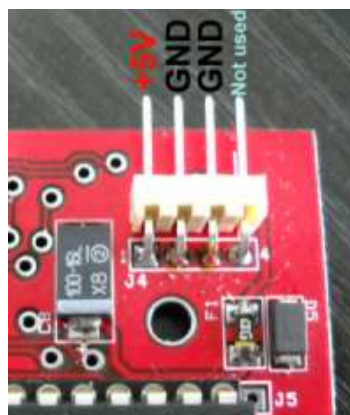


Figure 11 : Power connector pinout

c. User Interface

- 3 LEDs:
 - Power LED
 - Floppy access LED
 - SDCard access LED
 - 3 buttons ("Next", "Select/Eject", "Previous").
 - 1 audio transducer. (Head Step and User interface sound).
 - 2*16 chars Alphanumerical LCD.
- (Note : LCD and buttons can be put on an external front panel)
- On screen display software for Atari ST and Amstrad CPC computer (Amiga version planned).

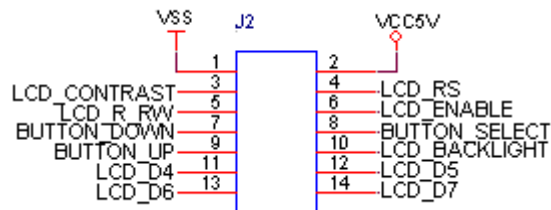


Figure 12 : Front panel connector pinout

d. SDCard support

- SD Card p to 2GB.
- SDHC Card supported up to 32GB.

(10Mhz SPI bus mode. Average byterate: ~500KB/s)

e. SDCard Filesystem

- FAT32 supported. Subdirectory and long name file supported.

f. Read / Write support

Track mode based floppy emulator (Full track pre-encoded in the HFE image file)

- Read support:
 - Most of existing formats (FM/MFM/Amiga track...) supported.
 - Custom tracks supported.
- Write support:
 - ISO MFM 256 Bytes-sector
 - ISO MFM 512 Bytes-sector
 - ISO MFM 1024 Bytes-sector
 - Amiga track write support (since the PCB revision C)

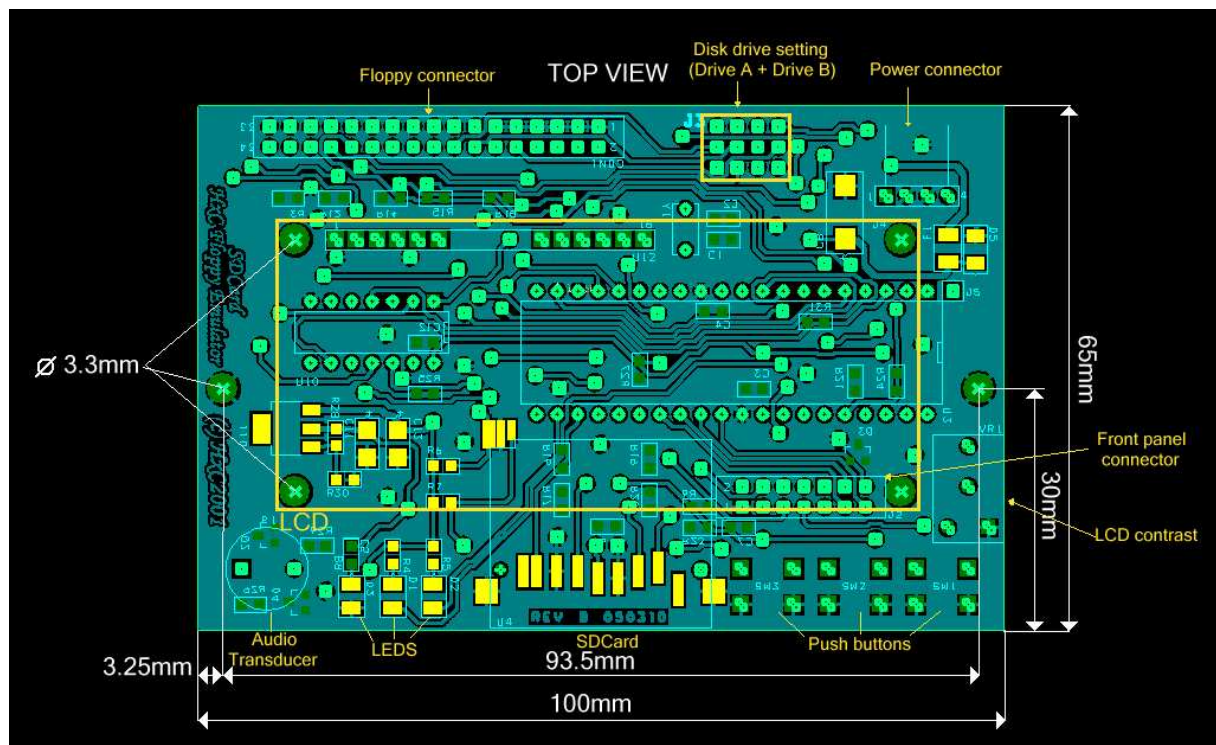
g. Floppy bitrate supported

- 250/300Kbits/s (DD floppies)
- 500Kbits/s (HD floppies)
(others bitrates possible)

(Note : Variable bitrate not supported for the moment. So protected floppy disk image (IPF and STX file format) file support will be only partial ! If you look for a device supporting IPF / STX please have a look to the [USB HxC Floppy Emulator device](#))

h. Additional features

- Firmware update via the SDCard.
- Last Loaded Floppy Image autostart at power up.
- Fast floppy image loading (<<1second), no conversion time.
- SDCard Direct Access mode : Floppy to SD bridging.

i. Mechanical drawing

8) Stay tuned !

The Software and Firmware are regularly updated to add new features and correct bugs.

To get the latest version of the software and firmware please visit the project website:

http://hxc2001.free.fr/floppy_drive_emulator

To report problems and/or bugs please go to the project forum :

<http://www.torlus.com/floppy/forum>