

Slim SD HxC Floppy Emulator

User Manual



Slim SD HxC Floppy Emulator User Guide Disclaimer

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HxC Floppy Emulator Project

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1 Board Interfaces

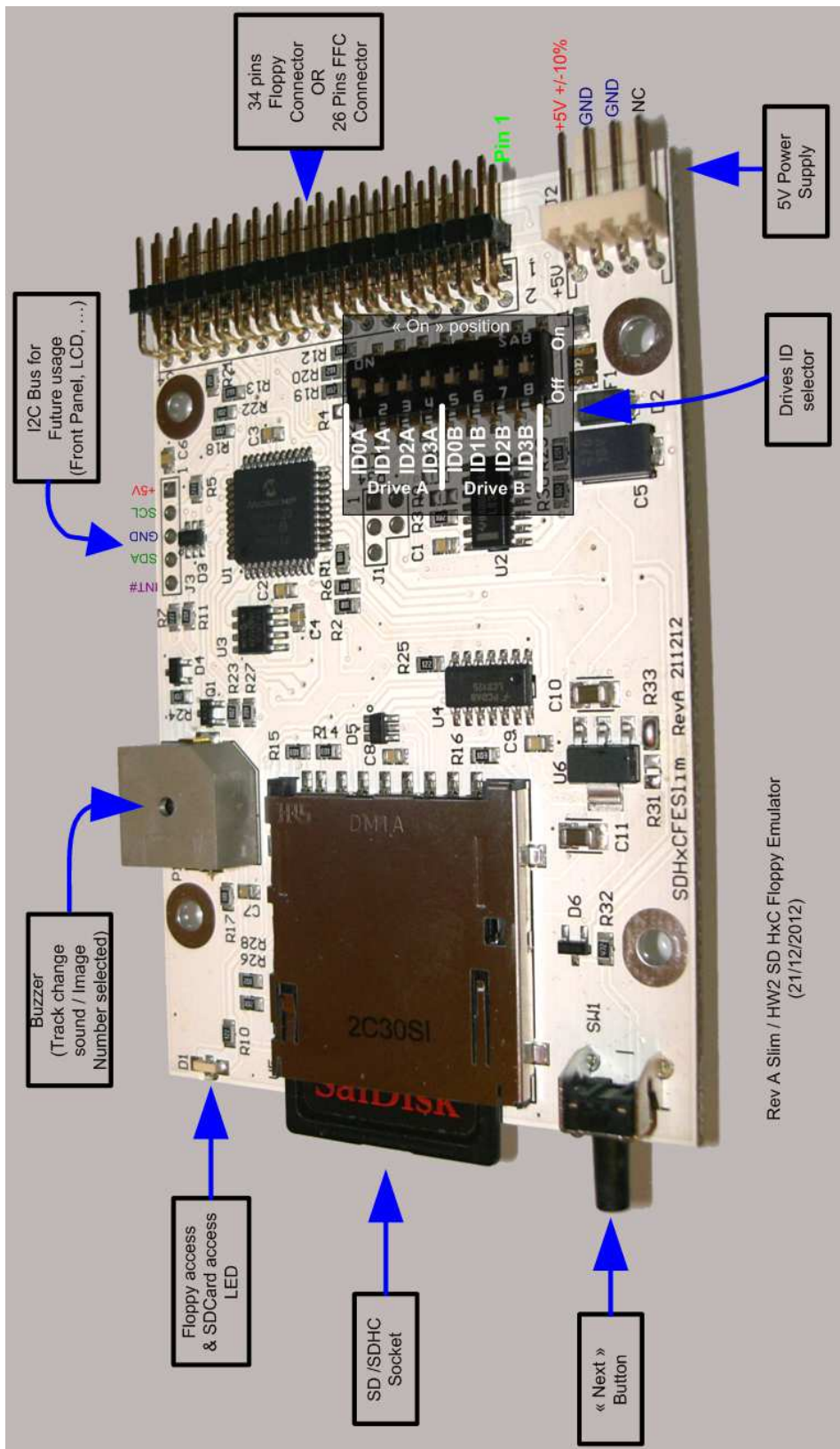


Figure 1 : Board Interfaces



2 Board setup

2.1 Power supply

The SD HxC Floppy Emulator need a **+5V** power source to work.

The power source must be able to deliver at least 300mA for proper operations (100mA for the SD HxC Floppy Emulator and 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.

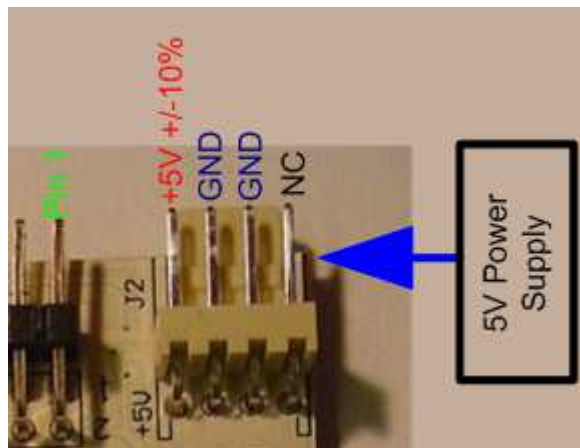


Figure 2 : Power supply connector pinout



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. Some systems doesn't use the standard pinout : +5V and +12V power supply lines can be reversed.



2.2 Switches settings

Here is the jumper configuration settings:

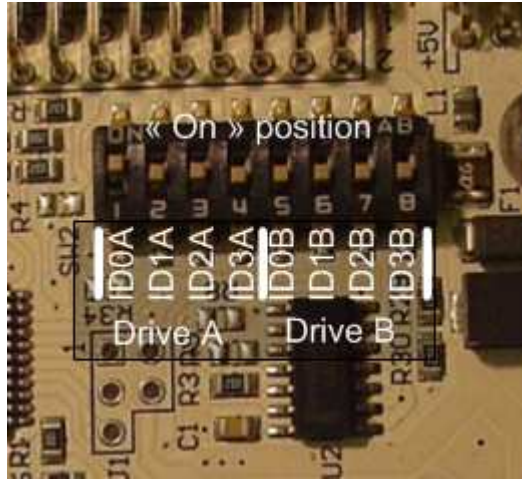


Figure 3 : Switchs settings

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 settings :”**Drive A**” and “**Drive B**”.

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

If you are using the 26 pins FPC version ID0A must be to be set to ON.

Depending of the host computer type and the floppy cable used (twisted or not), the meaning of the IDx switches may change. Below you can see some examples of switches settings.



2.2.1 Shugart switches settings

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

Table 1 : Shugart jumper setting

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

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

Table 2 : Shugart jumper setting (twisted floppy cable)

In most cases to emulate the first drive on a Shugart compatible machines and a non-twisted floppy cable ID0A must set to ON. To emulate the second drive ID1A must be set to ON. Others switches position must be set to OFF.

2.2.2 PC Compatible switches settings

| Switches | ID0 A/B | ID1 A/B | ID2 A/B | ID3 A/B |
|-----------|----------------|--------------|--------------|----------------|
| Host Line | /MOTEA | /DRVSB | /DRVSA | /MOTEB |
| Function | Motor Enable A | Drive Sel B: | Drive Sel A: | Motor Enable B |

Table 3 : PC jumper setting

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

| Switches | ID0 A/B | ID1 A/B | ID2 A/B | ID3 A/B |
|-----------|----------------|--------------|--------------|----------------|
| Host Line | /MOTEB | /DRVSA | /DRVSB | /MOTEA |
| Function | Motor Enable B | Drive Sel A: | Drive Sel B: | Motor Enable A |

Table 4 : PC jumper setting (twisted floppy cable)

In most cases to emulate the first drive on a PC compatible machines and a non-twisted floppy cable ID2A must set to ON. To emulate the second drive ID1A must be set to ON. Others switches position must be set to OFF.



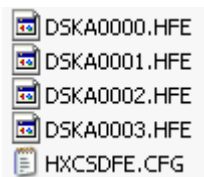
3 Quick usage guide

The Slim SD HxC Floppy Emulator use the HFE file images format. Each file image present on the SD Card is a virtual floppy disk.

From the user point of view the Slim SD HxC Floppy Emulator have mainly two modes of operation :

→ Indexed Mode

In this mode each file image must named with the format “DSKAXXXX.HFE” . The XXXX must be replaced by the index number.



Once the SD Card is in the emulator, the button allows you to select the next file image. Once the last file is reached, the next one will be DSKA0000.HFE.

To jump to the first image (DSKA0000.HFE) from any index position, you have just to push the button more than one second.

To activate the second drive emulation, you have just to add a file image named DSKBXXXX.HFE (XXXX is the index number).

As example a ready to use set of 1.44MB DOS images can be downloaded here:
http://hxc2001.com/download/floppy_drive_emulator/Slim_SDHXCFE_DOSHD.zip

You have just to unpack this archive to the root a SD Card. After this the SD Card is ready to be used into the Slim SD HxC Floppy Emulator.

→ File selector mode

With some machine it is possible to use the file selector mode. In this mode an software executed by the host machine allows you to select any image file to load.

You have just to copy the AUTOBOOT.HFE and HXCSDFE.CFG to your FAT32 formatted SD Card :

http://hxc2001.com/download/floppy_drive_emulator/SDCard_HxC_Floppy_Emulator_Manager.zip



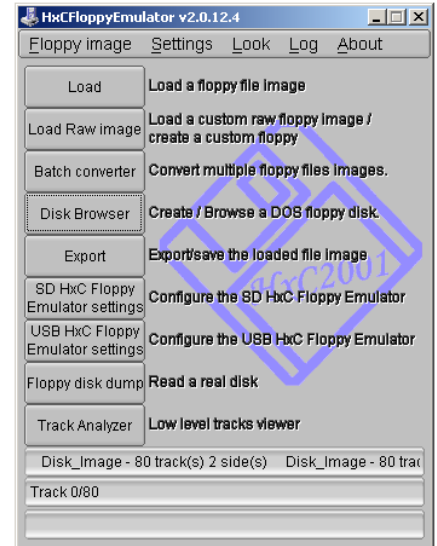
4 Tools

Different tools are available to manage your file images :

→ HxC Floppy Emulator software

This software allows you to :

- Convert a large diversity of file image type.
- Batch convert a large quantity of file images.
- Generate empty floppy disks images.
- Read your floppy disks and generate a file image.
- Add/Read/Remove files from an DOS floppy Image.
- Do some low level track analysis.



This tool can be downloaded here :

http://hxc2001.com/download/floppy_drive_emulator/HxCFloppyEmulator_soft.zip

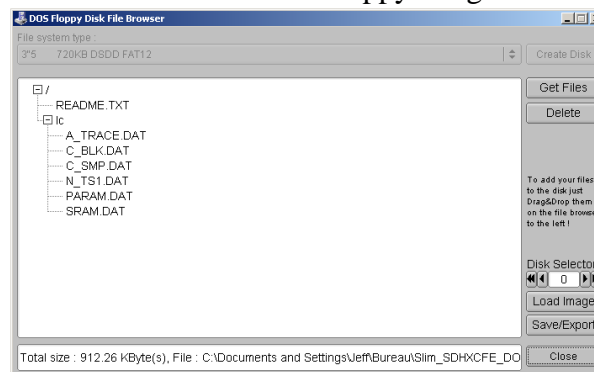
To have more help about the usage of this software please have a look to this document :

http://hxc2001.com/download/floppy_drive_emulator/HxC_Floppy_Emulator_Software_User_Manual_ENG.pdf

→ DOS Floppy disk file Browser

This simplified software allows you to :

- Easily Add/Read/Remove files from an DOS floppy Image.



This tool can be downloaded here :

http://hxc2001.com/download/floppy_drive_emulator/HxCFE_DosDiskBrowser.zip

More software tools can be downloaded at this address :

http://hxc2001.com/download/floppy_drive_emulator/index.html



5 Specifications

5.1 Floppy interface

- HE10 34 pins floppy connector.
- 1mm 26pins FPC floppy connector.
- Shugart compatible mode supported.
- PC compatible mode supported.
- 24mA driving capability.
- Default termination pull-ups : 1KOhms
- Up to two floppy disk drives emulation.
- 300 RPM , 360 RPM supported (others RPM possible).
- Up to 255 tracks
- Up to 2 Sides

5.2 Power supply

- 5V +/- 10% standard power floppy connector input.
- 500mA max current consumption. (Standby :100mA, RD/WR:170mA min – 450mA max. depend of the SD Card)

5.3 User Interface

- 1 LED:
 - Floppy access / SD Card access LED
- 1 Button ("Next").
- 1 Audio transducer (Head Step and User interface sound).
- I2C Expansion Bus (Front panel / LCD connection)
- On screen display software available for Amiga, Atari ST and Amstrad CPC computer.

5.4 SD Card support

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

5.5 SD Card Filesystem

- FAT12,FAT16 & FAT32 supported.
- Subdirectory and long name file supported.



5.6 Read / Write support

Low level 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.
 - Mixed sector size and geometry supported.
- Write support:
 - Low level Format write support ! :
 - The host machine can format the image with the right disk setup exactly as with a real floppy disk ! No need to already have an image with the right format, just make it by formatting it !
 - Any ISO MFM (DD/HD) sector size supported ! :
 - 128, 256, 512, 1024, 2048, 4096, 8192 Bytes-sector
 - Any ISO FM (SD) sector size supported ! :
 - 128, 256, 512, 1024, 2048, 4096, 8192 Bytes-sector
 - Any data mark supported : 0xFB,0xF8,0xF9,0xFA
 - Amiga track write support.
 - E-mu track write support.

5.7 Floppy bitrate supported

- 125/150/250Kbits/s (FM/SD floppies)
- 250/300Kbits/s (MFM/DD floppies)
- 500Kbits/s (HD floppies)
(others bitrates possible)

5.8 Additional features

- Firmware update via the SD Card.
- Last Loaded Floppy Image autostart at power up.
- Fast floppy image loading into the emulator (<<1second), no loading / conversion time.
- SD Card Direct Access mode : Direct Floppy to SD bridging.
- Host control : The host machine can send a command to the emulator to change the current selected image.
- Supersized DOS Floppy emulation! : Up to 5 MB per floppy image!
- Data integrity security of the original system respected ! : CRC fields present into the HFE images. No direct usage of not secured IMG/IMA/"ISO" images or direct flash media bridging without CRC in floppy emulation mode !



6 Supported Computer / Keyboards / Machines list

The currently tested Computer / Keyboard / Samplers / CNC / Robot list can be found at this address :

http://hxc2001.com/download/floppy_drive_emulator/support.htm

If your hardware is not in this list, feel free to contact us, we will evaluate the compatibility with the SD HxC Floppy Emulator.

Also don't forget to visit our showroom :

<http://hxc2001.com/showroom/index.html>



7 Board mechanical drawing

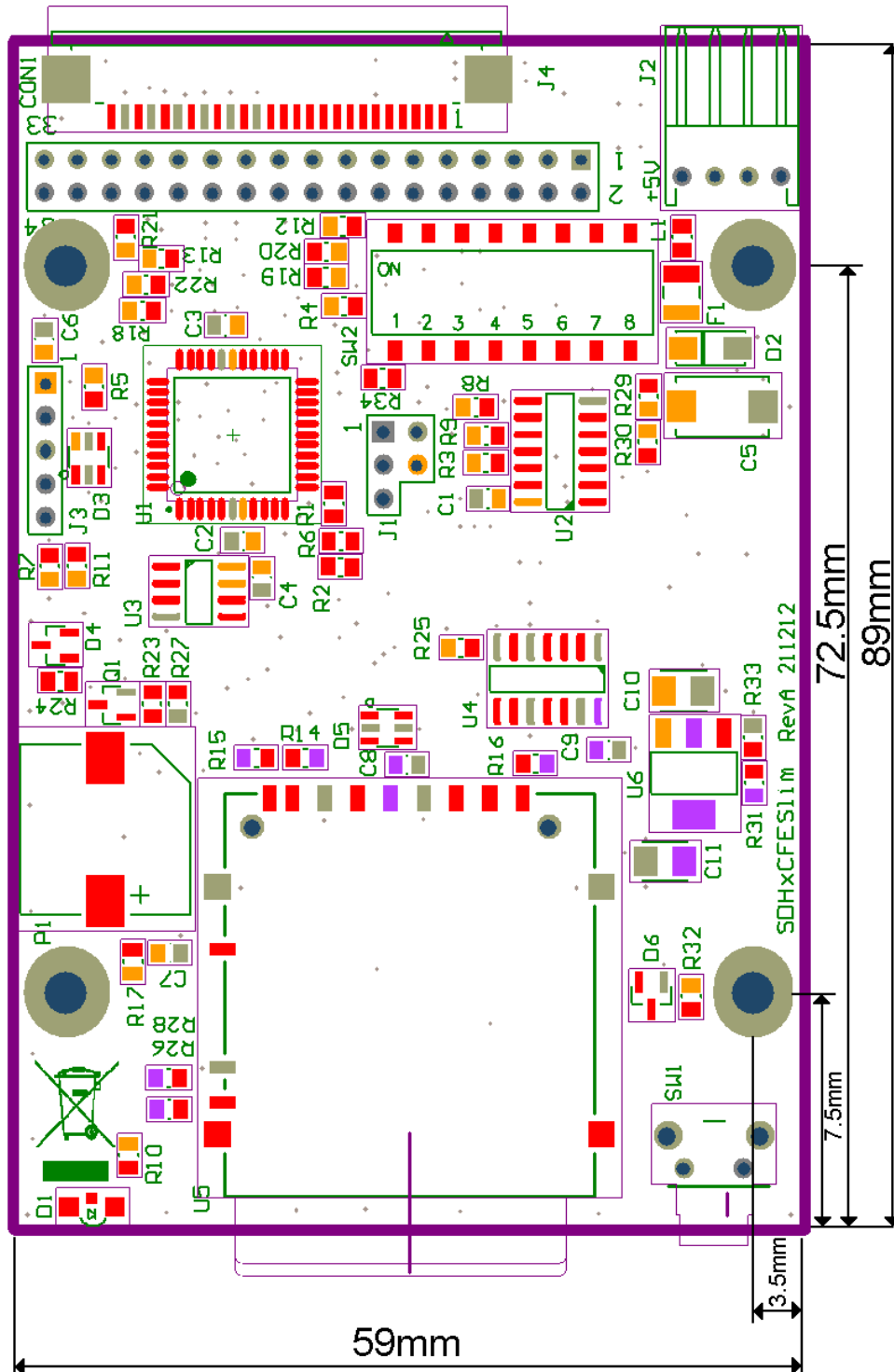


Figure 4 : Board mechanical drawing



8 Floppy interface pinout

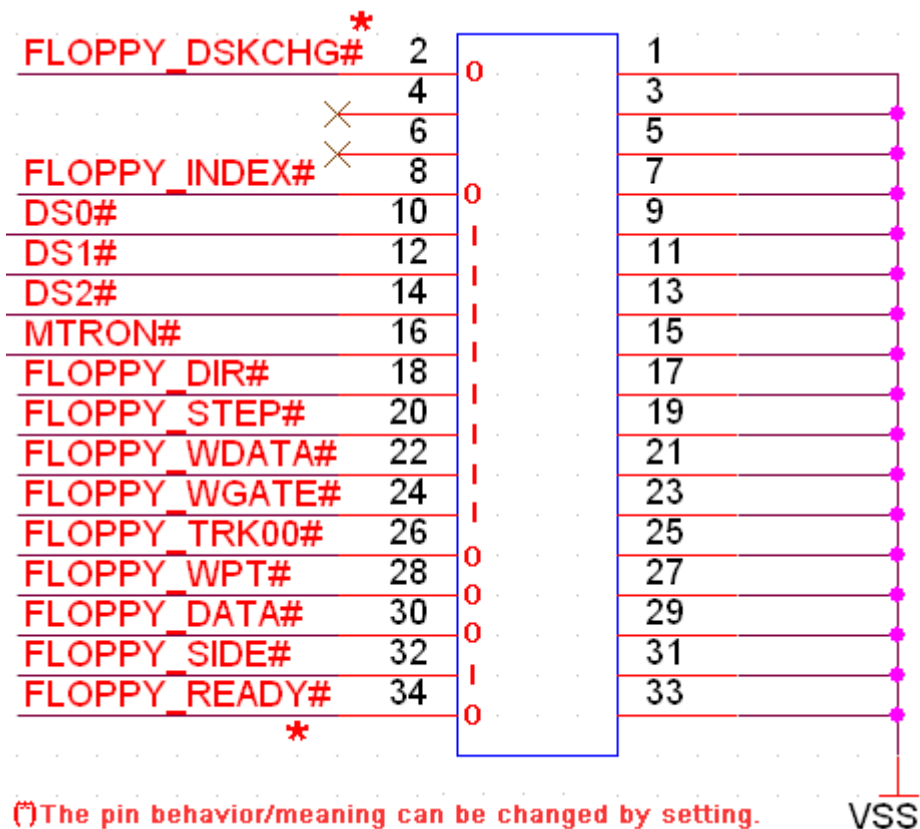


Figure 5 : HE10-34 Floppy connector pinout



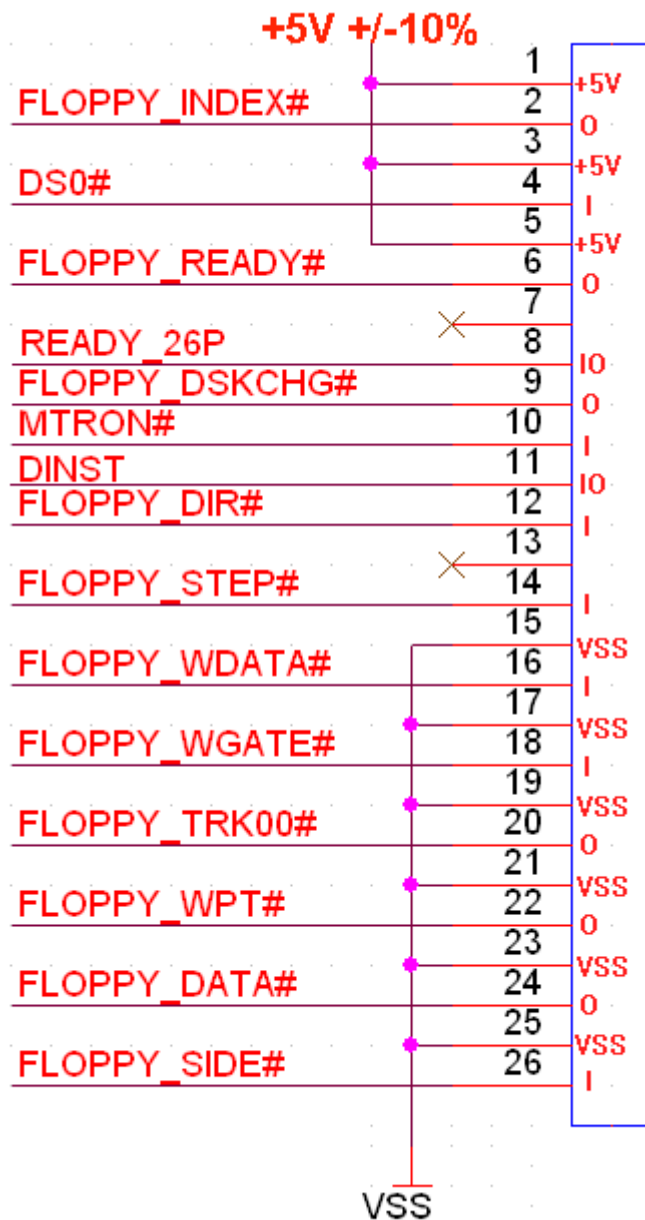


Figure 6 : 1mm 26 pins FPC Floppy connector pinout



9 Contact / Project page

The Software and Firmware are regularly updated.

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

<http://hxc2001.com>

To report problems or issue please go to the project support forum :

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

or contact us by email:

**HxC Floppy Emulator project initiator,
Software development, Hardware design, Technical support :**



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