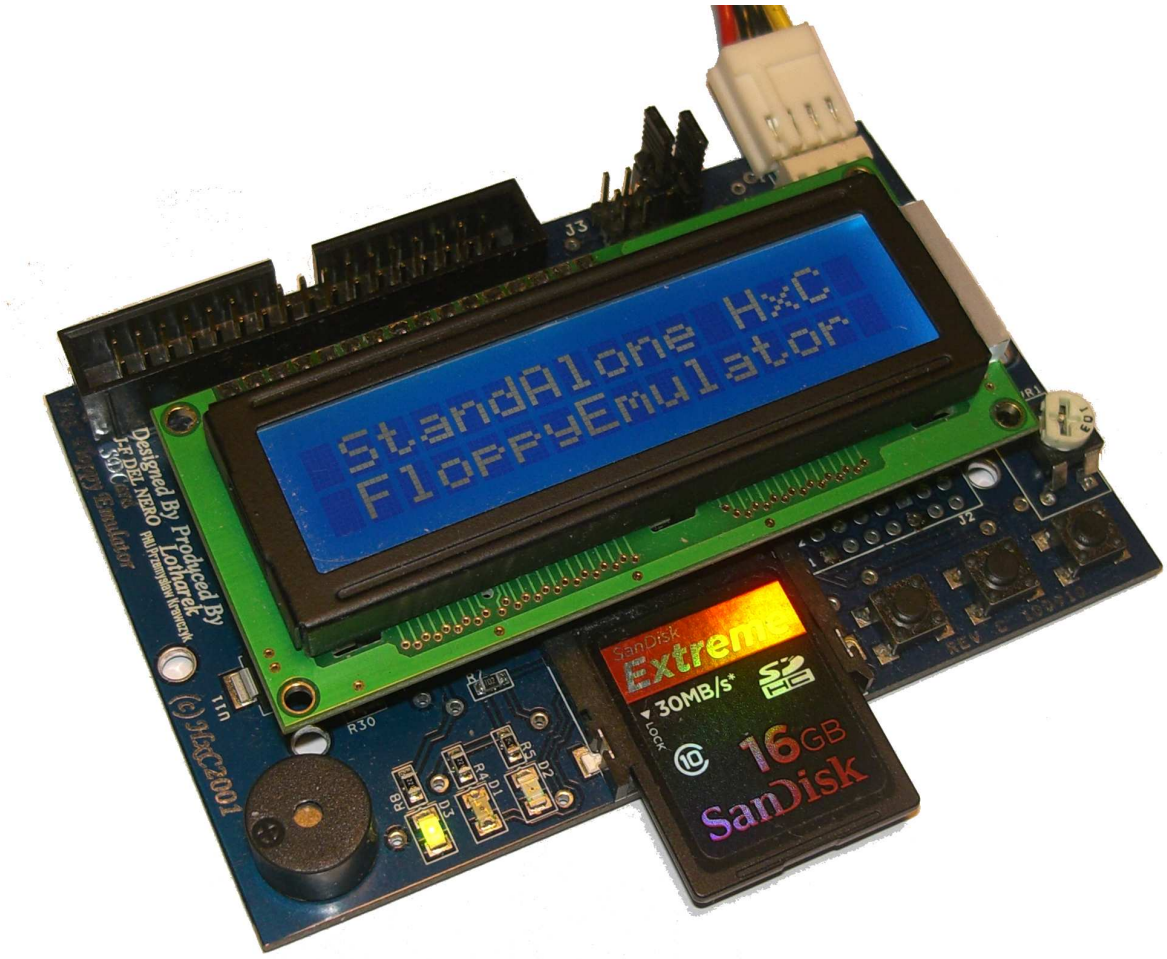
SDCard HxC Floppy Emulator

Manuel Utilisateur



SDCard HxC Floppy Emulator User Guide Disclaimer

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SDCard HxC Floppy Emulator User Guide issued August 2011.

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1 Description générale / matériel nécessaire

Le SD HxC Floppy Emulator est un émulateur de disquette universel utilisant des cartes SD/SDHC comme support mémoire.

Pour l'utiliser pleinement il est recommandé d'avoir :

- Un ordinateur/périphérique/sampler/synthétiseur avec une interface de lecteur de disquette compatible Shugart ou PC.
- Une carte mémoire SD ou SDHC (capacité allant de 64MB à 32GB).
- Un PC pour préparer les fichiers images disque et les copier sur la SD Card.

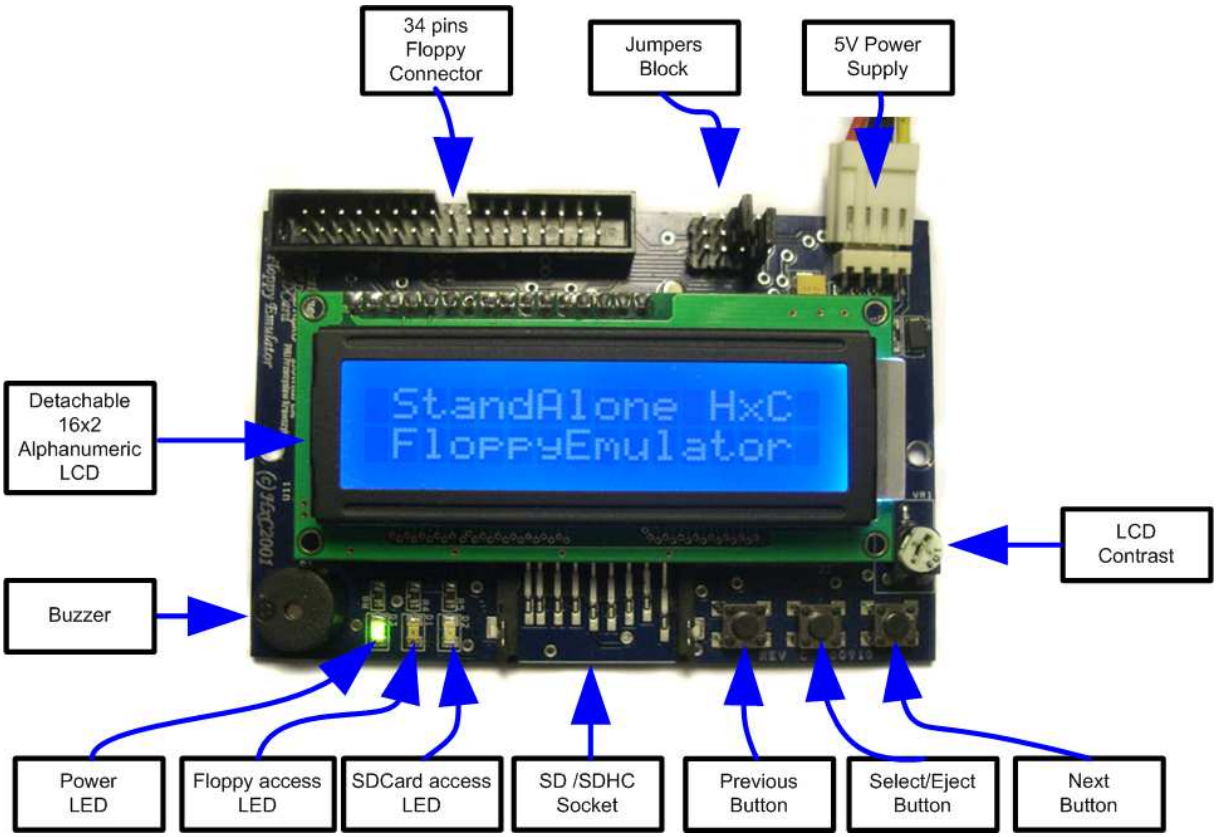


Figure 1 : Le SD HxC Floppy Emulator

2 Installation / configuration matériel

2.1 Alimentation

L'émulateur a besoin d'une alimentation 5V pour fonctionner.
L'alimentation doit être capable de délivrer au minimum 500mA pour garantir un fonctionnement normal de l'émulateur. (200mA pour l'émulateur HxC Floppy Emulator et 200mA pour la SD Card).
Le connecteur utilisé est un connecteur standard 4 points couramment utilisé sur les lecteurs de disques.
L'alimentation +12V n'est pas nécessaire pour l'émulateur.

Ci-dessous le brochage du connecteur d'alimentation :

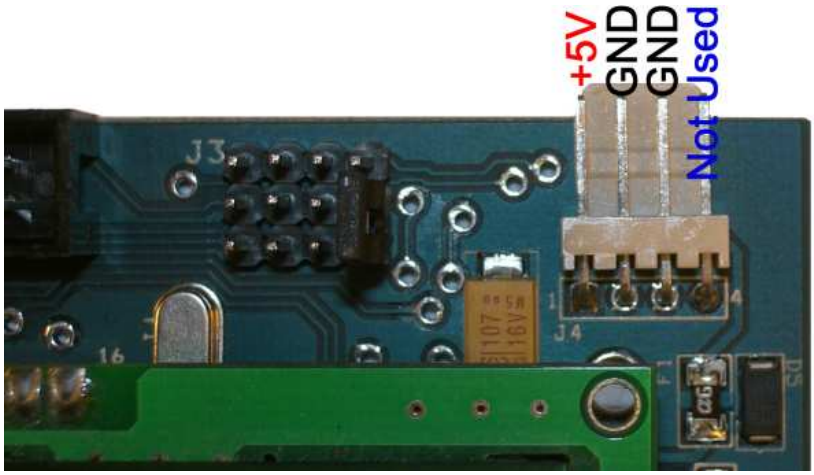


Figure 2 : Brochage du connecteur d'alimentation

Une attention particulière doit être prise lors du branchement de l'alimentation. En effet certains systèmes n'utilisent pas un brochage standard : les broches +5V et +12V peuvent être inversées. L'émulateur et l'ordinateur peuvent être endommagés en cas d'erreur de branchement.

Utilisateurs d'Amstrad CPC6128 : Le connecteur d'alimentation du lecteur de disquette du CPC6128 a un brochage inversé : +5V et +12V sont intervertis. Contrairement aux autres systèmes : Fil Orange=5V, Fil Rouge=12V, Fils noirs=GND. Une attention particulière doit être prise lors du branchement de l'alimentation sur le CPC6128. Pour tester l'émulateur en toute sécurité, il est conseillé de déconnecter la source d'alimentation +12V du CPC. Cette alimentation n'est pas nécessaire avec l'émulateur.

2.2 Connexion de l'interface lecteur de disquette

Une nappe de lecteur de disquettes à 34 broches doit être utilisée pour relier l'émulateur à la machine hôte.

Un câble twisté ou non peut être utilisé.

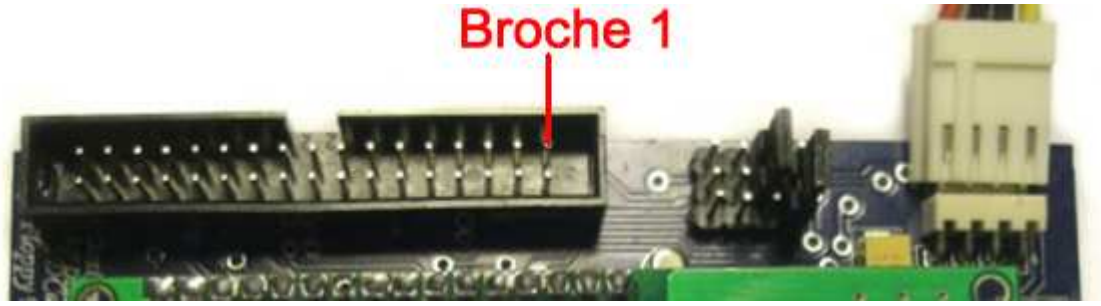


Figure 3 : Le connecteur d'interface de l'émulateur.

Note 1 : Dans la plupart des cas, la broche 1 est indiquée par le fil rouge sur la nappe du lecteur de disquette. Dans ce cas la nappe peut être branchée directement (fil rouge au niveau de la broche 1 sur la droite).

Note 2 : Dans certains cas (Amiga,…), le sens de la nappe est inversée (le fil rouge n'indique pas la broche 1). Donc la broche 1 est à l'opposé du fil rouge. Dans ce cas, la nappe doit être connectée à l'émulateur dans le sens inverse (fil rouge à gauche) ou bien connecter la nappe dans le bon sens sur la carte mère.

Note 3 : Si vous utilisez le port d'interface de lecteur disquette de l'**Amstrad CPC6128**, vous pouvez connecter la nappe dans le sens inverse de l'émulateur (fil rouge à gauche).
Pour mettre l'émulateur en premier lecteur de disquette et désactiver le lecteur interne, la broche 23 doit être connectée à la masse (en utilisant la broche 24 par exemple).

Note 4 : Si après avoir mis les cavaliers, la LED d'accès à la disquette est toujours allumée, cela veut probablement dire que la nappe est inversée (les signaux de sélections du lecteur sont connectés à la masse).

2.3 Configuration des cavaliers

Voici la configuration des cavaliers :

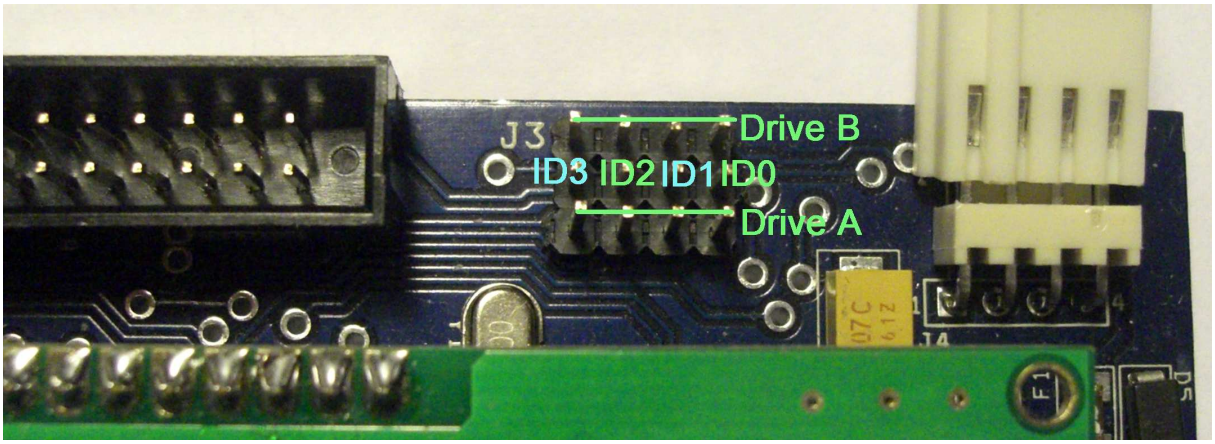


Figure 4 : Configuration des cavaliers

Pour utiliser l'émulateur, vous devez assigner au moins un identificateur de lecteur (ID drive) à l'émulateur. Comme l'émulateur est capable d'émuler deux lecteurs de disquettes, deux rangées de réglage jumper sont présentes sur l'émulateur : Lecteur A (Drive A) et Lecteur B (Drive B).

Contrairement au vrai lecteur disquette, le SD HxC Floppy Emulator n'utilise pas la ligne de contrôle moteur. Donc il n'y a qu'un seul cavalier par lecteur virtuel à configurer.

Selon le type d'ordinateur hôte et le type de nappe de lecteur disquette utilisé (inversée ou non), la configuration des cavaliers peut changer. Ci-dessous vous pouvez voir quelques exemples de configuration de cavaliers.

2.3.1 Configuration des cavaliers pour Atari ST / Amiga / Shugart

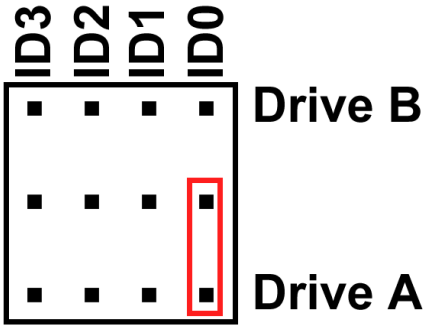
Ligne ID	ID3	ID2	ID1	ID0
Ligne Hôte	MTRON	DS2	DS1	DS0
Fonction	Moteur activé	DF2	B: / DF1	A: / DF0

Table 1 : Configuration des cavaliers pour Shugart

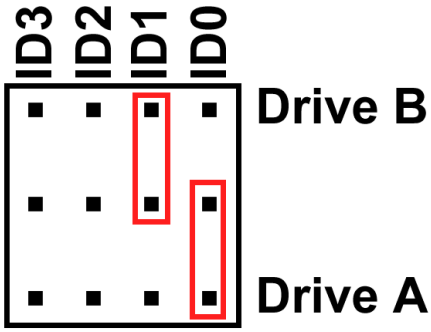
Note : Si vous utilisez une nappe de lecteur disquette avec les signaux de sélections inversés (nappe « twisted ») la signification des cavaliers change :

Ligne ID	ID3	ID2	ID1	ID0
Ligne Hôte	DS0	DS1	DS2	MTRON
Fonction	A: / DF0	B: / DF1	DF2	Moteur activé

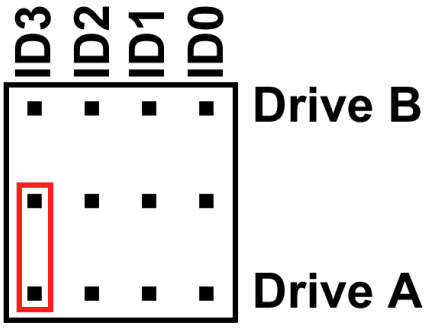
Table 2 : Configuration des cavaliers pour Shugart (cable inversé)



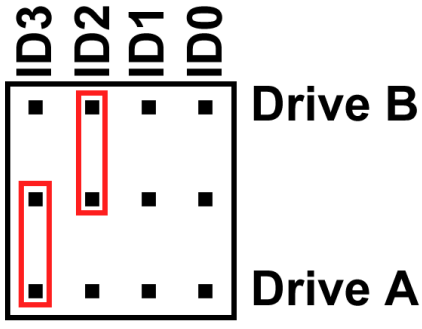
Emulation du premier lecteur
(A: / DF0)



Emulation du premier et du second lecteur
(A: / DF0, B: / DF1)



Emulation du premier lecteur
(A: / DF0)
avec une nappe twistée!



Emulation du premier et du second lecteur
(A: / DF0, B: / DF1)
avec une nappe twistée!

2.3.2 Configuration des cavaliers pour Compatible PC

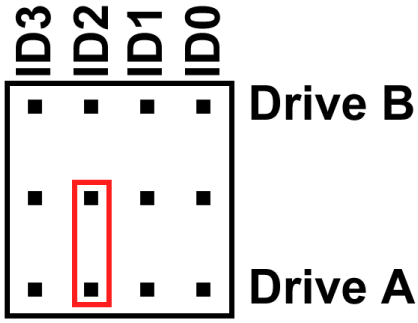
Ligne ID	ID3	ID2	ID1	ID0
Ligne Hôte	/MOTEB	/DRVSA	/DRVSB	/MOTEA
Fonction	Moteur B activé	A :	B :	Moteur A activé

Table 3 : Configuration des cavaliers avec un PC

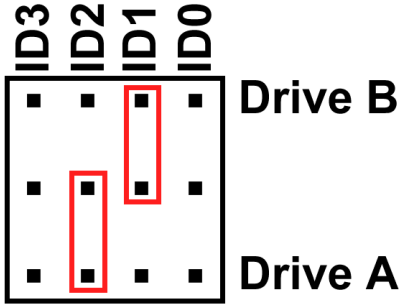
Note : Si vous utilisez une nappe de lecteur disquette avec les signaux de sélections inversés (nappe « twisted ») la signification des cavaliers change :

Ligne ID	ID3	ID2	ID1	ID0
Ligne Hôte	/MOTEA	/DRVSB	/DRVSA	/MOTEB
Fonction	Moteur A activé	B :	A :	Moteur B activé

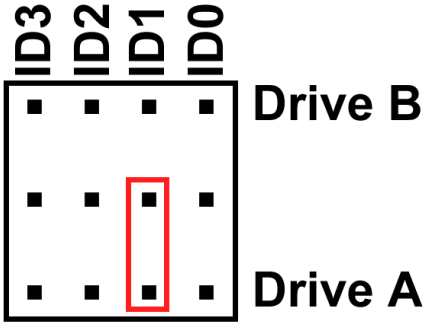
Table 4 : Configuration des cavaliers avec un PC (cable twisté)



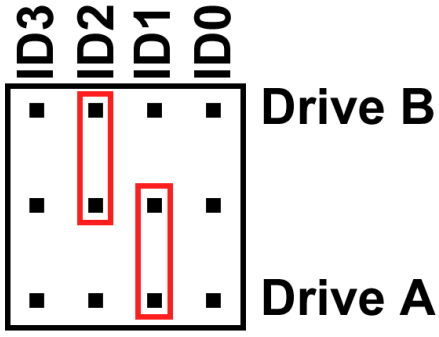
Emulation du premier lecteur
(A: / DF0)



Emulation du premier et second lecteur.
(A: / DF0, B: / DF1)



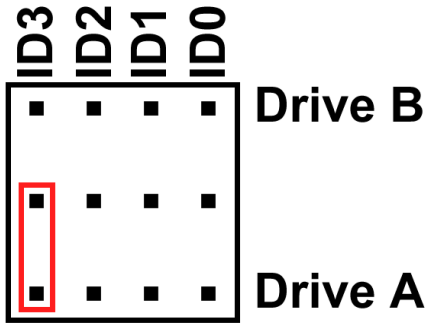
Emulation du premier lecteur
(A: / DF0)
avec une nappe twistée!



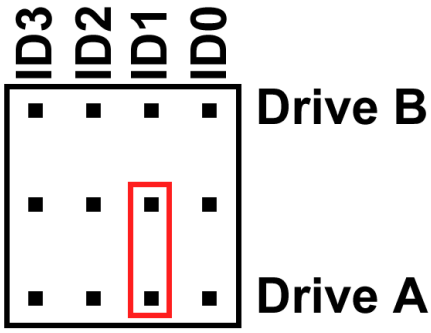
Emulation du premier et second lecteur.
(A: / DF0, B: / DF1)
avec une nappe twistée!

2.3.3 Configuration des cavaliers pour Amstrad CPC6128

Ci-dessous les configurations possibles pour Amstrad CPC 6128 (sur port externe)

<table>
<tr>
<td> 

Emulation du premier lecteur

Note : Dans ce cas le lecteur interne doit être désactivé. Pour cela vous pouvez connecter le fil 23 à la masse (fil 24 par exemple) ou simplement débrancher la nappe du lecteur interne.</td>
<td> 

Emulation du second lecteur

(Tapez |b pour sélectionner l’émulateur, et |a pour sélectionner le lecteur interne)</td>
</tr>
</table>

3 Guide d'utilisation pas à pas

Ce qui va suivre vous guidera dans vos premières utilisations.

3.1 Installation

Retirez/déconnectez le lecteur de disquette présent dans votre équipement et connectez le SD HxC Floppy Emulator.

Voir " Installation / configuration matériel" (Page 6) pour plus de détails sur les branchements.

3.2 Préparation de la carte SD

► Formater la carte SD en FAT32

Pour utiliser la carte SD avec le SD HxC Floppy Emulator, elle doit être formatée en **FAT32**. Les autres systèmes de fichier ne sont actuellement pas supportés.

Donc la première chose à faire est de formater la carte SD en FAT32 :

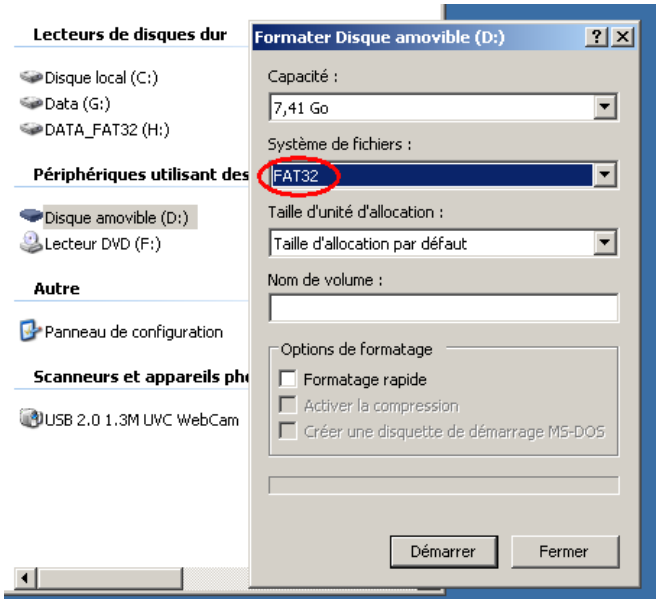


Figure 5 : Formatage de la carte SD en FAT32

►Copier le fichier HXCSDFE.CFG sur la carte SD

Le SD HxC Floppy Emulator a besoin du fichier HXCSDFE.CFG sur la carte SD. Ce fichier contient la configuration de l'émulateur et le chemin de la dernière image utilisée.

Le fichier HXCSDFE.CFG peut être créé avec le logiciel HxC Floppy Emulator ou peut être trouvé dans l'archive du firmware :
http://hxc2001.free.fr/floppy_drive_emulator/SDCard_HxCFloppyEmulator_firmware.zip

Pour plus d'informations sur la configuration du SD HxC Floppy Emulator voir le chapitre Fenêtre de configuration du SD HxC Floppy Emulator (page 20).

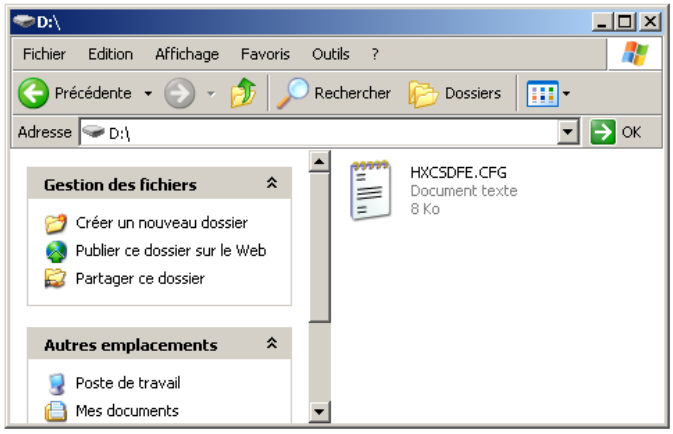


Figure 6 : Copier le fichier HXCSDFE.CFG sur la carte SD

Après cela, vous pouvez copier les fichiers images disques.

Note : Si vous voulez utiliser un logiciel de sélection d'image, copiez le fichier AUTOBOOT.HFE correspondant après avoir copié le fichier HXCSDFE.CFG.
Pour plus de détail voir le chapitre Logiciel de sélection d'image (page 25).

3.3 Conversion/copie des images disques sur la carte SD

Le logiciel HxC Floppy Emulator vous permet de créer, convertir et gérer les images des disquettes virtuelles pour le SD HxC Floppy Emulator.
Ce logiciel peut être démarré en double-cliquant sur l'exécutable HxCFloppyEmulator.exe.

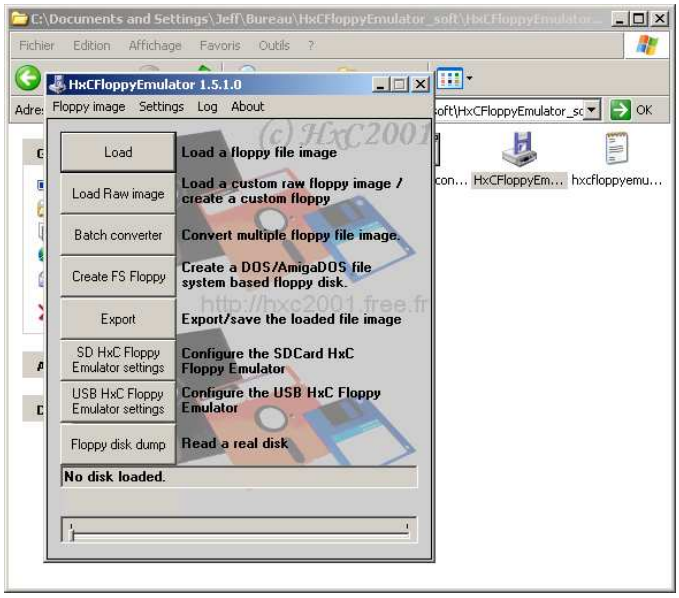


Figure 7 : Menu principal du logiciel HxC Floppy Emulator

Pour convertir vos fichiers images, deux possibilités s'offrent à vous :

► Utilisation du convertisseur automatique

Pour convertir une quantité importante d'image, le convertisseur en batch est recommandé. Le bouton <<Batch converter>> permet d'accéder à cette fonctionnalité. La fenêtre suivante apparaît alors :

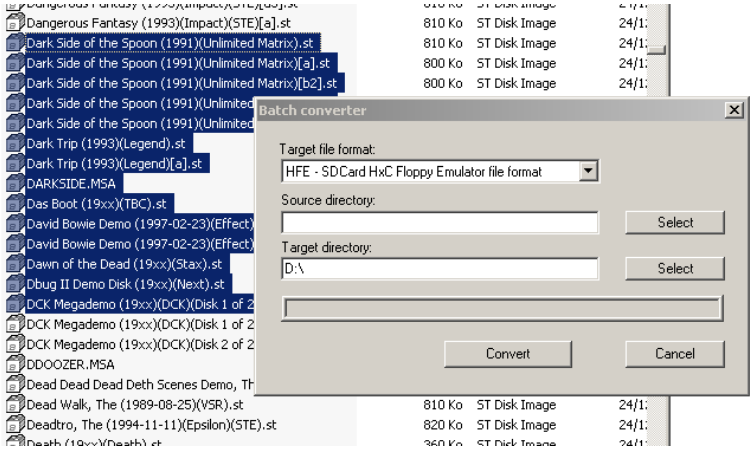


Figure 8 : Fenêtre de convertion en batch

Choissez le lecteur correspondant à votre lecteur carte SD (Ici D:) comme répertoire cible.

Dans le cas du SD HxC Floppy Emulator le format de fichier cible (Target file format) doit être HFE. Faite ensuite un glisser-lâcher sur la fenêtre des fichiers à convertir et à placer sur la carte SD.

Après cela la carte SD contient les fichiers images HFE. Vous pouvez ensuite utiliser la carte SD dans l'émulateur.

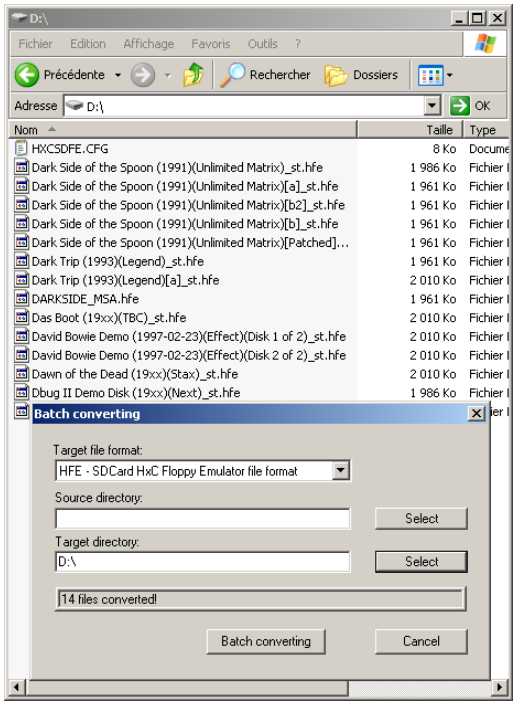


Figure 9 : Les fichiers images HFE sur la carte SD

Note 1 : Vous pouvez convertir de façon récursive une arborescence complète d'un répertoire en spécifiant le point de départ dans le champ "Source directory".

Note 2 : Un fichier HFE peut également être reconverti dans des formats d'image disques standards: ADF/IMG ou IMD. Pour cela il faut juste changer le format cible à votre convenance dans le champ « Target file format ».

3.4 Utilisation du SD HxC Floppy Emulator

Sans carte SD, l'émulateur attend l'insertion de cette dernière. Dans ce cas un certain nombre de messages (version hardware/firmware…) sont affichés sur l'écran :

Figure 10 : Première mise sous tension de l'émulateur

Après l'insertion de la carte SD, vous pouvez naviguer a travers le contenu de la carte SD avec les boutons ⊲ et ⊳ et utiliser le bouton ⇕ pour entrer dans les sous-répertoires ou charger une image disque.

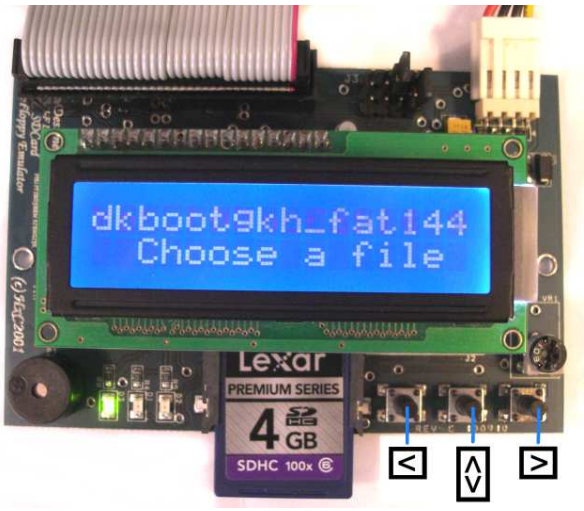


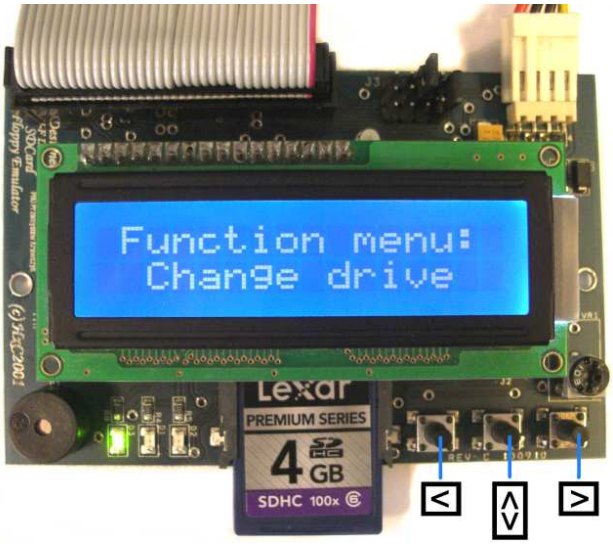
Figure 11 : Navigation dans la carte SD

Figure 12 : Chargement d'une image disque

L'image disque est chargée et est accessible à l'ordinateur hôte.

Pour éjecter une image disque appuyer brièvement sur ⇕.
Vous pouvez aussi directement changer d'image disque en appuyant sur les boutons ⇐ ou ⇒.

Si vous voulez revenir au menu de sélection du lecteur disquette, dans le but d'insérer une autre image disque dans un autre lecteur disquette virtuel, appuyez sur ⇕ jusqu'à ce que le menu apparaisse :



Sélectionnez la fonction « Change drive » pour changer de lecteur courant.

La protection en écriture de la disquette peut être activée en utilisant la protection en écriture de la carte SD.

Figure 13 : Protection en écriture de la carte SD

4 Le logiciel HxC Floppy Emulator

Le logiciel HxC Floppy Emulator vous permet de convertir/créer les fichiers images pour le SD HxC Floppy Emulator.

La liste des formats d'images supportés peut être trouvée en page 31 ou sur la page web du projet : http://hxc2001.free.fr/floppy_drive_emulator/

4.1 La fenêtre principale

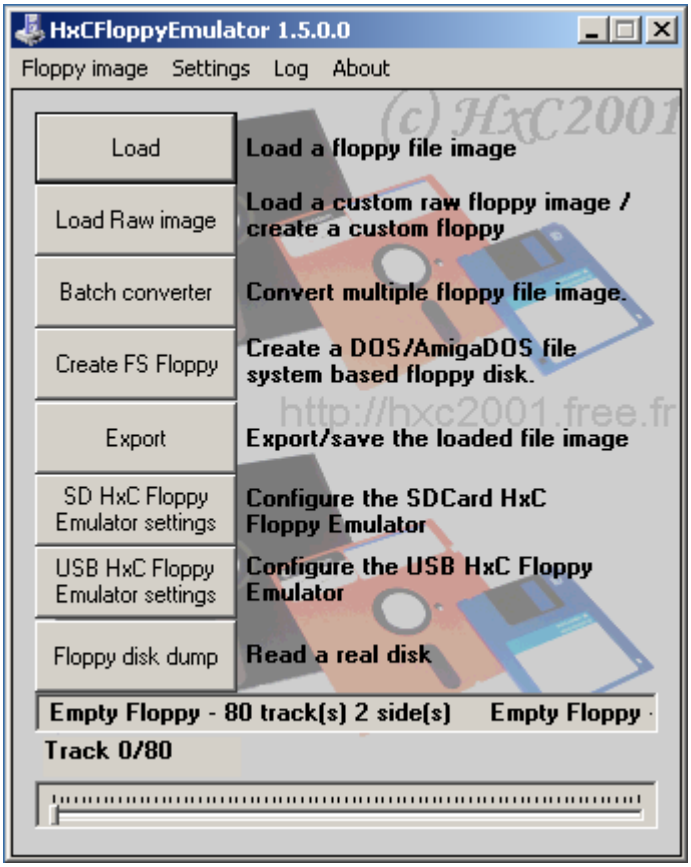


Figure 14 : Les fonctions principales du HxC Floppy Emulator

La fenêtre principale de l'application permet d'accéder aux fonctions suivantes :

► Load & Load Raw image	Charger une image disque.
► Batch converter	Conversion en batch d'une arborescence d'image disque.
► Create FS Floppy	Création d'une image disque type DOS ou Amiga DOS.
► Export	Exportation/conversion de l'image disque chargée.
► SD HxC Floppy Emulator settings	Configuration du SD HxC Floppy Emulator (éditeur du fichier HXCSDFE.CFG).
► USB HxC Floppy Emulator settings	Configuration de l'USB HxC Floppy Emulator.
►Floppy disk dump	Lecture d'une disquette réelle.

4.2 Configuration du SD HxC Floppy Emulator

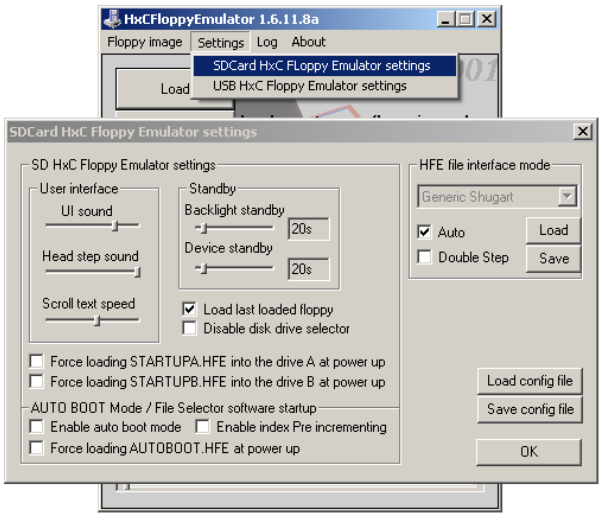


Figure 15 : Fenêtre de configuration du SD HxC Floppy Emulator

Cette fenêtre permet d'éditer ou de créer le ficher de configuration HXCSDFE.CFG :

►UI sound	Ce réglage permet de changer le niveau sonore des alertes sonores de l'émulateur.
►Head step sound	Ce réglage permet de changer le niveau sonore lors d'un changement de piste.
►Scroll text speed	Ce réglage permet de changer la vitesse de défilement sur l'écran.
►Backlight standby	Ce réglage permet de changer le temps avant la mise en veille du retro-éclairage de l'écran.
►Device standby	Ce réglage permet de changer le temps avant la mise en veille de l'émulateur.
►Load last loaded floppy	Si activé, la dernier image sélectionnée est utilisée à la mise sous tension.
►Force loading STARTUPA.HFE into the drive A/B at power up	Permet de forcer le charger l'image STARTUPA.HFE et/ou STARTUPB.HFE à la mise sous tension.
►Enable auto boot mode	Si activé, le fichier autoboot.hfe sera utilisé par défaut au démarrage.
►Force loading AUTOBOOT.HFE at power up	Le fichier autoboot.hfe sera toujours utilisé à la mise sous tension.
►Enable index Pre incrementing	Permet de passer au prochain slot à l'insertion de la carte SD (évite l'utilisation des boutons)
►HFE file interface mode	Le mode de l'interface de l'émulateur est configuré automatiquement dans les fichiers images HFE. Pour forcer/changer le mode de l'interface, avant toute conversion, désactivez "Auto" et choisissez le mode voulu.

4.3 Chargeur/générateur d'image disque spécifique

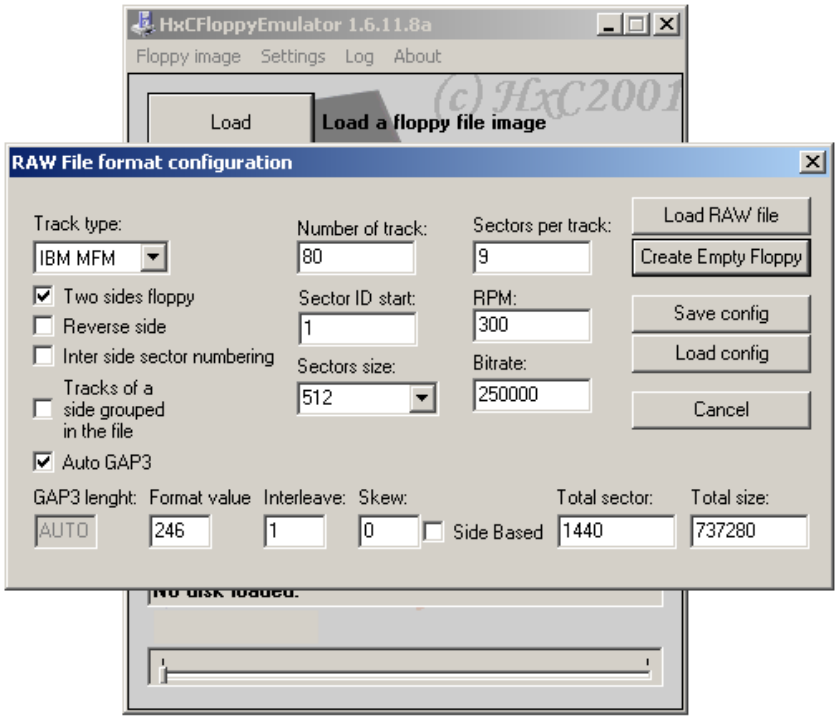


Figure 16 : La fenêtre de configuration du format

Cette fenêtre vous permet de créer un format de disque spécifique à vos besoins. Vous pouvez ensuite avec le format spécifié charger une image disque (bouton "Load RAW file") ou créer/formater une image avec le bouton "Create Empty Floppy"..

►Track type	Format de piste :IBM MFM(DD/HD) ou IBM FM (SD).
►Two sides floppy	Nombre de faces : Activé = 2 faces sinon 1 face.
►Reverse side	Inverse physiquement les 2 faces
►Track of a side grouped in the file	Si active, la première moitié du fichier sera en face 0, la seconde en face 1.
►Number of track	Nombre de pistes sur le disque : 80, 40…
►Sector per track	Nombre de secteurs par piste.
►Sector size	Taille en octets par secteur.
►Sector ID start	Numéro de secteur de départ: généralement 1
►GAP3 length	Taille des intersecteurs (gap3). Calculez automatiquement si le mode Auto est activé.
►Interleave	Entrelacement des secteurs.
►Skew	Décalage des pistes les unes par rapport aux autres.
►Bitrate	Vitesse (valeurs courantes : 250000 (DD), 300000 (5'1/4), 500000 (HD)…).
►RPM	Vitesse de rotation en tours par minute (valeurs courantes : 300, 360).

Les boutons "Load" et "Create" peuvent apparaître désactivés si vous avez spécifié un format incorrect. Les paramètres sur lesquels vous pouvez jouer pour corriger cela sont le GAP3, le RPM et le bitrate.

4.4 Lecture et conversion de disquette.

Cette fonctionnalité vous permet de lire une disquette afin d'en utiliser le contenu avec l'émulateur SD HxC Floppy Emulator. Cet outil est capable de lire la plupart des disquettes MFM (DD/HD) et FM (SD).

Pour pouvoir utiliser cette fonction vous devez être équipé d'un lecteur de disquette 8", 5"1/4, 3"1/2 ou 3" directement connecté sur la carte mère de l'ordinateur. Les lecteurs de disquette sur port USB ne sont pas supportés.

Cet outil utilise le driver fdrawcmd pour Windows développé par Simon Owen. Vous pouvez télécharger ce driver sur le site de Simon Owen : http://simonowen.com/fdrawcmd

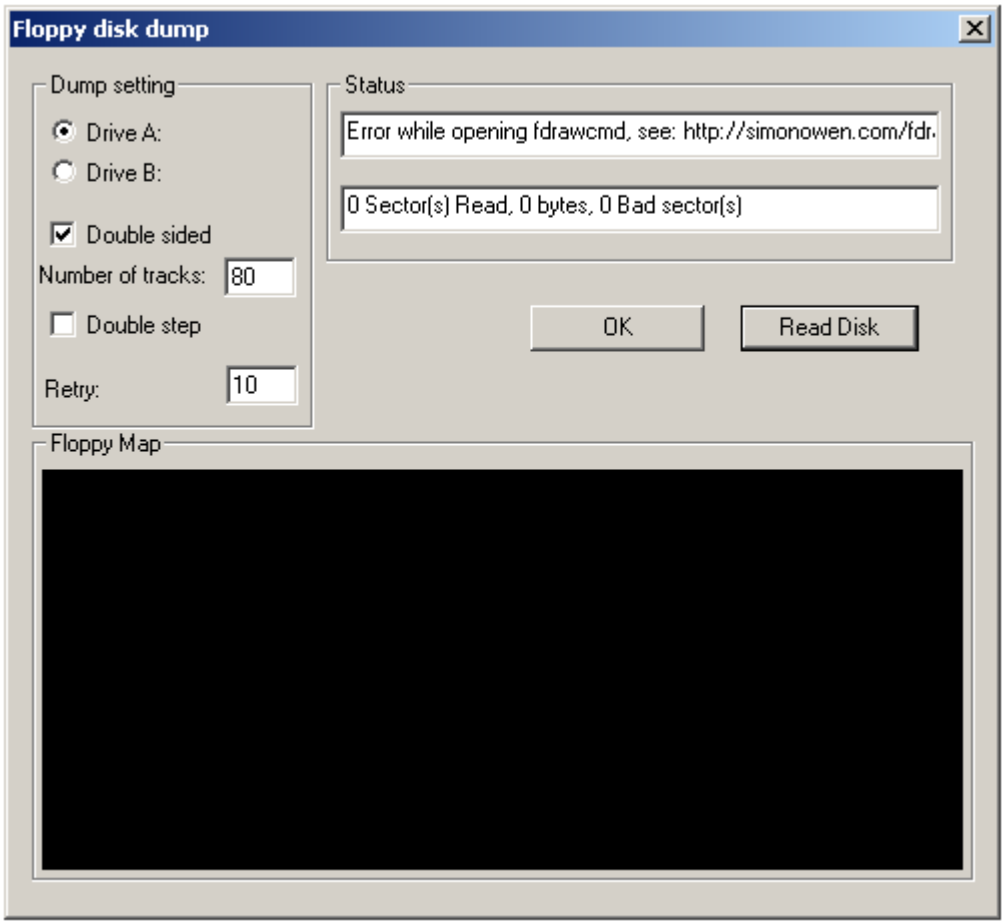


Figure 17 : La fenêtre de la fonction de lecture de disquettes.

La configuration à appliquer dépend de la disquette que vous voulez lire. Ci-dessous quelques exemples :

Lecteur de disquettes	Configuration
1.44MB/720KB 3”1/2	80 pistes et 2 faces.
1.2MB 5”1/4	80 pistes et 2 faces.
360KB 5”1/4	40 pistes et 2 faces.
8”	77 pistes et 2 faces.

Pendant la lecture, chaque piste est analysée et le format courant (type, bitrate, nombre de secteurs,…) est affiché dans les différents champs de la fenêtre.
Lorsque la lecture est terminée, l’image obtenue est chargée dans l’application. Vous pouvez alors l’exporter au format HFE.

Note : Le mode d’interface par défaut de l’image lue est <<Generic Shugart>>. Si le système utilise un autre mode d’interface (PC par exemple), ne pas oublier de sélectionner le mode d’interface désiré dans la fenêtre de configuration SD HxC Floppy Emulator settings (Plus de détail en page 20) avant d’exporter l’image.

Attention : Attention au nombre de piste configuré pour la lecture ! Une valeur trop importante peut endommager le lecteur.

Note : Si vous voulez lire une disquette 5”1/4 360KB dans un lecteur 5”1/4 1.2MB, il faut activer le mode “double step” et fixer le nombre de piste à 40.

4.5 Générateur de disquette avec un système de fichier

Le logiciel HxC Floppy Emulator est capable de générer une image disquette de type MS DOS ou AmigaDos. Grâce à cette possibilité vous pouvez générer une disquette virtuelle contenant vos fichiers.

Pour générer une disquette de type DOS/FAT12, cliquez sur le bouton “Create FS Floppy” et choisissez le format et la capacité désirée (Exemple : 3”5 1.44MB MSDOS).

Ensuite cliquez sur le bouton “Inject director” et sélectionnez le répertoire contenant les fichiers et répertoires à ajouter sur la disquette.

Lorsque l’opération est terminée, vous pouvez exporter l’image créée au format HFE et la copier sur la carte SD.

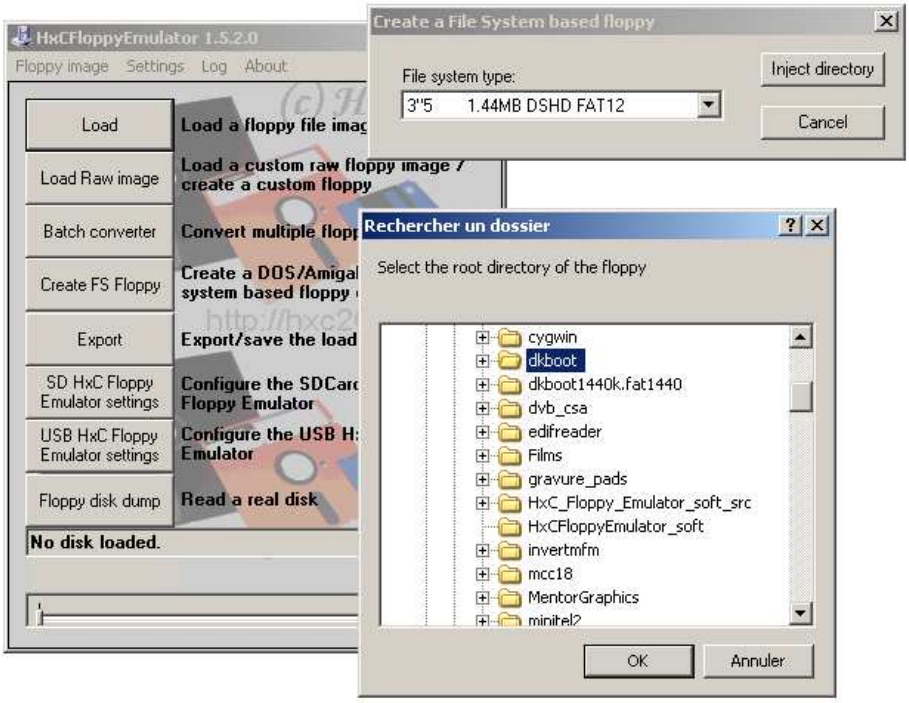


Figure 18 : Création du disquette virtuelle

Note : En ajoutant une extension particulière au répertoire racine, vous pouvez générer l’image par un simple drag & drop du répertoire sur l’application HxC Floppy Emulator.
Par exemple si vous faite un drag & drop du répertoire “myfloppydisk.fat1440”, une disquette MS DOS de 1.44MB est créée.

5 Logiciel de sélection d'image

Le logiciel de sélection d'image pour le SD HxC Floppy Emulator est un outil fonctionnant actuellement sur les gammes Atari ST, Amiga et Amstrad CPC. Ce programme permet de sélectionner les images à charger directement sur la machine cible. Dans ce cas de figure l'écran LCD du HxC est optionnel .

Pour utiliser cet outil, copiez le fichier AUTOBOOT.HFE à la racine de la carte SD et activez la fonction "Enable auto boot mode" (voir page 20 pour plus de détails).
La dernière version de ce logiciel peut être téléchargé sur la page projet :
http://hxc2001.free.fr/floppy_drive_emulator/index.html#download

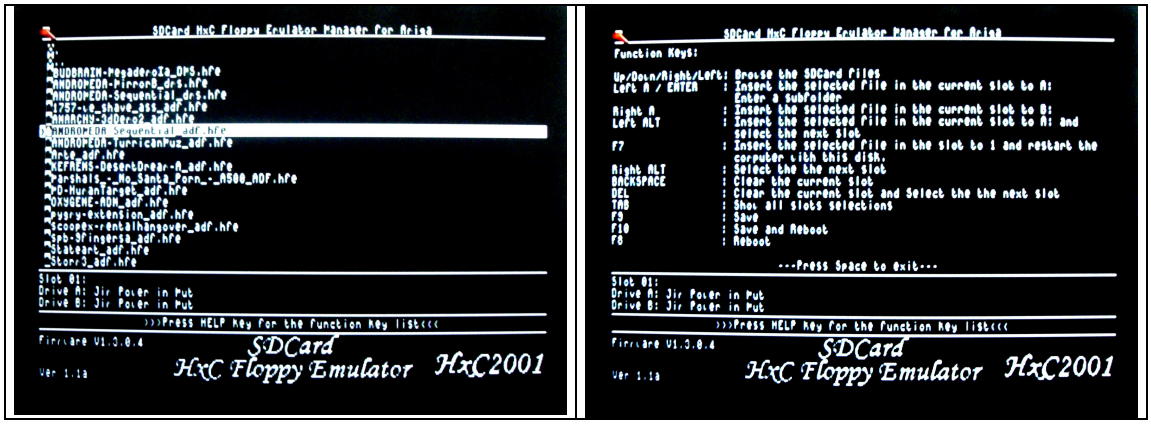


Figure 19 : Page principale et page d'aide du sélecteur d'image (version Amiga)

Lorsque le programme a démarré, vous pouvez naviguer à travers le contenu de la carte SD. Une page d'aide est disponible en appuyant sur le bouton "HELP".

Vous pouvez sélectionner une image ou un ensemble d'image (dans la "slot list") sur 1 ou 2 lecteurs virtuels.

Après redémarrage (F7 ou F10), les boutons de l'émulateur permettent ces actions :

Bouton ⊴ : Slot précédent.
Bouton ⊵ : Slot suivant.
Bouton ⍒ : Sélectionner le premier slot (AUTOBOOT.HFE)

A chaque changement d'image, le numéro du slot courant est indiqué par le buzzer et la LED d'accès.

Note : Si vous appuyez plus d'une seconde sur les boutons ⊴ ou ⊵, le premier slot est alors sélectionné. Cela permet l'utilisation d'un bouton unique.

6 Mise à jour du firmware.

Ci-dessous la procédure de mise à jour du firmware du SD HxC Floppy Emulator.

► Téléchargez la dernière version du firmware :
http://hxc2001.free.fr/floppy_drive_emulator/SDCard_HxCFloppyEmulator_firmware.zip

► Copiez le nouveau fichier firmware (*.upd) sur une carte SD fraîchement formatée en FAT32.
► Insérez la carte SD dans l'émulateur.
► Appuyez sur les boutons de droite et de gauche en même temps, mettez ensuite la carte sous tension et continuez à appuyer sur les boutons pendant 2 secondes après l'allumage.
► Attendez quelques secondes… C'est fait ! La carte doit redémarrer automatiquement.

Note 1 :

Le fichier ne doit pas être fragmenté sur la carte SD et doit être dans les premiers fichiers dans le répertoire racine.

Pour ces raisons il est recommandé d'utiliser une carte SD fraîchement formatée en FAT32. Dans le cas contraire un code d'erreur 4 ou 6 pourrait apparaître. (voir note 2).

Note 2 :

Code d'erreur LED du Bootstrap :
Error 1 : (cycles de 1 clignotement et 2 secondes de pause) No software flashed.
Error 2 : (cycles de 2 clignotements et 2 secondes de pause) SDCard init error.
Error 3 : (cycles de 3 clignotements et 2 secondes de pause) FAT error.
Error 4 : (cycles de 4 clignotements et 2 secondes de pause) UPD File not found!
Error 5 : (cycles de 5 clignotements et 2 secondes de pause) Bad UPD File header! (bad file)
Error 6 : (cycles de 6 clignotements et 2 secondes de pause) Bad data CRC! (file corrupted)
Error 7 : (cycles de 7 clignotements et 2 secondes de pause) Bad data size!
Error 8 : (cycles de 8 clignotements et 2 secondes de pause) Write error (Pic flash error)

7 Spécifications techniques

7.1 Interface lecteur de disquette

- Connecteur lecteur de disquette HE10 34 broches
- Mode compatible Shugart.
- Mode compatible PC.
- Sortance jusqu'à 24mA.
- Emulation de 2 lecteurs de disquettes
- 300 RPM , 360 RPM supporté (autres RPM possible).
- Jusqu'à 255 pistes par image.
- 1 ou 2 faces supportées

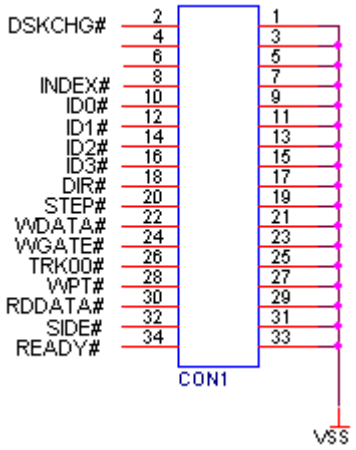


Figure 20 : Connecteur interface lecteur de disquette.

7.2 Alimentation

- Entrée alimentation standard 5V +/- 10%
- Consommation : 500mA max en pic (veille :100mA, Lecture/Ecriture:170mA min – 450mA max. variable selon la carte SD)

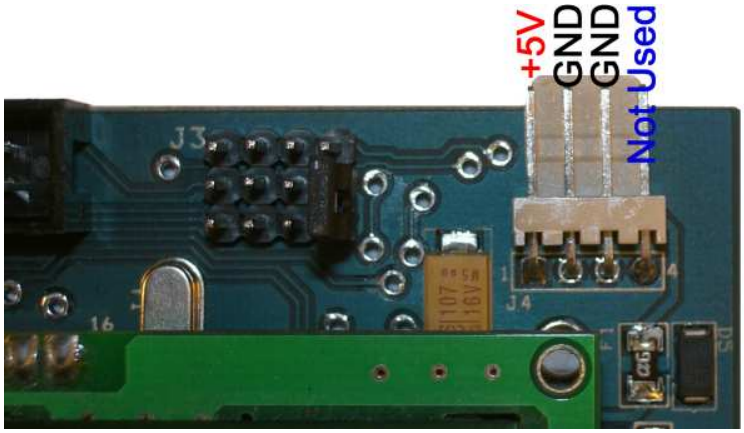


Figure 21 : Brochage du connecteur d'alimentation

7.3 Interface utilisateur

- 3 voyants:
  - Voyant d'alimentation
  - Voyant d'accès disquette.
  - Voyant d'accès carte SD.
- 3 boutons ("Précédent","Sélectionner/Ejecter","Suivant").
- 1 buzzer (Déplacement de tête et son interface utilisateur).
- 1 écran LCD détachable 2*16 caractères alphanumérique.

(**Note** : Le LCD et les buttons peuvent être déportés grâce au connecteur ci-dessous).

- Logiciel de sélection d'image disponible pour Amiga, Atari ST et Amstrad CPC.

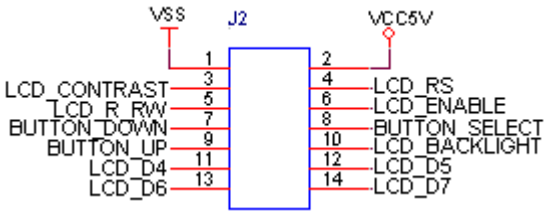


Figure 22 : Brochage du Connecteur pour LCD/boutons déportés

7.4 Support cartes SD

- Cartes SD jusqu'à 2Go.
- Cartes SDHC jusqu'à 32Go.
  (Mode SPI à 10Mhz.)

7.5 Système de fichier supporté

- FAT32 supportée. Sous répertoires et fichiers à nom long supportés.

7.6 Emulation lecteur de disquette

Emulateur de disquettes en mode piste (piste complète pré encodée dans les fichiers HFE)

- Support en mode lecture:
  - La plupart des formats existant supportés (FM/MFM/Amiga track...).
  - Pistes spéciales supportées.
- Support en écriture :
  - Secteurs MFM (DD) 256 Octets
  - Secteurs MFM (DD) 512 Octets
  - Secteurs MFM (DD) 1024 Octets
  - Secteurs FM (SD) 128 Octets
  - Secteurs FM (SD) 256 Octets
  - Secteurs FM (SD) 512 Octets
  - Secteurs FM (SD) 1024 Octets
  - Ecritures pistes Amiga (depuis la version PCB révision C)
  - Ecritures pistes E-mu (depuis la version PCB révision C)

7.7 Densité supportées

- 250/300Kbits/s (Disquettes SD/DD)
- 500Kbits/s (Disquettes HD)
  (Autres densité possible)

Note : Le bit rate variable sur une même piste n'est pour l'instant pas supporté. Par conséquence certaine protection contre la copie provenant de certains formats d'images (IPF et STX) ne sont pas complètement émulées ! Si vous cherchez un émulateur supportant à 100% les IPF / STX, le USB HxC Floppy Emulator répond peut être à vos besoins.

7.8 Fonctionnalités supplémentaires

- Mise à jour du firmware par la carte SD.
- Chargement automatique de la dernière image chargée à la mise sous tension.
- Chargement d'une image prédéfinie à la mise sous tension.
- Prêt des la mise sous tension ! / Pas de temps de chargement !
- Mode Accès d'accès direct à la Carte SD : Mode passerelle : Floppy2SD bridge.

7.9 Mécanique / dimension

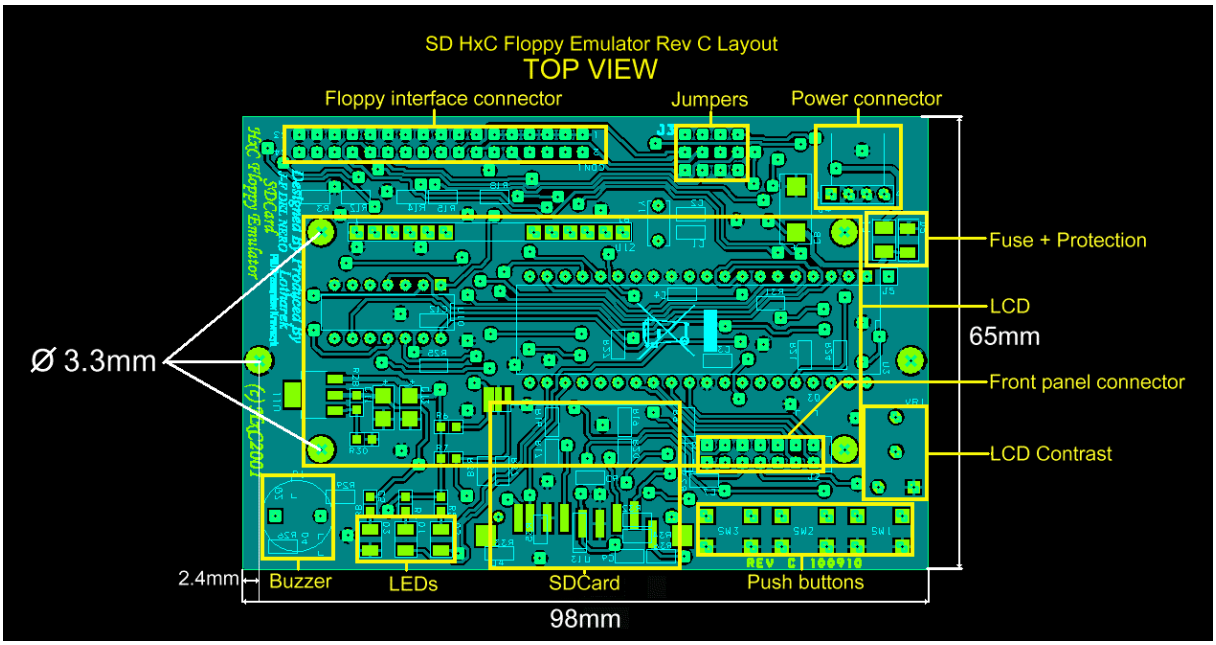


Figure 23 : Mécanique / dimension

7.10 Formats de fichier supportés

Format de fichier	Cibles	Notes
*.ADF	Amiga computers	
*.ADF	Acorn computers	
*.ADZ	Amiga computers	
*.AFI	Multiplatform	HxC Floppy Emulator file format
*.DSK (CopyQM)	Multiplatform	
*.DSK (CPC DSK)	Amstrad CPC computers	
*.DSK (MSX DSK)	MSX computers	
*.DSK (Oric DSK)	Oric computers	MicroDisc or compatible FDC needed
*.DSK (PC99 DSK)	TI99/4A computers	
*.DSK (V9T9 DSK)	TI99/4A computers	
*.D81	Commodore C64+1581	
*.D88	NEC PC88/PC98	
*.DIM	Atari ST computers	
*.DMK	TRS-80	
*.DMS	Amiga computers	
*.DPX	Oberheim DPX	
*.EDE	Ensoniq EPS/ SQ-80/VFX-SD	
*.EM1	Emax	
*.EM2	Emax II	
*.EMX	Emax I/II	Operating system image
*.EMUFD	E-mu emulator	
*.EMUIIFD	E-mu emulator II	
*.EII	E-mu emulator II	
*.SP1200FD	E-mu SP1200	
*.EDM	Ensoniq Mirage	
*.FD	Thomson TO8D	
*.HDM	X68000	
*.HFE	Multiplatform	SD HxC Floppy Emulator file format
*.IMD	Multiplatform	
.IMG/.IMZ/*.IMA	PC / Multiplatform	
*.IMG	Prophet 2000/2002	
*.IPF	Multiplatform	Need CAPSImg.dll
*.JV1	TRS-80	
*.JV3	TRS-80	
*.JVC	TRS-80 CoCo	
*.MFM	Multiplatform	HxC Floppy Emulator file format
*.MGT	Sam Coupé	
*.SAD	Sam Coupé	
*.MSA	Atari ST computers	
*.SAP	Thomson TO8D	

*.SCL	ZX Spectrum	
*.SMC	SNES / Super Famicom	Generate a FAT12 floppy
*.ST	Atari ST computers	
*.STT	Atari ST computers	STEem file format
*.STX	Atari ST computers	Pasti file format
*.TD0	Multiplatform	Teledisk file format
*.TRD	ZX Spectrum	
*.VDK	Dragon 64	
FAT12 file system generator	Multiplatform: PC – Keyboards/Samplers – CNC machines.	More details on the page 24
RAW floppy loader/generator.	Multiplatform. Allow you to generate a custom floppy format	More details on the page 21
Floppy reader	Multiplatform. Allow you to read a real floppy disk.	More details on the page 22

Note : Ce liste est sujet à modifications car de nouveaux support de formats sont régulièrement ajoutés.
Si vous avez besoin du support d'un format non listé, n'hésitez pas a nous contacter (contacts page 34).

7.11 Liste des machines compatibles

La liste des machines/ordinateurs/synthétiseurs compatibles et testés avec le SD HxC Floppy Emulator est tenue a jour et visible à cette adresse :

http://hxc2001.free.fr/floppy_drive_emulator/support.htm

7.12 Contact / page projet

Les logiciels sont régulièrement mis à jour pour de nouvelles fonctionnalités et/ou corrections.
Les logiciels sont disponibles sur le site du projet :

http://hxc2001.com/

Pour remonter un problème ou un bug il existe un forum dédié au support:

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

ou contactez nous par email:

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11 Rue Frédéric Magisson
75015 PARIS
France
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Email : hxc2001@hxc2001.com
Website : http://hxc2001.com/

Ce produit est fabriqué est vendu par Lotharek:

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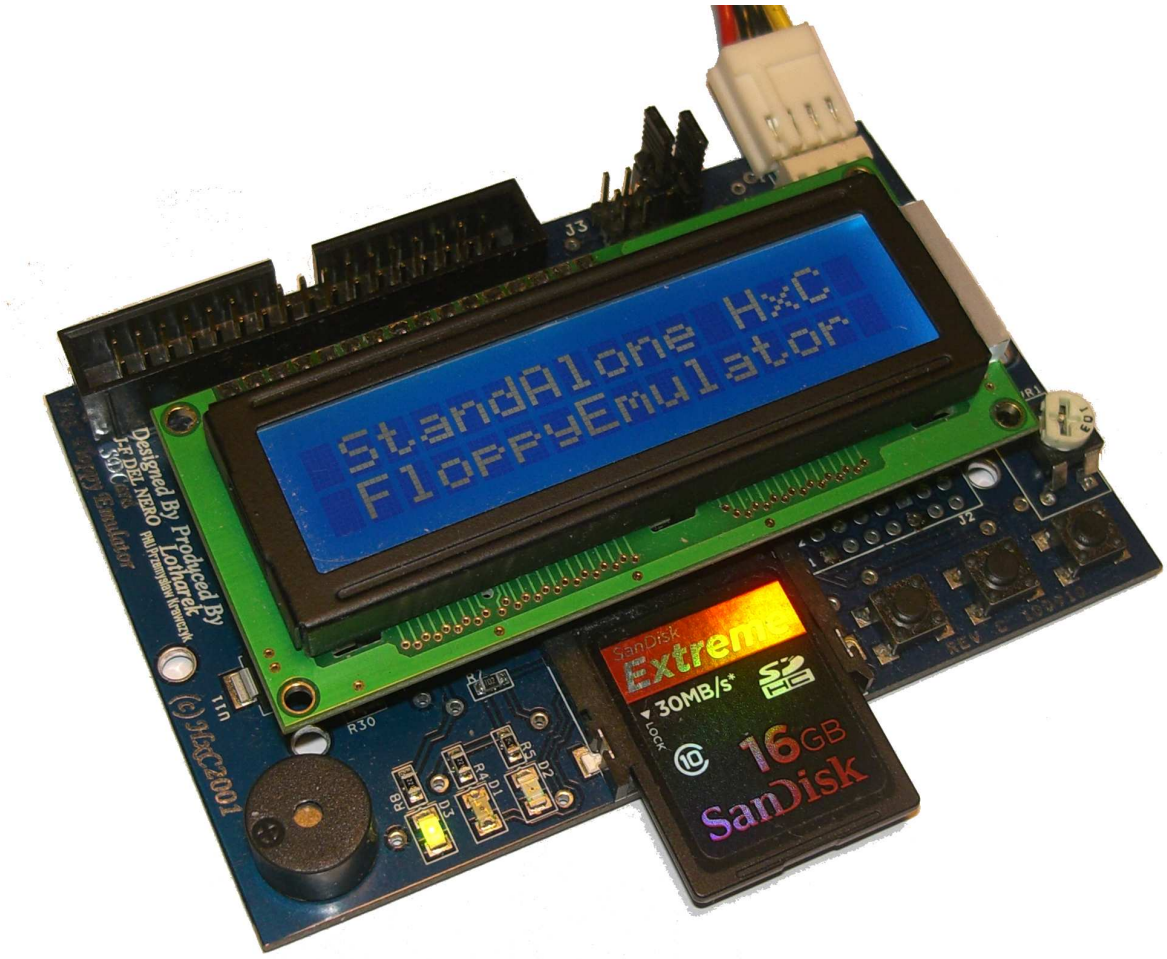
Website : http://www.lotharek.pl/

SDCard HxC Floppy Emulator User Guide issued January 2011.

SDCard HxC Floppy Emulator

User Manual



http://hxc2001.com/

SDCard HxC Floppy Emulator User Guide Disclaimer

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SDCard HxC Floppy Emulator User Guide issued August 2011.

Summary:

Figure Summary:

1 General description / requirement

The SDCard HxC Floppy Emulator is an universal floppy drive emulator based on SD/SDHC memory card.

To use it you need :

- A computer/device/sampler/keyboard with a Shugart or PC compatible floppy disk drive interface.
- An SD or SDHC memory card (from 64MB up to 32GB).
- A PC to pre-process/prepare floppy file images and copy them on the SDCard.

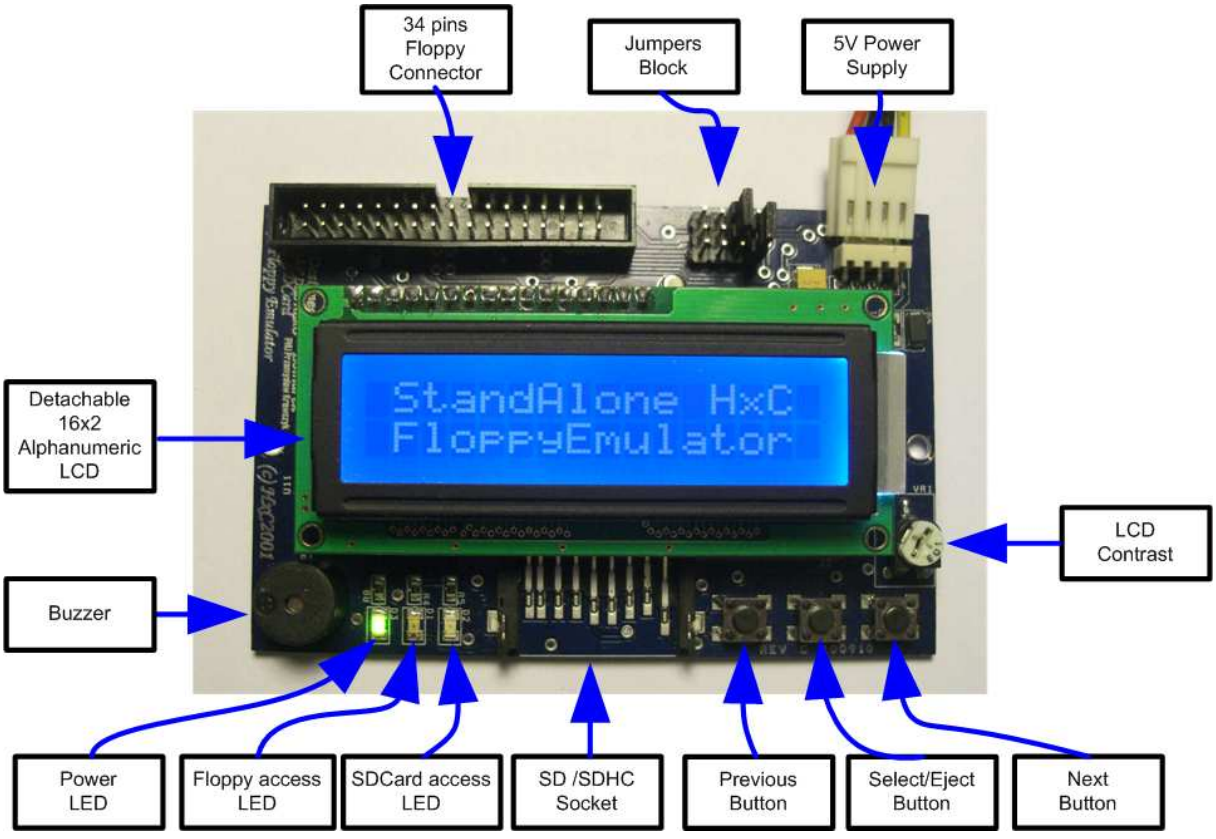


Figure 1 : The SDCard HxC Floppy Emulator

2 Hardware requirement / 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 500mA for proper operations (200mA 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.

Below the power connector pinout:

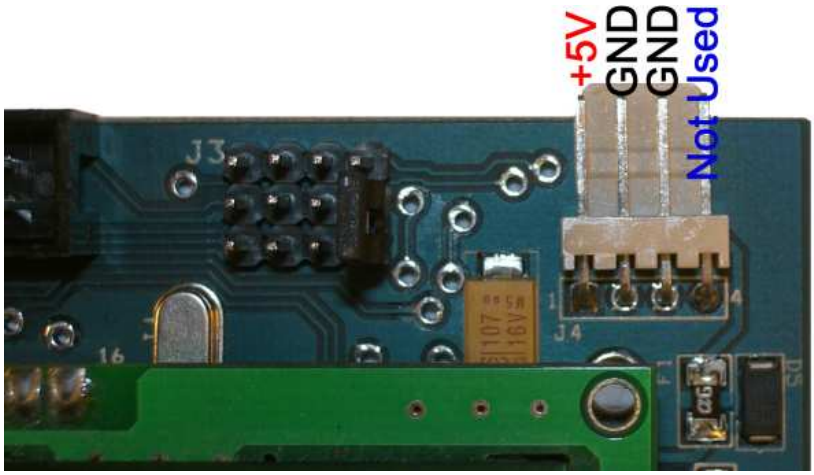


Figure 2 : Power supply connector pinout

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

Amstrad CPC6128 users : The CPC6128 floppy connector has a reverse 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 since the CPC6128 doesn't need it.

2.2 Floppy interface connection

A 34 pin floppy cable must be used to connect the device to the host computer. This one can be twisted or non-twisted.

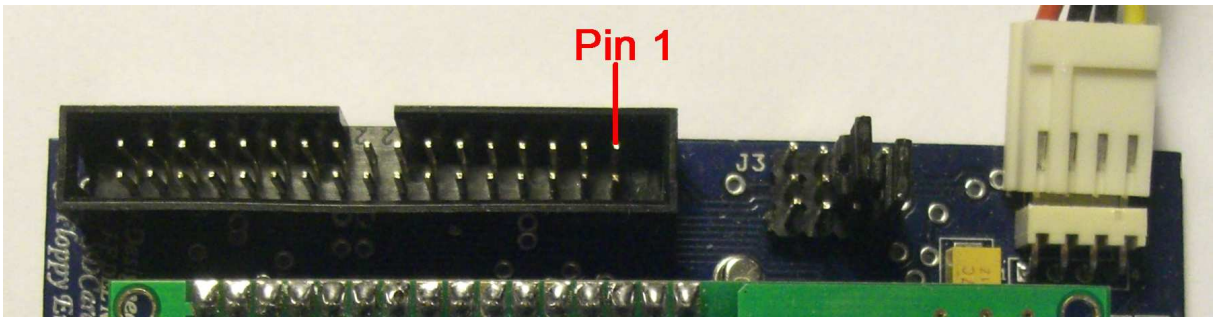


Figure 3 : Floppy connector

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 case (Amiga,...), the original floppy cable is reversed : 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. If your are using a twisted cable, the red wire MUST be to the right (pin 1).

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 is still always on, this probably means that the floppy cable is connected in the wrong way. (Drive select lines forced/connected to the ground).

2.3 Jumper settings

Here is the jumper configuration settings:

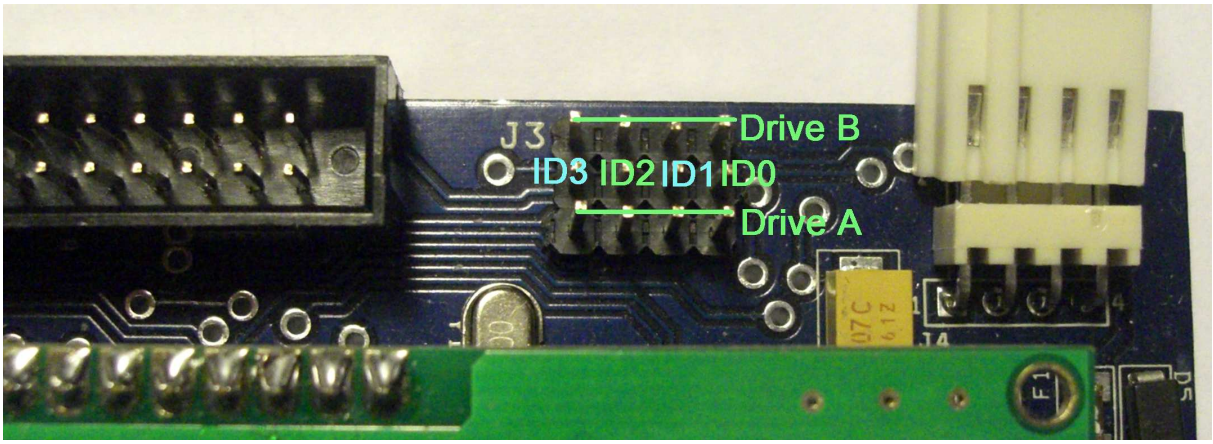


Figure 4 : Jumpers settings

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 SDCard 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 the floppy cable used (twisted or not), the meaning of IDx/jumper lines may change. Below you can see some examples of jumpers settings.

2.3.1 Atari ST / Amiga / Shugart jumper settings

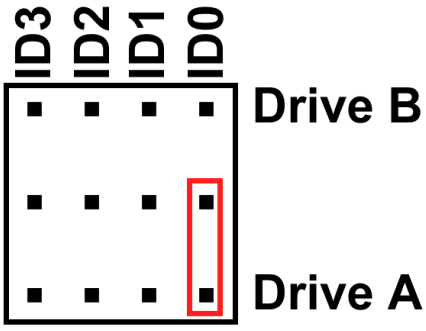
ID line	ID3	ID2	ID1	ID0
Host Line	MTRON	DS2	DS1	DS0
Function	Motor On	DF2	B: / DF1	A: / DF0

Table 1 : Shugart jumper setting

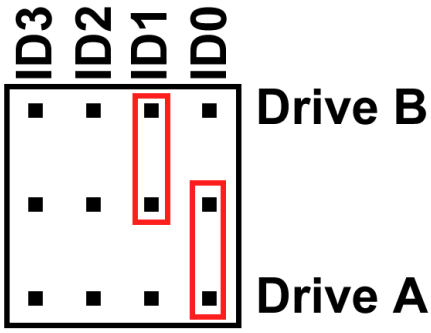
Note : If your are using a twisted floppy cable, the ID lines are inverted. In this case IDs lines meaning are changed:

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

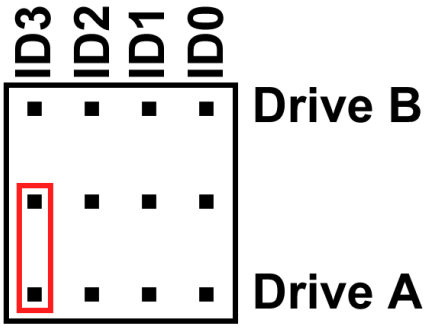
Table 2 : Shugart jumper setting (twisted floppy cable)



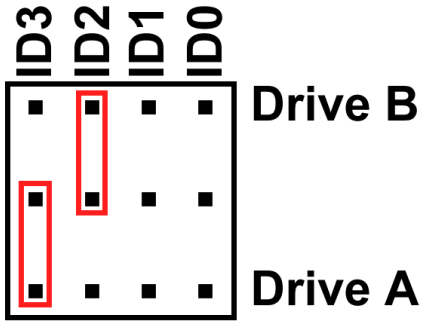
Emulator as the first disk drive
(A: / DF0)



Emulator as the first and second disk drive
(A: / DF0, B: / DF1)



Emulator as the first disk drive
(A: / DF0)
with a twisted floppy cable!



Emulator as the first and second disk drive
(A: / DF0, B: / DF1)
with a twisted floppy cable!

2.3.2 PC Compatible jumper settings

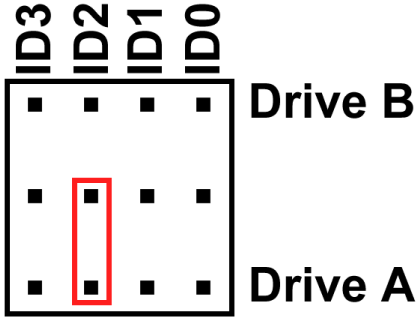
ID line	ID3	ID2	ID1	ID0
Host Line	/MOTEB	/DRVSA	/DRVSB	/MOTEA
Function	Motor Enable B	Drive Sel A:	Drive Sel B:	Motor Enable A

Table 3 : PC jumper setting

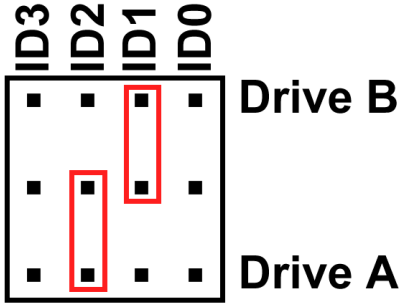
Note : If your are using a twisted floppy cable, the ID lines are inverted. In this case IDs lines meaning are changed:

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

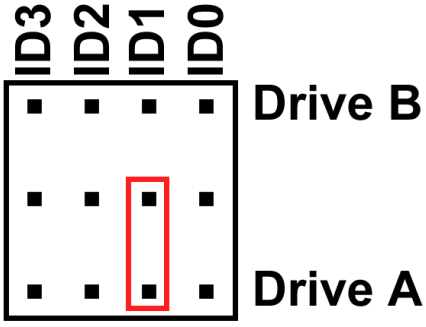
Table 4 : PC jumper setting (twisted floppy cable)



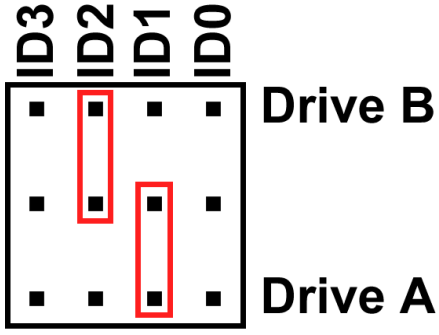
Emulator as the first disk drive (A:)



Emulator as the first and second disk drive (A:, B:)



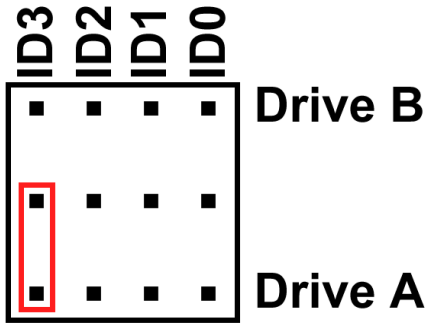
Emulator as the first disk drive (A:)
with a twisted floppy cable!



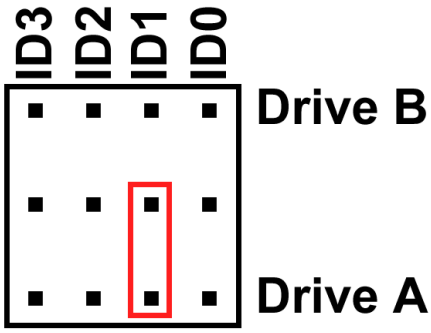
Emulator as the first and second disk drive (A: / DF0, B: / DF1)
with a twisted floppy cable!

2.3.3 Amstrad CPC6128 jumper settings

Below the possible jumper settings for Amstrad CPC 6128 (external port connection).

<table>
<tr>
<td> 

Emulator as the first disk drive

Note : In this case the internal floppy disk drive must be disabled.
To do this you can connect wire 23 of the external floppy cable to the ground (wire 24), or simply unplug the floppy cable from the internal disk drive.</td>
<td> 

Emulator as the second disk drive

(type |b to select the floppy emulator, and |a to select the internal disk drive)</td>
</tr>
</table>

3 Quick step by step guide

To use the SDCard HxC Floppy Emulator, follow this guide :

3.1 SDCard HxC Floppy Emulator installation

Remove the original floppy disk drive from the host computer, and replace it by the SDCard HxC Floppy Emulator.
Please read the "Hardware requirement/setup" section (Page 6) for more details.

3.2 Preparing the SDCard

► Format the SDCard in FAT32

To use the SDCard with the SDCard HxC Floppy Emulator this one must be formatted in **FAT32.** Others file system are currently not supported.

So the first thing to do is format the SDCard in FAT32:

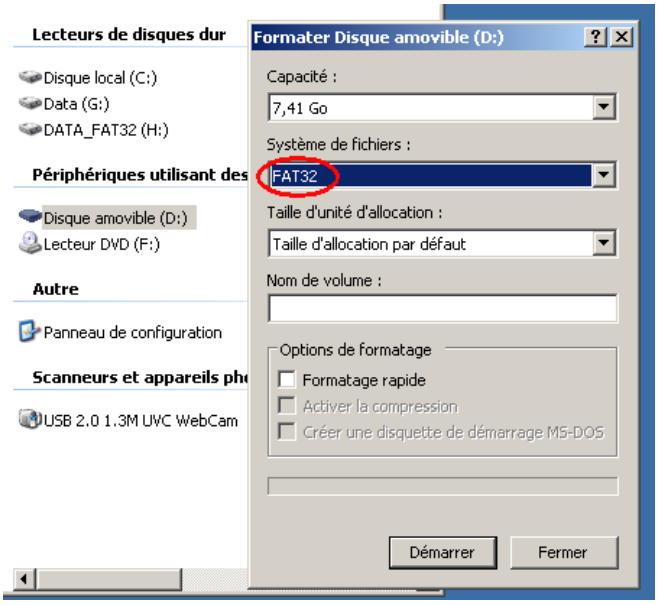


Figure 5 : Format the SDCard in FAT32

►Copy the file HXCSDFE.CFG into the SDCard

The SDCard HxC Floppy Emulator need the HXCSDFE.CFG be present on the SDCard. This file contains the floppy emulator settings and the path of last floppy file used/selected.

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

For more informations about the SDCard HxC Floppy Emulator settings please go to the SDCard HxC Floppy Emulator settings window chapter (page 19).

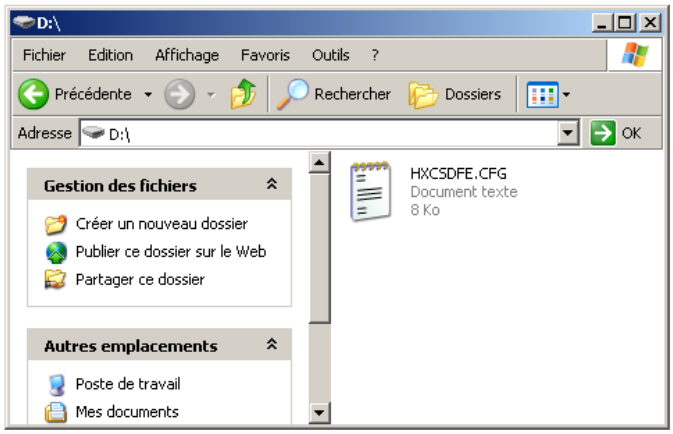


Figure 6 : Copy HXCSDFE.CFG to the SDCard

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

NOTE: If you want to use the floppy image file selector, copy the AUTOBOOT.HFE file after the HXCSDFE.CFG file.
For more details please go to the SDCard HxC Floppy Emulator file selector section (page 23).

3.3 Convert/Copy floppy images to the SDCard

The HxC Floppy Emulator software allows you to create, convert and manage floppy disk images files for the SDCard HxC Floppy Emulator.
This software can be started by double-clicking on the HxCFloppyEmulator.exe executable.

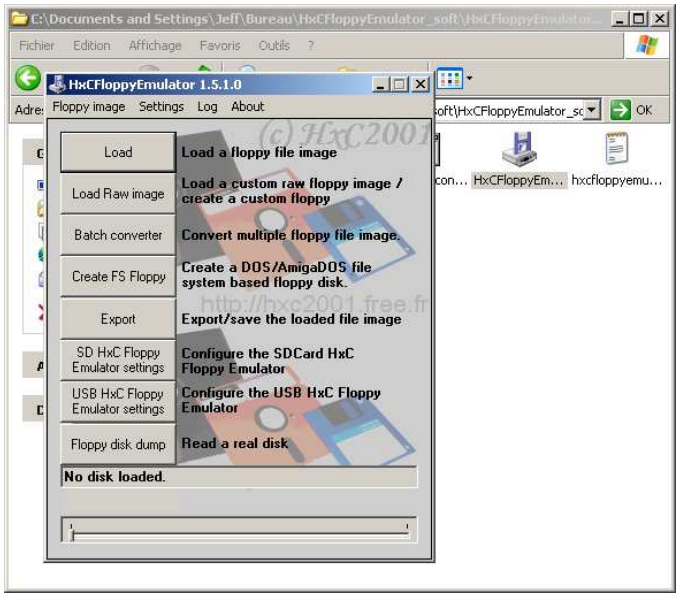


Figure 7 : Start HxC Floppy Emulator software

► Use the “Batch converter” function

To convert a large quantities of floppy images, the batch converter can be used. To do this, click on the <<Batch converter>> button. The following window should appears:

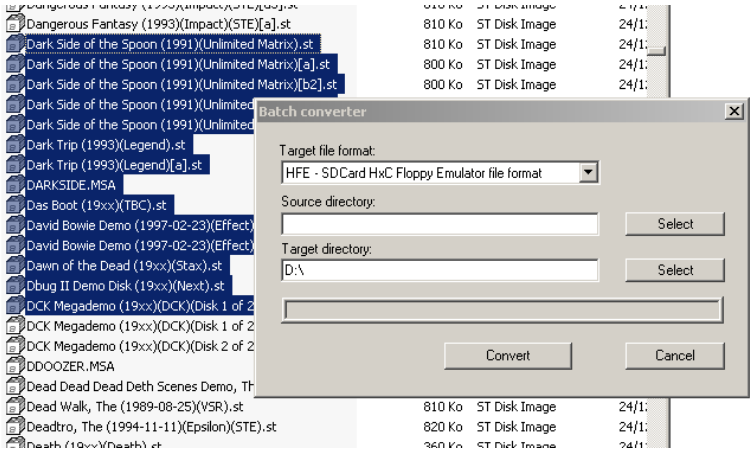


Figure 8 : The batch converter window

Choose the SDCard disk drive (D: here) as target directory.
For the SDCard HxC Floppy Emulator the target file format must be set to HFE.
Drag and drop on the window all floppy images you want to convert and copy in the SDCard.

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

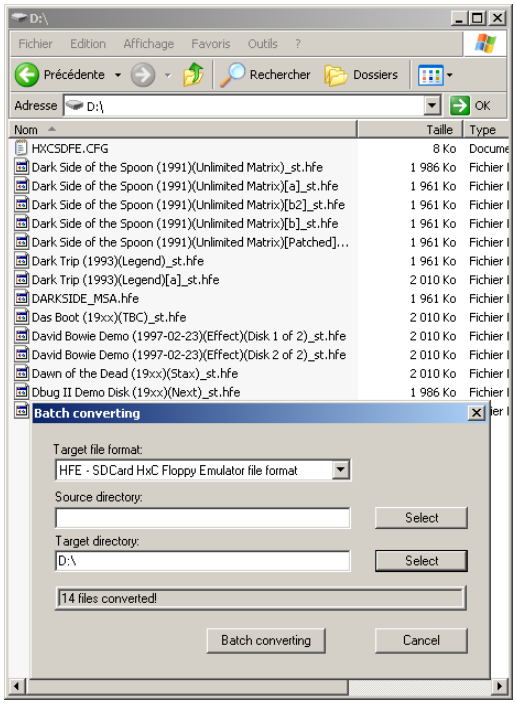


Figure 9 : HFE files after conversion

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

Note 2: A HFE file can be converted back to a standard floppy image : ADF/IMG or IMD. You just need to change the Target file format field.

3.4 Use the SDCard with the SDCard 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 ^v to confirm.

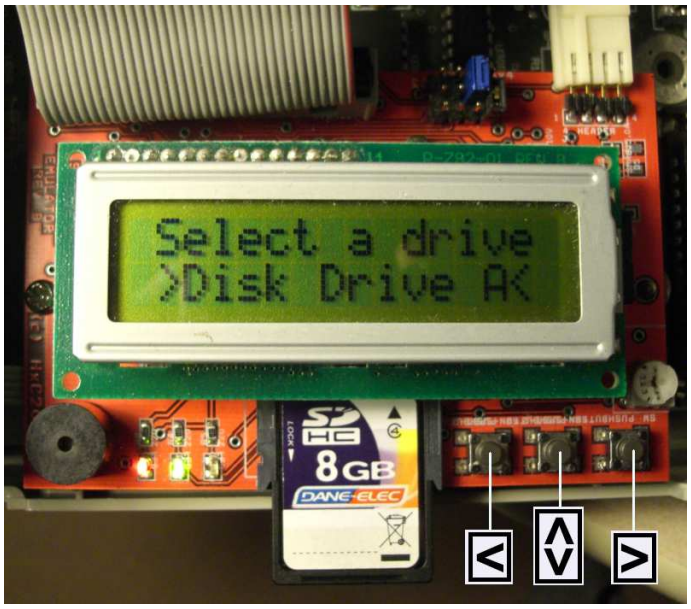


Figure 10 : Disk drive menu selector

Note: The drive menu selection can be disabled if you don't intend to use the two-drive emulation feature. More details in SDCard HxC Floppy Emulator settings window (page 19).

You can now browse the SDCard with < and > buttons and ^v to enter a subfolder or load a floppy image disk.

Figure 11 : Browsing the SDCard

Figure 12 : 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 to 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 13 : SDCard write protect switch

4 HxC Floppy Emulator software

The HxC Floppy Emulator software allows you to convert or create floppy image files for the SDCard HxC Floppy Emulator.

The list of supported file image format can be found in Supported file format / Input (page 28) or on the SDCard HxC Floppy Emulator project page :
http://hxc2001.free.fr/floppy_drive_emulator/

4.1 The main window

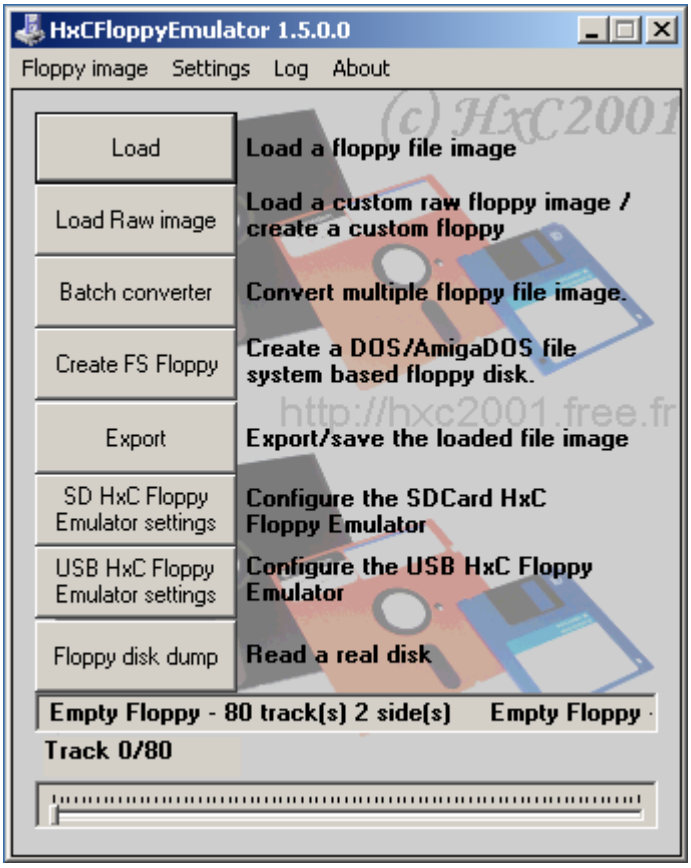


Figure 14 : HxC Floppy Emulator software functions

This window allows you to :

► Load & Load Raw image:	Load a floppy image.
► Batch converter:	Convert automatically a folder of floppy image.
► Create FS Floppy:	Create a MS DOS or Amiga DOS floppy disk.
► Export:	Export/convert the loaded floppy image.
► SD HxC Floppy Emulator settings:	Edit/create the HXCSDFE.CFG file.
► USB HxC Floppy Emulator settings:	Change the USB HxC Floppy Emulator settings.
►Floppy disk dump:	Dump a floppy disk and load it.

4.2 SDCard HxC Floppy Emulator settings window

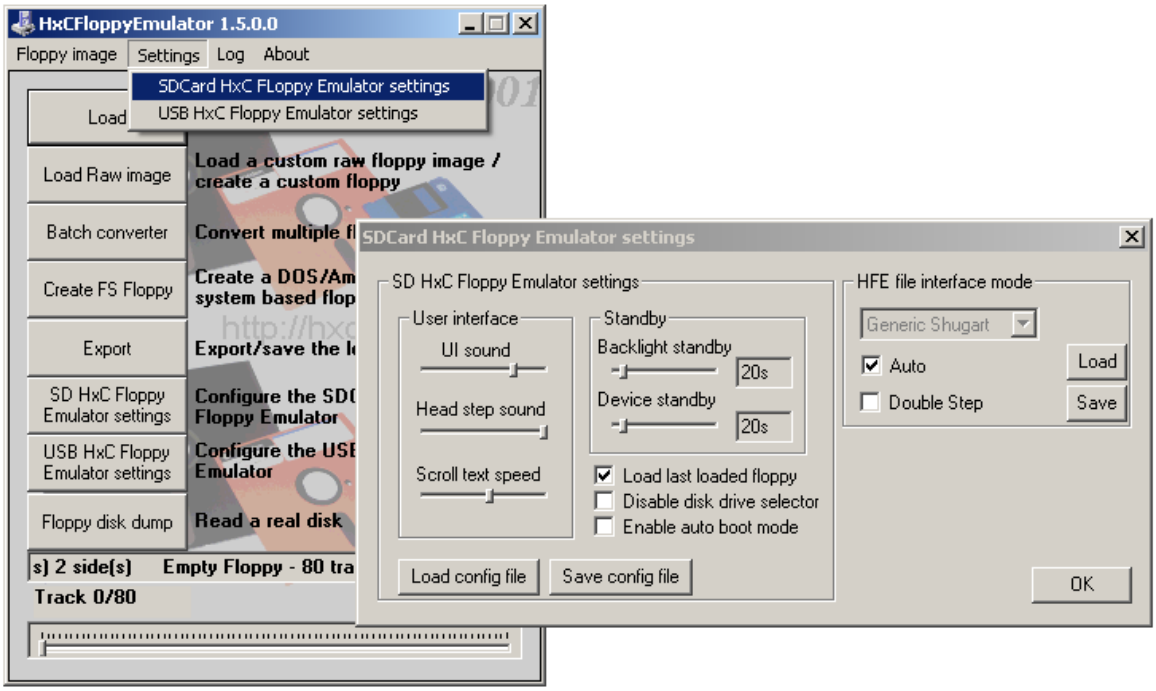


Figure 15 : SDCard HxC FLoppy Emulator settings window

This window allows you to create/edit the HXCSDFE.CFG file to change the behavior of the emulator :

►UI sound : This slide can be used to change the user interface sound level of the emulator.

►Head step sound : This slide can be used to change the head step sound level of the emulator.

►Backlight standby : This slide can be used to change LCD backlight power off timing.

►Device standby : This slide can be used to change standby timing.

►Load last loaded floppy : If checked, the last selected floppy image are auto-loaded at power up.

►Disable disk drive selector : If checked, the drive selection is disabled.

►Enable auto boot mode : If checked, the autoboot.hfe file is loaded at power up. If you intend to use a floppy image software selector, this feature must be set.

►HFE file interface mode : The floppy interface mode are automatically set into the SDCard HxC Floppy Emulator file image (HFE). To force/change the floppy disk interface mode, before converting files, uncheck "Auto" and choose the wanted floppy interface mode.

4.3 Custom raw file image loader / floppy generator

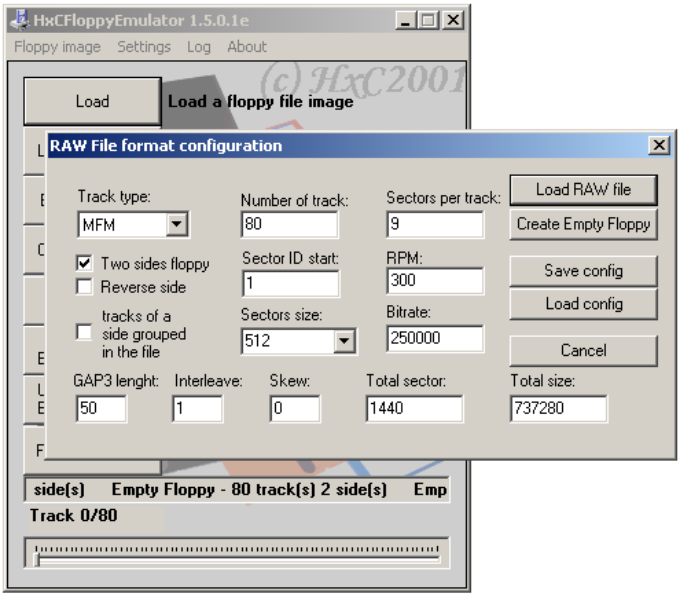


Figure 16 : RAW File loader window

This window allows you to specify a custom floppy disk format and load a raw file using your setting. You can also generate/format a virtual floppy according to your setting with the "Create Empty Floppy" button.

►Track type :	Specify the track format : MFM(DD) or FM (SD).
►Two sides floppy :	If checked 2 sides (DS), otherwise 1 one side floppy (SS).
►Reverse side :	Exchange side 0 and side 1.
►Track of a side grouped in the file :	If checked the first half part of the file contain side 0 track only, and the other half part side 1 track.
►Number of track :	Specify the number of track on the floppy disk.
►Sector per track :	Specify the number of sector on a track.
►Sector size :	Specify the sector size.
►Sector ID start :	Specify the starting sector ID (commonly set to 1).
►GAP3 length :	Specify the GAP3/inter sector gap length.
►Interleave :	Specify the sectors interleave.
►Skew :	Specify the tracks skew.
►Bitrate :	Specify bitrate of the floppy disk (common values are : 250000, 300000, 500000…).
►RPM :	Specify the disk rotation speed (common values are : 300, 360).

"Load" and "Create" buttons may appear grey if you have specify a track format which doesn't fit into the actual track size. The track size is computed with the RPM and bitrate parameters. In this case try to reduce the GAP3 value or correct your settings.

4.4 Floppy dump feature

This function allows you to read real floppy disks to use their images on the SDCard HxC Floppy Emulator. This tool is able to read most of ISO/IBM MFM(DD/HD) or FM (SD) floppy disk.

To be able to use this function your PC must be equipped with the right floppy disk drive (8" 5"1/4 or 3"1/2) connected to the motherboard. USB floppy disk drives are not supported.

This tool uses fdrawcmd for Windows developed by Simon Owen. You can download the lastest version of this driver on this site : http://simonowen.com/fdrawcmd

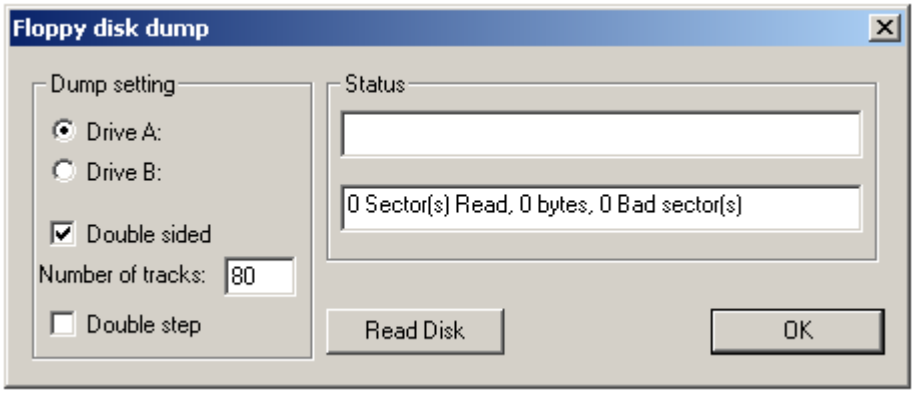


Figure 17 : The floppy dump window

The dump settings depend on the disk type you need to dump. Below you will find some safe settings:

Floppy Disk Drive model	Safe track setting
1.44MB/720KB 3"1/2	80 tracks and 2 sides.
1.2MB 5"1/4	80 tracks and 2 sides.
360KB 5"1/4	40 tracks and 2 sides.
8"	77 tracks and 2 sides.

During reading, for each track, its format (encoding mode/bitrate, number of sector, sector layout…) is automatically determined by the tool and displayed in the status field.
Once done the image of the floppy is loaded on the main window. You have to export it into HFE to use it on the emulator.

Note: The default floppy interface mode of dumped floppy disk is set to <<Generic Shugart>>. If the targeted system use another floppy interface mode (PC for example) don't forget to change this setting in the SDCard HxC Floppy Emulator settings (more details on page 19) before exporting the floppy image.

Caution: Be careful with the Number of track setting ! A too high value may damage the floppy disk drive during reading.

Note: If you are reading an 5"1/4 360KB floppy disk on an 5"1/4 1.2MB disk drive, set the Double step feature and set the number of tracks to 40.

4.5 File system based floppy generator.

The HxC Floppy Emulator software is able to generate a virtual floppy disk based on a files system. This feature allows you to generate a MS DOS or AmigaDos floppy disk containing your files.

To generate a FAT12 floppy disk, click on the “Create FS Floppy” button and choose the target floppy format (Example : 3”5 1.44MB MSDOS floppy).

Then click on the “Inject director” button and select the folder containing the floppy files / directory tree.

Once done you have just to export the created floppy image into HFE file and copy it to the SDCard.

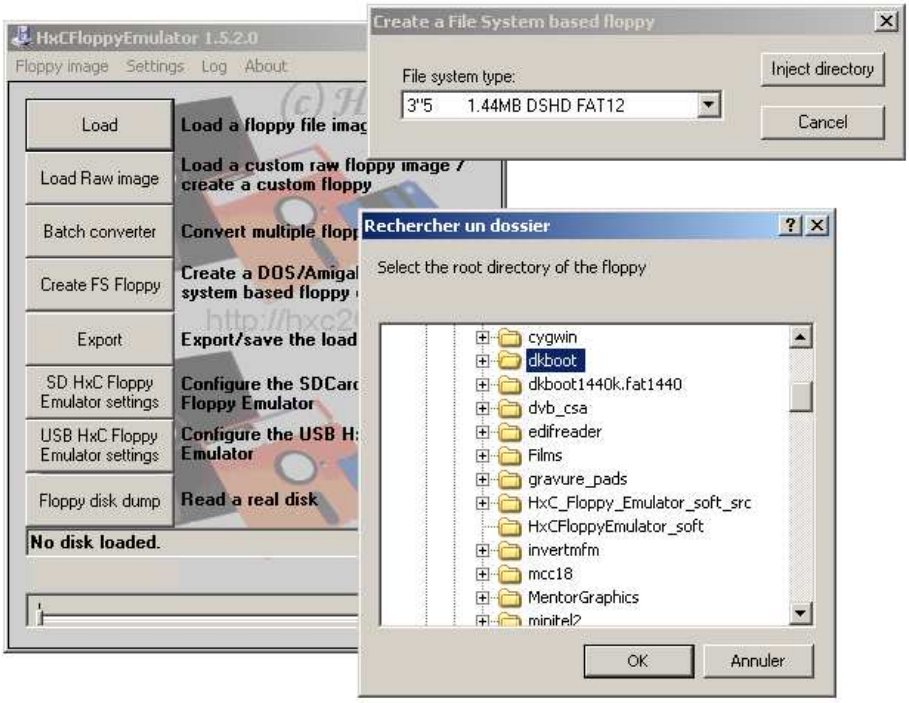


Figure 18 : Create a File system based floppy window

Note: By adding an extension to the name of the folder you can generate the floppy disk by a drag & drop of the folder on the HxC Floppy Emulator software window.
For example if you drag and drop a folder with the name “myfloppydisk.fat1440”, a 1.44MB MS DOS floppy is generated.

5 SDCard HxC Floppy Emulator file selector software

The SDCard HxC Floppy Emulator file selector software is a tool running on the host computer. This tool allows you to select floppy file image directly on the host computer keyboard and screen. In this case the LCD is optional, and only one push button is needed.
This tool is actually available on Amiga, Atari and Amstrad CPC platform.

To use this tool, copy the AUTOBOOT.HFE to the root of the SDCard and set the "Enable auto boot mode" feature (page 19 for more details).
The last version of the tool can be downloaded on the project website : http://hxc2001.free.fr/floppy_drive_emulator/index.html#download

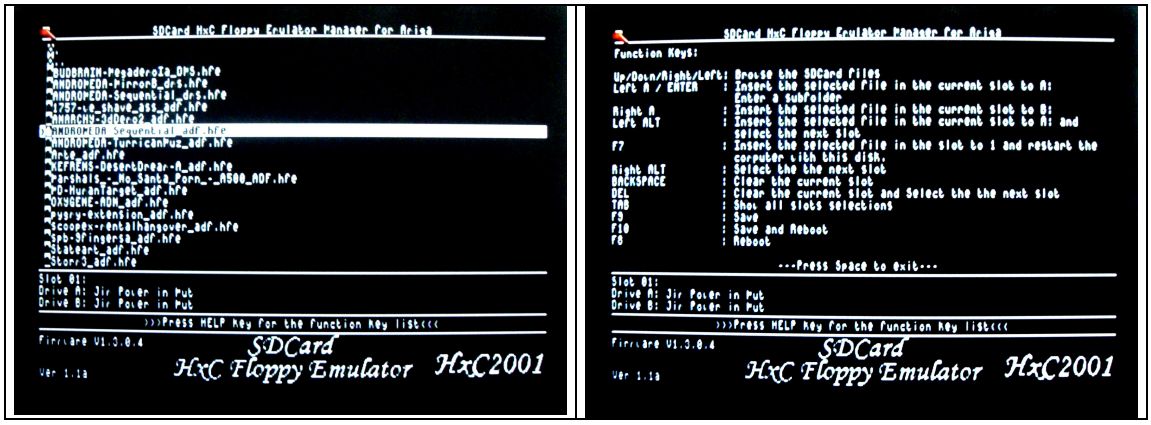


Figure 19 : File image selector main page and help page (Amiga version)

Once started you can see and browse the content of the SDCard.
To get the help page, press the key “HELP”.

Basically you can select a file image and reboot with it, or make a “slot list” with multiple disk.

Once rebooted, the floppy disk emulator buttons meaning change to:
Button ⏮ : Previous Slot.
Button ⏭ : Next Slot
Button ⏫ : Select first slot (AUTOBOOT.HFE)

Each time another image is selected the slot number is indicated by the buzzer and the SD access LED.

Note : If you press any button more than 1s, the first slot/selector software is selected. In this case only one push button is needed.

6 SDCard HxC Floppy Emulator firmware update

SDCard HxC Floppy Emulator Update procedure :

►Download the last firmware version:
http://hxc2001.free.fr/floppy_drive_emulator/SDCard_HxCFloppyEmulator_firmware.zip

►Copy the new firmware file (*.upd) to a freshly formated FAT32 SDCard.
►Insert the SDCard into the emulator.
►Press Left and Right buttons before power up and keep it pressed at least 1 seconds at power up.
►Wait some seconds .... its done !

Note 1:
The file must be unfragmented on the SDCard and must be in the first part of the root directory.
For these reasons it is recommended to use a freshly formatted FAT32 SDCard, otherwise you may get the error 4 or 6 (see note 2).

Note 2:
Bootstrap LED error messages:
Error 1 : (blink 1 time and 2 seconds pause cycle) No entry point (->no software flashed)
Error 2 : (blink 2 time and 2 seconds pause cycle) SDCard init error.
Error 3 : (blink 3 time and 2 seconds pause cycle) FAT error.
Error 4 : (blink 4 time and 2 seconds pause cycle) UPD File not found!
Error 5 : (blink 5 time and 2 seconds pause cycle) Bad UPD File header! (bad file)
Error 6 : (blink 6 time and 2 seconds pause cycle) Bad data CRC! (file corrupted)
Error 7 : (blink 7 time and 2 seconds pause cycle) Bad data size!
Error 8 : (blink 8 time and 2 seconds pause cycle) Write error (Pic flash error)

7 Technical details

7.1 Floppy interface

- HE10 34 pins floppy connector
- Shugart compatible mode supported.
- PC compatible mode supported.
- 24mA driving capability.
- Two floppy disk drives emulation.
- 300 RPM , 360 RPM supported (others RPM possible).
- Up to 255 tracks
- Up to 2 Sides

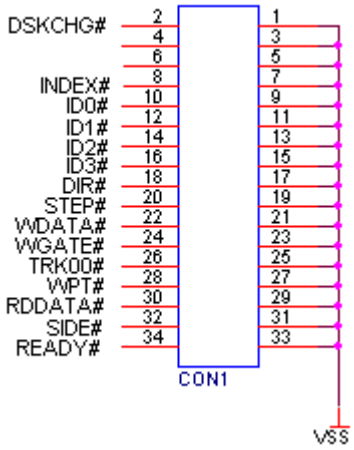


Figure 20 : Floppy connector pinout

7.2 Power supply

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

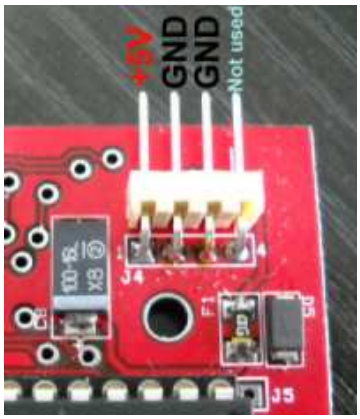


Figure 21 : Power connector pinout

7.3 User Interface

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

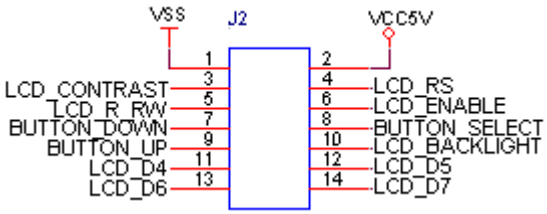


Figure 22 : Front panel connector pinout

7.4 SDCard support

- SD Card p to 2GB.
- SDHC Card supported up to 32GB.
  (10Mhz SPI bus mode. Average byte rate: ~500KB/s)

7.5 SDCard Filesystem

- FAT32 supported. Subdirectory and long name file supported.

7.6 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 (DD) 256 Bytes-sector
  - ISO MFM (DD) 512 Bytes-sector
  - ISO MFM (DD) 1024 Bytes-sector
  - ISO FM (SD) 128 Bytes-sector
  - ISO FM (SD) 256 Bytes-sector
  - ISO FM (SD) 512 Bytes-sector

- ISO FM (SD) 1024 Bytes-sector
- Amiga track write support (since the PCB revision C)
- E-mu track write support (since the PCB revision C)

7.7 Floppy bitrate supported

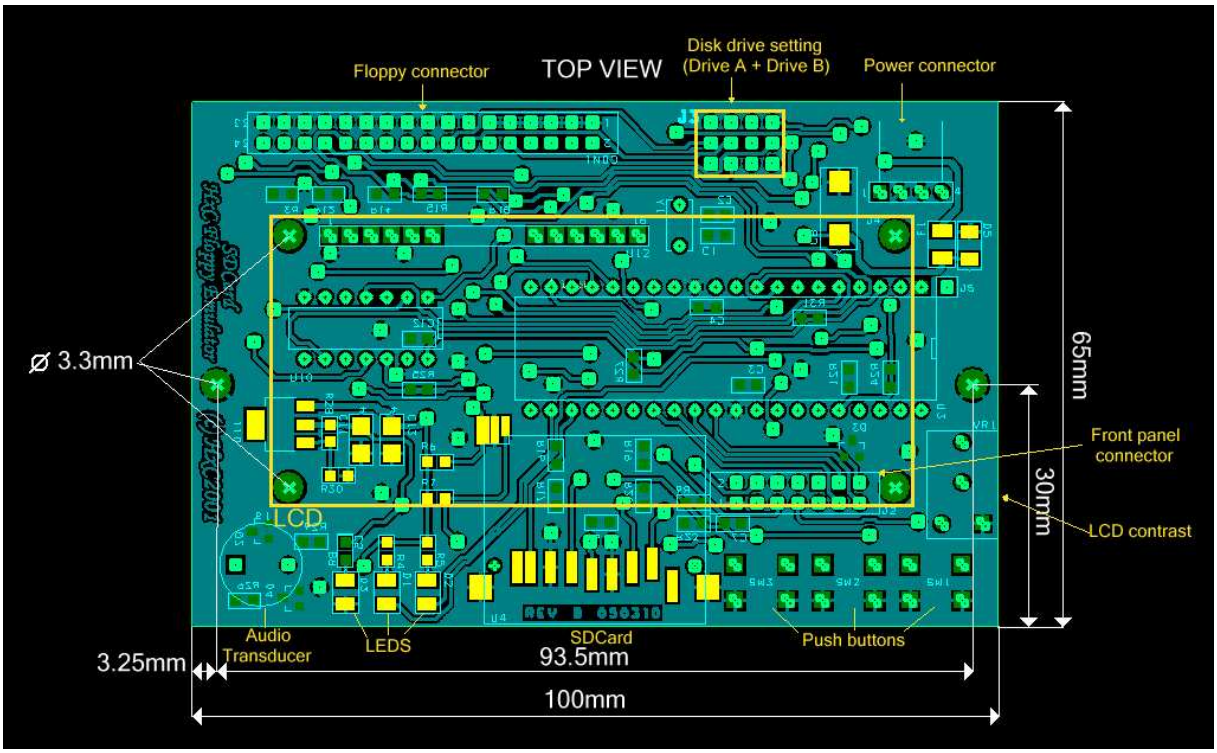
- 250/300Kbits/s (SD/DD floppies)
- 500Kbits/s (HD floppies)
  (others bit rates possible)

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

7.8 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.

7.9 Mechanical drawing



7.10 Supported file format / Input

File format / Input	Target	Notes
*.ADF	Amiga computers	
*.ADZ	Amiga computers	
*.AFI	Multiplatform	HxC Floppy Emulator file format
*.DSK (CopyQM)	Multiplatform	
*.DSK (CPC DSK)	Amstrad CPC computers	
*.DSK (MSX DSK)	MSX computers	
*.DSK (Oric DSK)	Oric computers	MicroDisc or compatible FDC needed
*.DSK (TI99 DSK)	TI99/4A computers	
*.D88	NEC PC88/PC98	
*.DIM	Atari ST computers	
*.DMS	Amiga computers	
*.DPX	Oberheim DPX	
*.EDE	Ensoniq EPS/ SQ-80/VFX-SD	
*.EM1	Emax	
*.EM2	Emax II	
*.EMX	Emax I/II	Operating system image
*.EMUFD	E-mu emulator	
*.EMUIIFD	E-mu emulator II	
*.EII	E-mu emulator II	
*.SP1200FD	E-mu SP1200	
*.EDM	Ensoniq Mirage	
*.FD	Thomson TO8D	
*.HDM	X68000	
*.HFE	Multiplatform	SD HxC Floppy Emulator file format
*.IMD	Multiplatform	
*.IMG	PC / Multiplatform	
*.IMG	Prophet 2000/2002	
*.IPF	Multiplatform	Need CAPSImg.dll
*.JV1	TRS-80	
*.JV3	TRS-80	
*.JVC	TRS-80 CoCo	
*.MFM	Multiplatform	HxC Floppy Emulator file format
*.MGT	Sam Coupé	
*.SAD	Sam Coupé	
*.MSA	Atari ST computers	
*.SAP	Thomson TO8D	
*.SCL	ZX Spectrum	
*.SMC	SNES / Super Famicom	Generate a FAT12 floppy
*.ST	Atari ST computers	
*.STT	Atari ST computers	STEem file format

*.STX	Atari ST computers	Pasti file format
*.TD0	Multiplatform	Teledisk file format
*.TRD	ZX Spectrum	
*.VDK	Dragon 64	
FAT12 file system generator	Multiplatform: PC – Keyboards/Samplers – CNC machines.	More details on the page 22
RAW floppy loader/generator.	Multiplatform. Allow you to generate a custom floppy format	More details on the page 20
Floppy reader	Multiplatform. Allow you to read a real floppy disk.	More details on the page 21

Note : This list is subject to change since new files format support are regularly added.
If you want a particular file format support don't hesitate to contact us (contact informations on page 31).

7.11 Tested Target list

Some examples of host working with the SDCard HxC Floppy Emulator.

Note: This list is not complete since the SDCard HxC Floppy Emulator should works with any host having a Shugart/IBM PC floppy interface.

	Target	Support	Notes
Computers	Atari STE	[RD][WR][HCP]	
	Atari Mega STE	[RD][WR][HCP]	
	Atari STF	[RD][WR][HCP]	
	Atari Falcon	[RD][WR][HCP]	
	Amiga 500	[RD][WR][HCP]	
	Amiga 600	[RD][WR][HCP]	
	Amiga 1200	[RD][WR][HCP]	
	Amiga 2000	[RD][WR][HCP]	
	Amstrad CPC6128	[RD][WR][HCP]	
	Amstrad CPC6128+	[RD][WR][HCP]	
	Amstrad CPC464 +DDI	[RD][WR][HCP]	
	MSX2	[RD][WR]	
	Robotron KC 85/X	[RD][WR]	
	Kaypro 4-84	[RD][WR]	
	Super Wildcard DX-SWC3201	[RD][WR]	
	TI99/4A	[RD][WR]	
	NEC PC88	[RD][WR]	
	Thomson TO8D	[RD][WR]	
	IBM PC Compatible	[RD][WR]	
	X68000	[RD][WR]	
	TRS-80	[RD][WR]	
	Sam Coupé	[RD][WR]	
	ZX Spectrum	[RD][WR]	
	Dragon 64	[RD][WR]	
	ACT/Apricot	[RD][WR]	
	PERKIN-ELMER MODEL3030	[RD][WR]	
Keyboard / Samplers	Ensoniq EPS	[RD][WR]	
	Ensoniq Mirage	[RD][WR]	
	Emax	[RD][WR]	
	Emax II	[RD][WR]	
	E-mu emulator	[RD][WR]	
	E-mu emulator II	[RD][WR]	
	Oberheim DPX1	[RD][WR]	
	Korg DSS-1	[RD][WR]	
	Yamaha Clavinova CVP-83S	[RD][WR]	
	Prophet 2000	[RD][WR]	
	Roland S-50	[RD][WR]	
	Prophet 2000	[RD][WR]	
	Roland S-50	[RD][WR]	

7.12 Contact / Project page

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.com

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

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

or contact us at this email:

Email :
hxc2001@hxc2001.com

Jean-François DEL NERO
11 Rue Frédéric Magisson
75015 PARIS
France
SIRET Number : 524662301 00026
Email : hxc2001@hxc2001.com

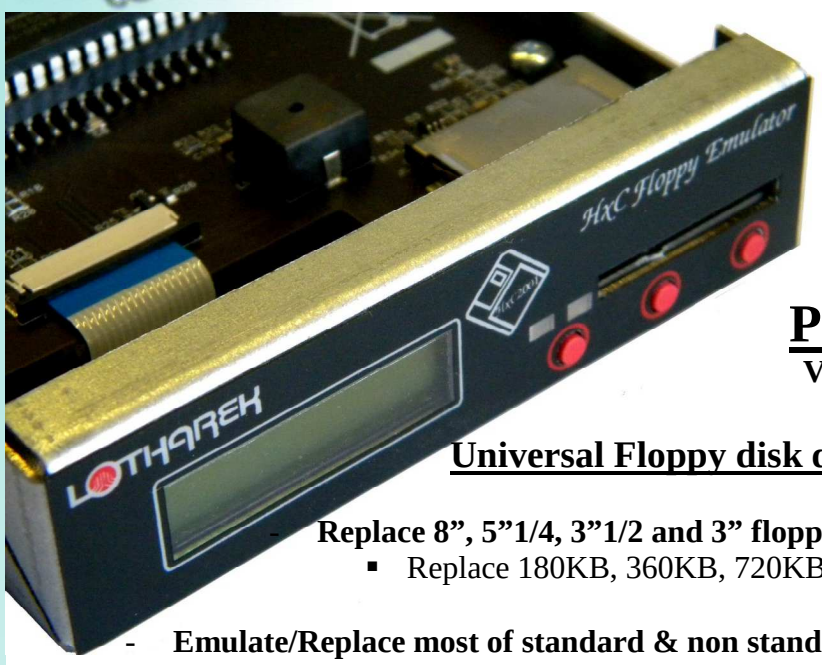
Website : http://hxc2001.com/

This product is manufactured and sold by Lotharek:

" LOTHAREK"
FHU Krawczyk Przemyslaw
41-103 Siemianowice Slaskie
Przyjazni 36 b/10
Polska/Poland
VAT: PL6312246599

Website : http://www.lotharek.pl/

SDCard HxC Floppy Emulator User Guide issued January 2011.



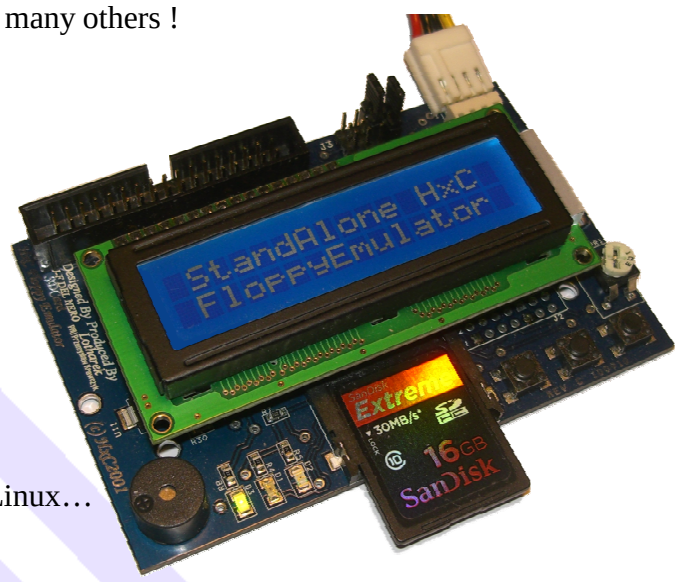
SDCard HxC Floppy Emulator

Product brief

Version 2.2-26/08/13

Universal Floppy disk drive emulator / replacement solution !

- **Replace 8”, 5”1/4, 3”1/2 and 3” floppy disk drive :**
  - Replace 180KB, 360KB, 720KB, 800KB, 1.2MB, 1.44MB disks and many others !



- **Emulate/Replace most of standard & non standard disk formats :**
  - HD (MFM 500)
  - DD (MFM 250 / MFM 300)
  - SD (FM 125 / FM 150 / FM 250)
  - Amiga format.
  - E-mu format.
  - And many others !
- **Can emulate TWO floppy disk drives with one emulator !**
- **Support SD/SDHC Card up to 32GB.**
  - FAT12,FAT16 & FAT32 based : Freely browsable under Windows/Mac OSX/Linux…
- **3”1/2 form factor !**
- **Slim 3”1/2 form factor !**

➔ Support a large variety of computers / keyboards / samplers / CNC machines

>>>**Works with most of computers, musician’s keyboards/samplers and industrial robots/machines !** <<<

- Updated support list : http://hxc2001.com/download/floppy_drive_emulator/support.htm

Your hardware is not present in this list ? Please contact us ! Your hardware is probably already supported !

➔ Multi Volumes/Floppy Images support

- **Can store thousand of virtual floppy disk on a single SD Card ! Capacitance examples:**
  - More than **8000** 1.44MB floppy disk images on a 32GB SD Card !
  - More than **16000** 720KB floppy disk images on a 32GB SD Card !

➔ Advanced User interface

- 2*16 LCD + 3 buttons :
  - Embedded file image Browser.
  - Embedded file image renaming function.
- Optional **host software browser** available for Amiga, Atari ST and Amstrad CPC computers.
- **Floppy disk drive sound emulation.**

➔ Wide software / tool support

- Floppy images manager software : **More than 60 file images types supported** !
- Floppy disk reader/dumper software : **Create floppy disks images from your floppy disks and archive them !**
- VFD support : **Browse DOS/FAT type floppy images under Windows !**
- Portable DOS image browser : **Browse DOS/FAT type floppy images under Windows XP,7,8 / MacOS X / Linux !**
- No driver installation needed !

➔ Open project

- Support forum : http://torlus.com/floppy/forum/
- Wide user community ! : The project exist since 2006 !
  - http://hxc2001.com/showroom/index.html
- Software / firmware regularly updated ! :
  - http://hxc2001.free.fr/floppy_drive_emulator/index.html#download
- Something is missing ? A special need ? Don’t hesitate to contact us ! We are maybe able to develop it !

Email :

hxc2001@hxc2001.com

The SD HxC Floppy Emulator is an universal 3", 3"1/2, 5"1/4 and 8" Floppy disk drive emulator based on SD Card. Most of disk format can be emulated by this emulator :
High density (HD – MFM), Double densisty (DD - MFM) and Single density (SD - FM) floppies are supported. Most of non-standard and standard track/sectors layout are supported. Special track format like Amiga or E-mu track are also supported in both read & write access.

This make this device very versatile and thanks to its flexibility the SD HxC Floppy Emulator support most of computers, industrial/CNC machines, musician's keyboards and samplers. Some examples of supported hardware can be found on this page : http://hxc2001.com/download/floppy_drive_emulator/support.htm

The HxC Floppy Emulator software allows you to create/convert your floppy images files or read a floppy disk for the emulator. The floppies images for the emulator can be generated from floppies images, floppy disk read, or from spares files (FAT/DOS floppy generator). The image can also be formatted by the host machine.
The list of supported file images type can be found on this page : http://hxc2001.free.fr/floppy_drive_emulator/#FILESSUPPORTED

To see the HxC Floppy Emulator in action please visit our Showroom :
http://hxc2001.com/showroom/

HxC2001

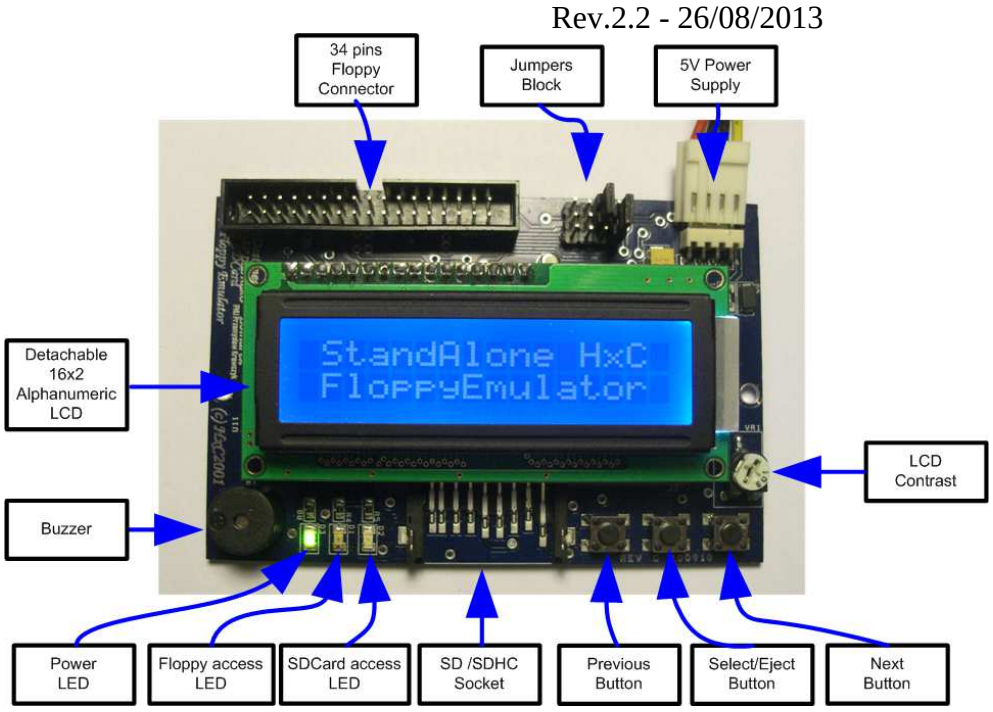
Technical details

Floppy interface:
HE10 34 pins floppy connector :
- ► Shugart compatible mode supported.
- ► PC compatible mode supported.
- ► Two floppy disk drives emulation.

Power supply:
- ► 5V +/- 10% standard power floppy connector input.
- ► 500mA max. (80mA in standby).

User Interface:
- ► 3 LEDs ("Power LED","Floppy access LED"," SD Card access LED ").
- ► 3 buttons ("Next","Select/Eject","Previous").
- ► 1 audio transducer. (Head Step and User interface sound).
- ► Detachable (Rev C) 2*16 chars Alphanumerical LCD.

(Note : LCD and buttons can be put on an external front panel)
- ► On Screen display software available for Amiga, Atari ST and CPC computers.



Rev C SD HxC Floppy Emulator

SD Card support:
- ►SD Card up to 2GB.
- ►SDHC Card supported up to 32GB.

SD Card Filesystem :
- ► FAT12, FAT16 & FAT32 supported. Subdirectory and long name file supported.

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/E-mu track...) supported**.**
  Custom tracks supported.
  Mixed sector size and geometry supported.

Rev F SD HxC Floppy Emulator
3”1/2 Form factor

- ► **Write support:**
  Any size ISO MFM (DD/HD) sector write supported. (128/256/512/1024/2048/4096/8192Bytes)
  Any size ISO FM (SD) sector write supported**.** (128/256/512/1024/2048/4096Bytes)
  Any data mark supported : 0xFB, 0xF8, 0xF9, 0xFA
  Amiga Write support.
  E-mu Write support.

- ► **Format 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 !

Floppy bitrate supported:
- ► 125/150/250Kbits/s (FM/SD floppies)
- ► 250/300Kbits/s (MFM/DD floppies)
- ► 500Kbits/s (HD floppies)

(others bitrates possible)

RPM:
- ► 300 RPM , 360 RPM supported. (any others RPM possible).

Tracks / Side:
- ► Up to 255 tracks per floppy.
- ► 1 or 2 sides.


Slim SD HxC Floppy Emulator
Slim 3”1/2 Form factor

Additional features:
- ► Firmware update via the SD Card.
- ► Last Loaded Floppy Image autostart at power up.
- ► Fast floppy image loading (<<1second), no conversion time.
- ► Floppy Emulator ready at power up! Boot sequence possible right after the power up !
- ► 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 free per floppy image file !
- ► 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 !

Some videos showing the device in action

Morbidelli Author 503 Wood working machine
Floppy disk drive retrofit

Morbidelli Author 504 Wood working machine
Floppy disk drive retrofit

Morbidelli Author 520 Wood working machine
Floppy disk drive retrofit

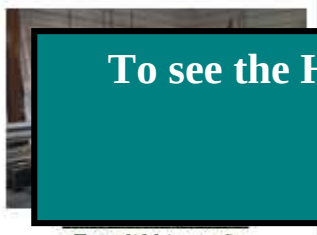
SCM TECH 90 Super Wood working machine
Floppy disk drive retrofit

Arburg Mukronics 221M Plastic Injection moulding machine Floppy disk drive retrofit

Negri Bossi NB 150 Plastic Injection moulding machine Floppy disk drive retrofit

Excellon CNC 6
Floppy disk drive retrofit

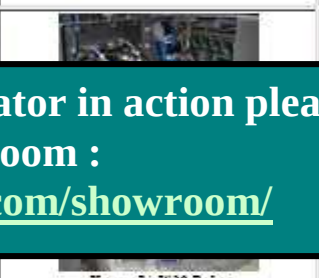
Mydata TP-9 Pick&Place Machine
Floppy disk drive retrofit



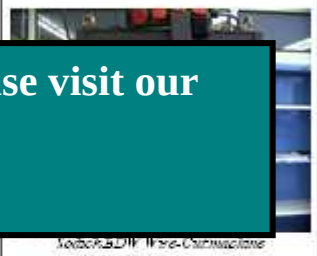
Floppy disk drive retrofit

To see the HxC Floppy Emulator in action please visit our Showroom :
http://hxc2001.com/showroom/

machine controlling
Floppy disk drive retrofit



Kawasaki JV30 Robot
Floppy disk drive retrofit



Floppy disk drive retrofit

Blume&Redecker AM2100 Coil Winder
Floppy disk drive retrofit

Tenor VPU200 3104
Floppy disk drive retrofit

Gurograph VX
Floppy disk drive retrofit

Seidt&Meyer CNC 45
Floppy disk drive retrofit

SUPRA MCS2000XL Garage Machine
Floppy disk drive retrofit

SOFD Futura32 Scanning electron microscope controller
Floppy disk drive retrofit

Bruel and Kjaer Dual Channel Real-Time Frequency Analyzer Type 2144
Floppy disk drive retrofit

Semiconductor Parameter Analyzer HP 4145A
Floppy disk drive retrofit

Custom Knitting Machine CNC
Floppy disk drive retrofit

Knitting Machine
Floppy disk drive retrofit

Jumberca Circular Knitting Machine

Brother BAS-416A
Floppy disk drive retrofit

Sales points :

This product is manufactured and sold by Lotharek : http://www.lotharek.pl

BUY Ebay : **http://search.ebay.co.uk/?sass=lotharek1977&ht=-1**

BUY SD Floppy Emulator REV F 3”1/2 : http://www.lotharek.pl/product.php?pid=42

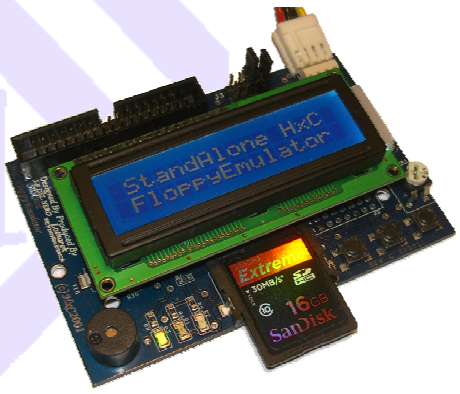
BUY SD Floppy Emulator REV F 3”1/2 (Black) : http://www.lotharek.pl/product.php?pid=104

BUY SD Floppy Emulator REV F 3”1/2 (White) : http://www.lotharek.pl/product.php?pid=105

BUY Slim SD Floppy Emulator 3”1/2 (cased HE10-34 connector): http://www.lotharek.pl/product.php?pid=101

BUY Slim SD Floppy Emulator 3”1/2 (cased ZIF connector): http://www.lotharek.pl/product.php?pid=97

BUY Slim SD Floppy Emulator 3”1/2 (Board only HE10-34 connector): http://www.lotharek.pl/product.php?pid=91



BUY SD Floppy Emulator REV C : http://www.lotharek.pl/product.php?pid=13

BUY SD Floppy Emulator REV C cased black : http://www.lotharek.pl/product.php?pid=18

Contact / Project page

Project page:
http://hxc2001.com/

Project/Support Forum:
http://www.torlus.com/floppy/forum

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

Email :
hxc2001@hxc2001.com

Jean-François DEL NERO
11 Rue Frédéric Magisson
75015 PARIS
France
SIRET N° 524 662 301 00026
VAT N° FR22524662301

Website : http://hxc2001.com/

The official producer and distributor of the HxC Floppy Emulators is Lotharek :

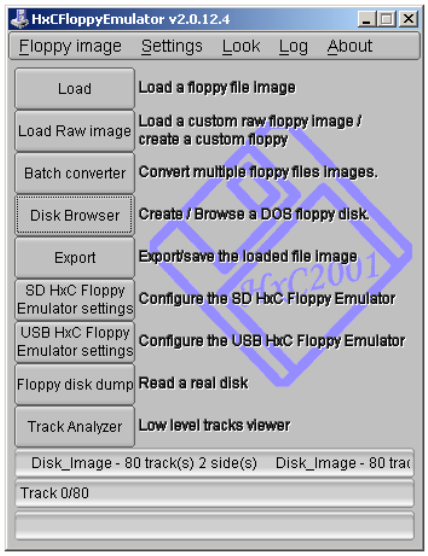
LOTHAREK
FHU Przemyslaw Krawczyk
41-103 Siemianowice Slaskie
Kościelna 34 b /25
Polska/Poland
VAT N° PL6312246599
GIOS/WEEE N° E0016247W

Website : http://www.lotharek.pl/

SD HxC Floppy Emulator Product brief issued August 2013.

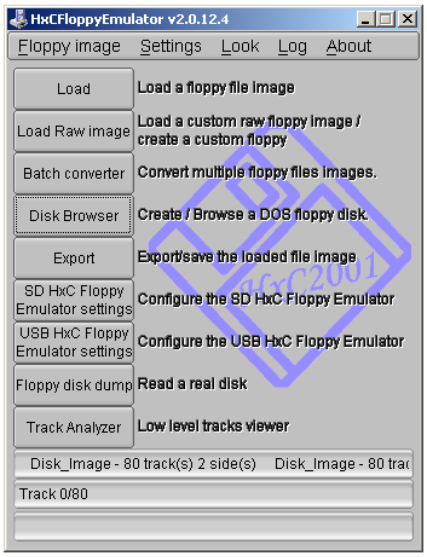
HxC Floppy Emulator Software

Step by Step Guide



Summary:

1. General description



The HxC Floppy Emulator software allows you to :

- Load/convert a large diversity of disk image types.

- Batch convert a large quantity of disk images.

- Read your floppy disks and generate disk images.

- Generate empty floppy disk images.

- Add/Read/Remove files from a DOS floppy disk image.

- Do some low level track analysis.

Since this tool is working at the floppy track level**, it support all standard and non-standard/custom floppy disk format/layout.**

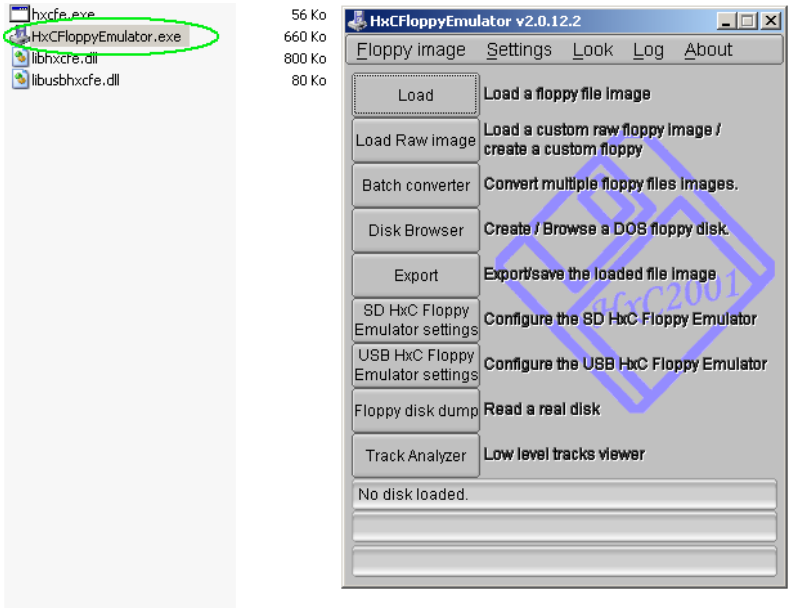
This tool can be downloaded there :
http://hxc2001.com/download/floppy_drive_emulator/HxCFloppyEmulator_soft.zip

This software is **available on Windows, MacOS X (x86) and Linux** machines.

This Step by Step guide intend to describe some basic tasks.

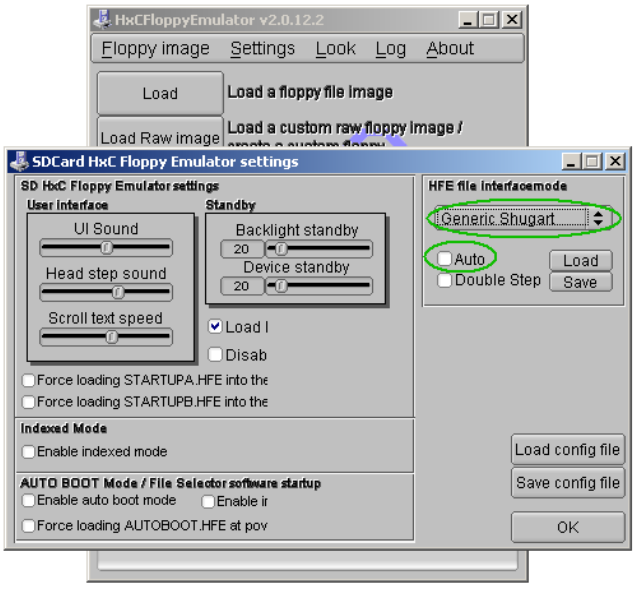
2. How to create a DOS disk image and add some files to this image ?

- Step 1 : Start the software



- Step 2 :(Optional) Change the default floppy interface mode

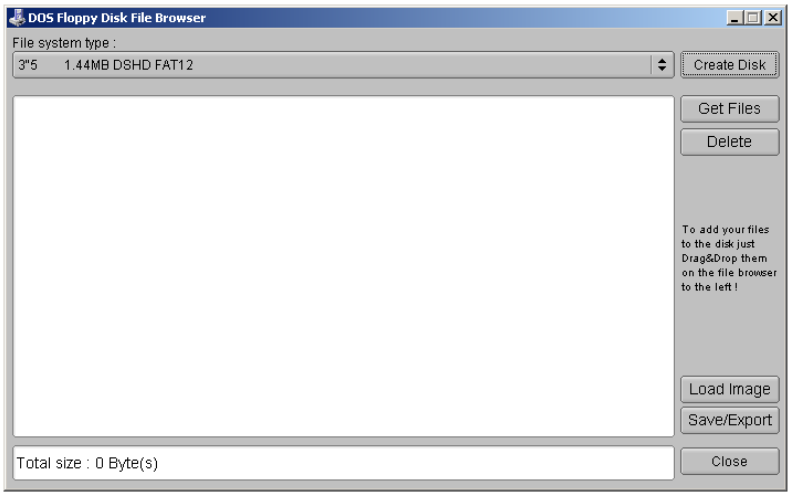
- **Step 2.a : Click on "SD HxC Floppy Emulator settings".**
- **Step 2.b : Uncheck "Auto" and choose the desired Interface mode.**



- **Step 2.c : Click on the OK button.**

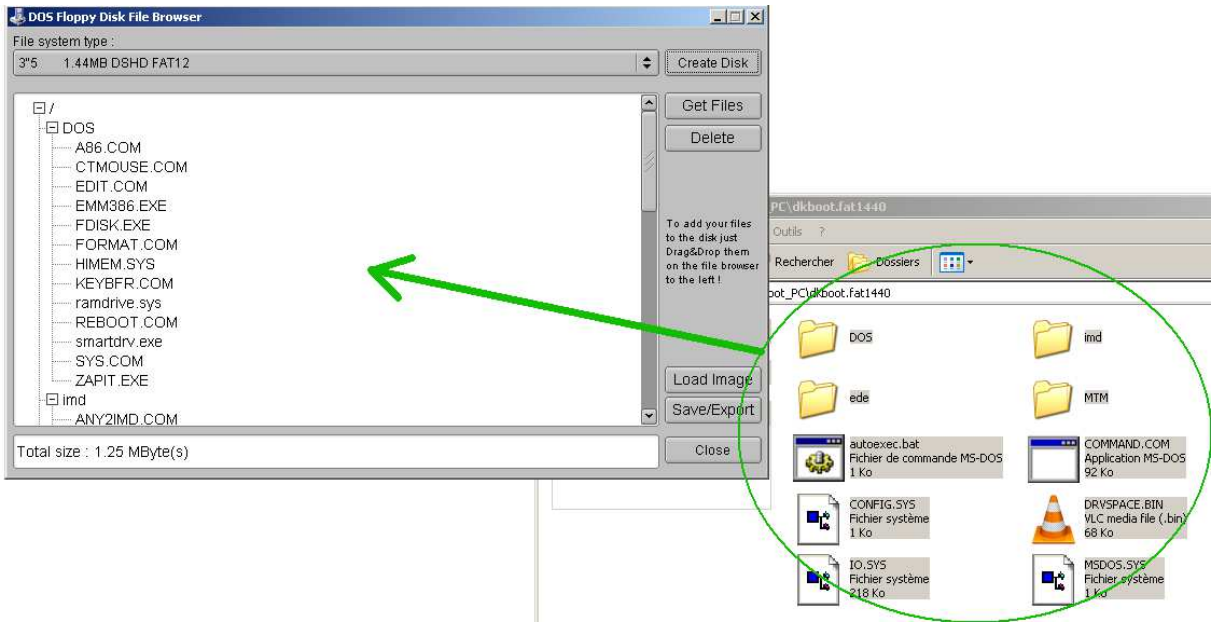
- Step 3 : Click on « Disk Browser »

- Step 4 : Choose the File system type and click on “Create Disk”



After this you can export the generated disk image or add some files to this image.

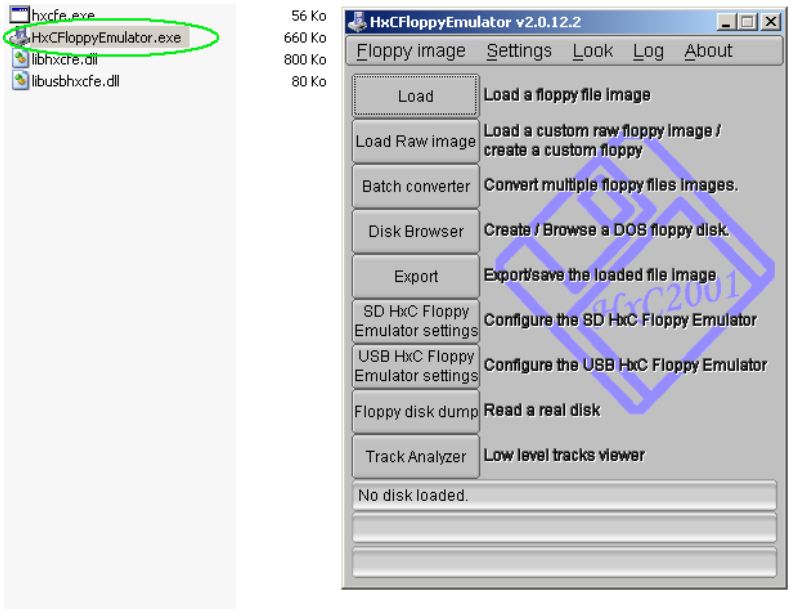
- Step 5 : To add some files to the disk image just drag & drop them to the window.



- Step 6 : Once finished, just click on “Save/Export” to save the disk image.

3. How to get files from a DOS disk image ?

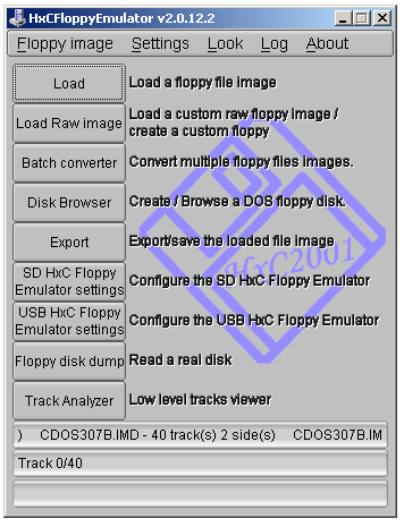
- Step 1 : Start the software



- Step 2 : Click on the button "Load"

- Step 3 : Choose your disk image

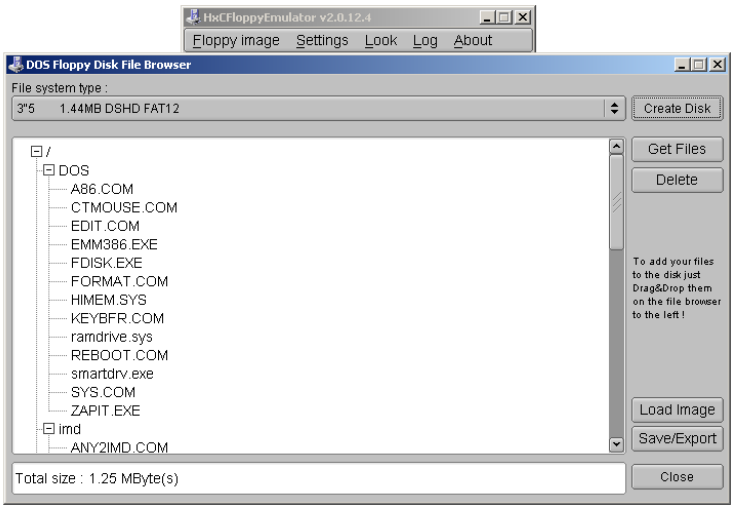
Once done the disk image is loaded into the software



Note : The disk image can also be loaded by a simple drag&drop on the main window !

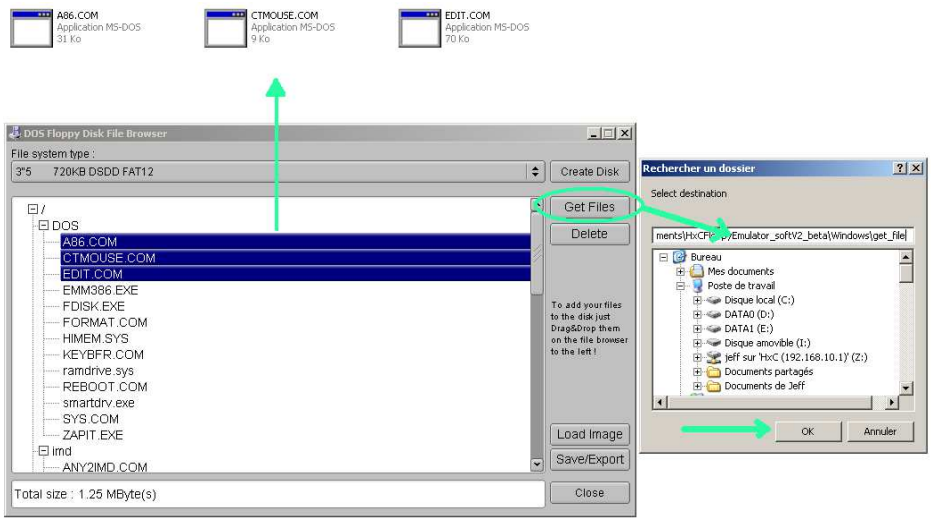
- Step 4 : Click on « Disk Browser »

You should be able to see the files & folder present in the image :



- Step 5 : Select the file(s)/folder(s) to get and press "Get Files"

- Step 6 : Choose a place on your computer to save the select file(s)/folder(s).



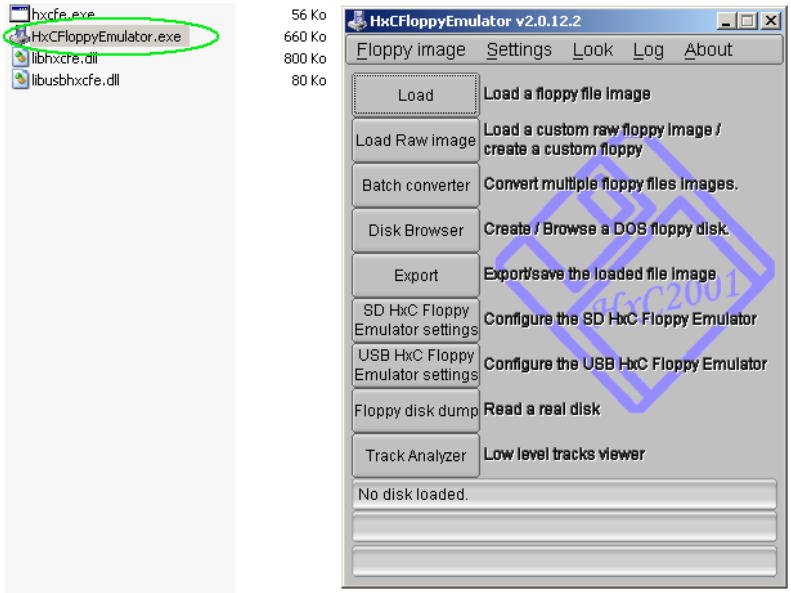
Once done the files are present into the target directory.

Note : If no file/folder is selected, the whole content of the floppy disk image will be extracted.

Note : A simplified version of this DOS image browser is available here : **http://hxc2001.com/download/floppy_drive_emulator/HxCFE_DosDiskBrowser.zip**
This software can be copied to the root of the SD Card and allows you a fast & easy access to your files.

4. How to convert a disk image for the SD HxC Floppy Emulator ?

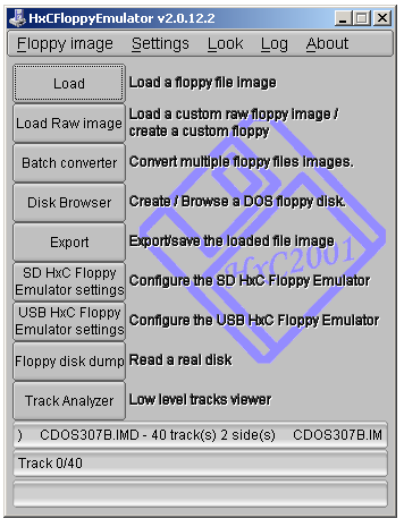
- Step 1 : Start the software



- Step 2 : Click on the button "Load"

- Step 3 : Choose your disk image

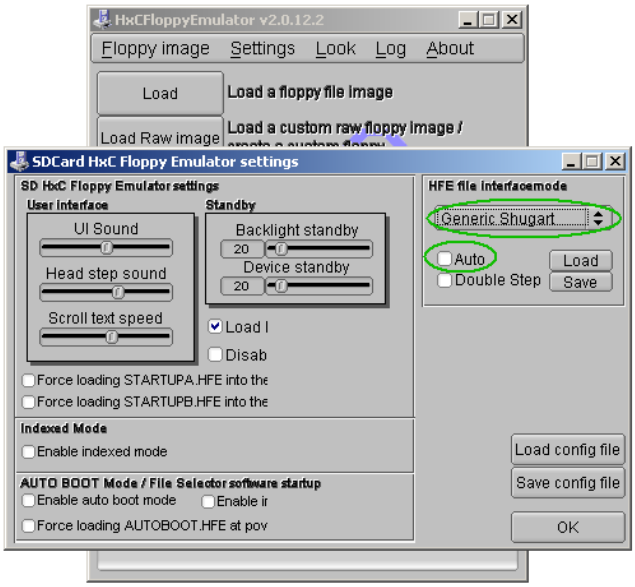
Once done the disk image is loaded into the software



Note:
The disk image can also be loaded by a simple drag & drop on the main window !

- Step 4 : (Optional) Change the default floppy interface mode

- **Step 4.a : Click on "SD HxC Floppy Emulator settings.**
- **Step 4.b : Uncheck "Auto" and Choose the desired Interface mode.**



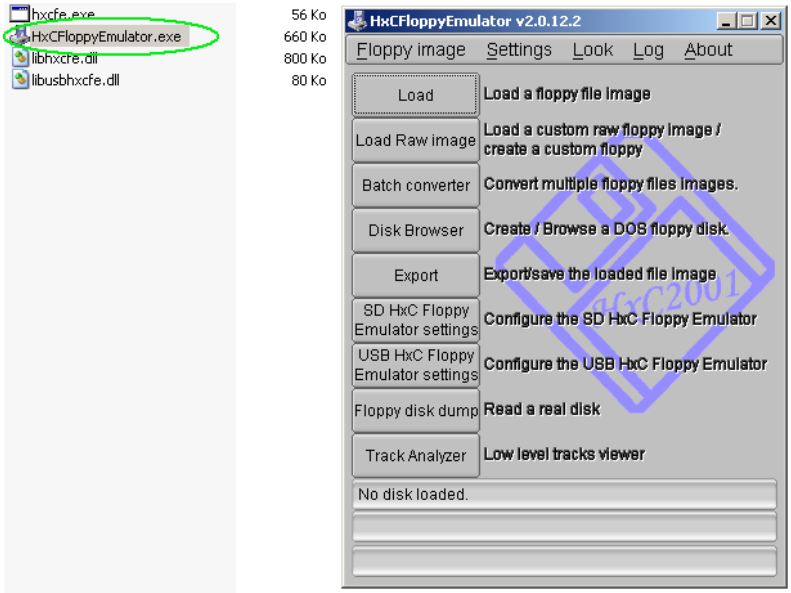
- **Step 4.c : Click on the OK button.**

- Step 5 : Click on "Export"

- Step 6 : Save the file on the SD Card.

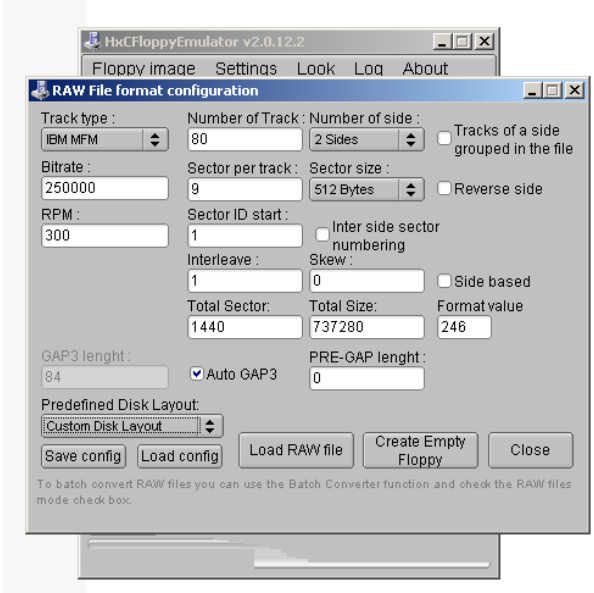
5. How to convert a RAW disk image for the SD HxC Floppy Emulator ?

- Step 1 : Start the software



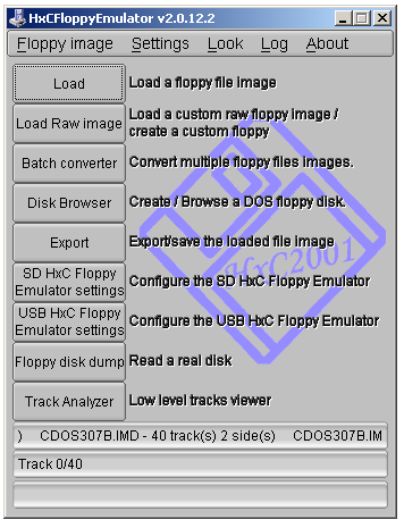
- Step 2 : Click on the button “Load Raw image”

- Step 3 : Set the desired floppy layout or choose a predefined one



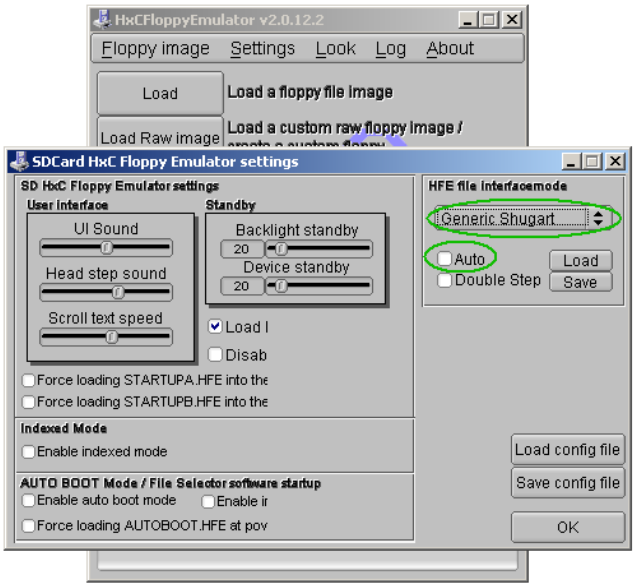
- Step 4 : Click on "Load RAW file" and choose the disk image

Once done the disk image is loaded into the software



- Step 5 : (Optional) Change the default floppy interface mode

- **Step 5.a : Click on "SD HxC Floppy Emulator settings.**
- **Step 5.b : Uncheck "Auto" and choose the desired Interface mode.**



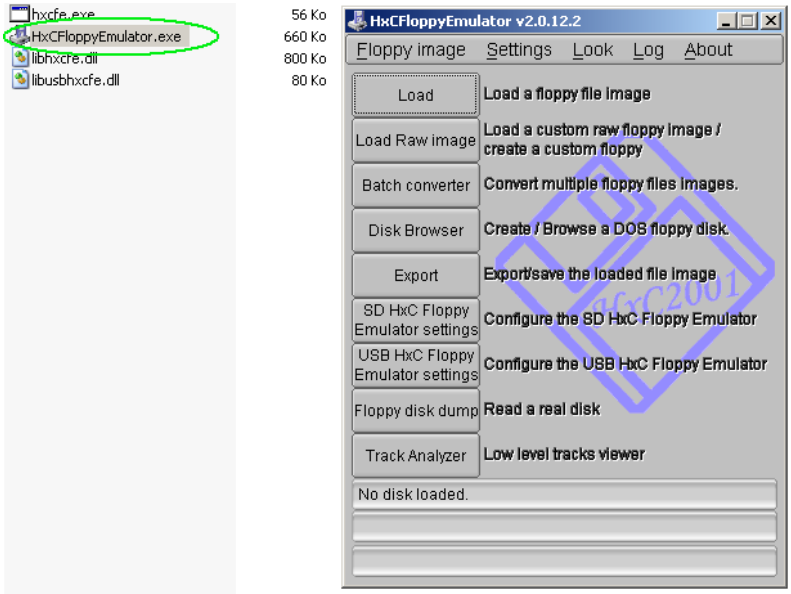
- **Step 5.c : Click on the OK button.**

- Step 6 : Click on "Export"

- Step 7 : Save the file on the SD Card.

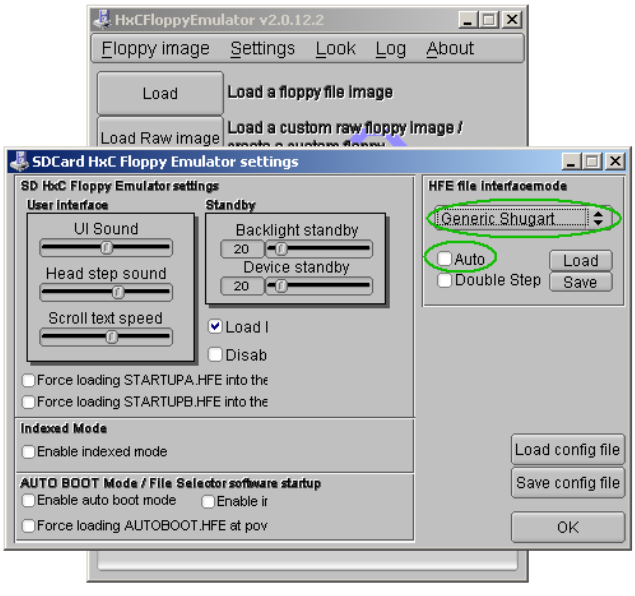
6. How to batch convert a large quantity of disk images ?

- Step 1 : Start the software



- Step 2 : (Optional) Change the default floppy interface mode

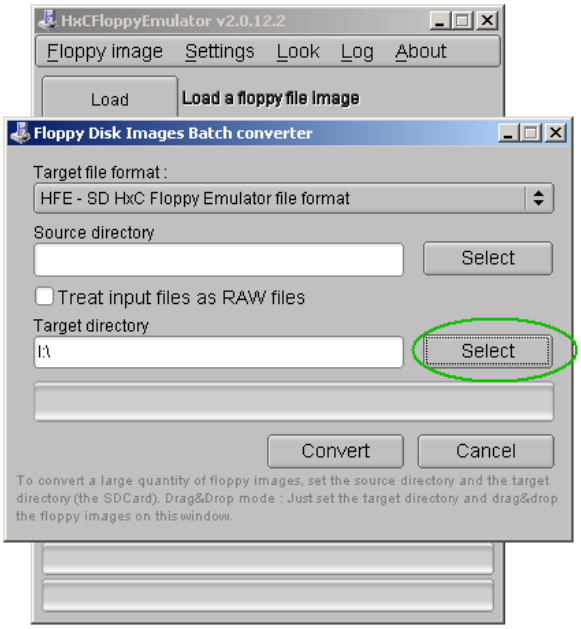
- **Step 2.a : Click on "SD HxC Floppy Emulator settings".**
- **Step 2.b : Uncheck "Auto" and Choose the desired Interface mode.**



- **Step 2.c : Click on the OK button.**

- Step 3 : Click on the button “Batch converter”

- Step 4 : Select the target directory (generally the SDCard)



- Step 5.a : Select the source directory and press “Convert”

OR

- Step 5.b : Drag and Drop the files images to convert.

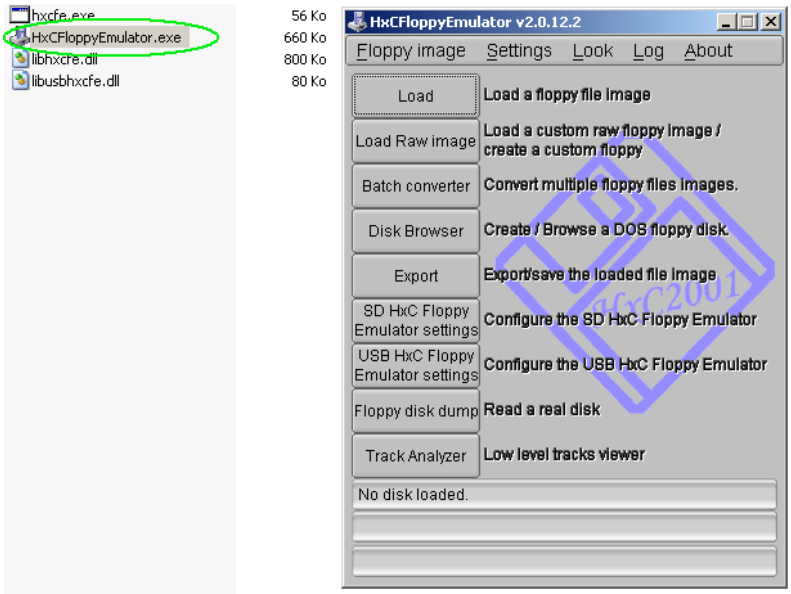
Once done the converted disk images are into the target folder.

7. How to make a disk image from a floppy disk ?

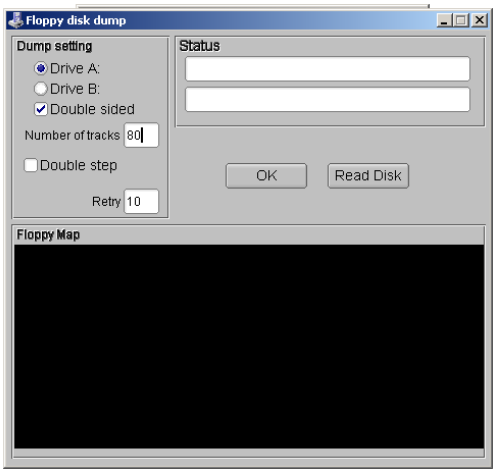
- Step 1 : (If not already done) Install the fdrawcmd driver on a PC with an internal floppy disk drive:

http://simonowen.com/fdrawcmd/#download

- Step 2 : Start the software

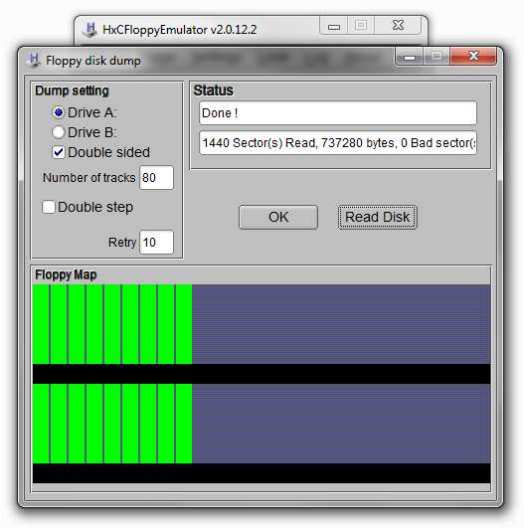


- Step 3 : Click on the button "Floppy disk dump"



- Step 4 : Insert the floppy disk and press “Read Disk”

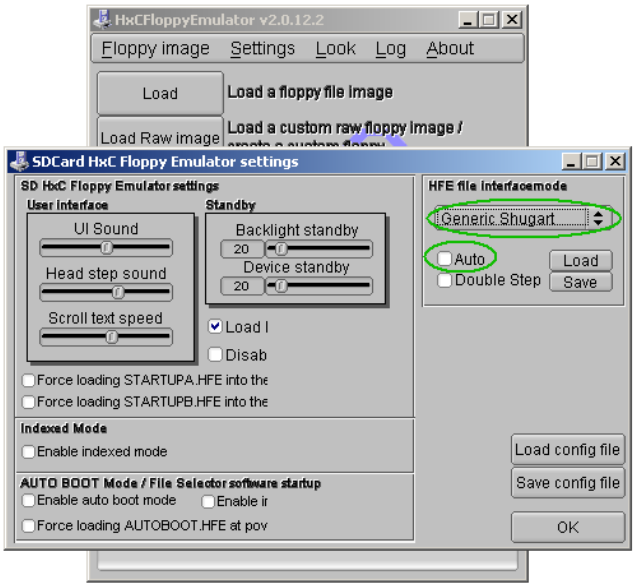
Once done the disk image is loaded into the software.



- Step 5 : Once done press “Ok”

- Step 6 :(Optional) Change the default floppy interface mode

- **Step 6.a : Click on “SD HxC Floppy Emulator settings”.**
- **Step 6.b : Uncheck “Auto” and choose the desired Interface mode.**



- **Step 6.c : Click on the OK button.**

- Step 7 : Click on “Export”

- Step 8 : Save the file on the SD Card.

8. Supported disk images

ACORN ADF Loader	*.adf	ORIC DSK Loader	*.dsk
AMIGA ADF Loader	*.adf	PROPHET 2000 Loader	*.img
AMIGA ADZ Loader	*.adz	RAW Sector loader	*.img
AMIGA DMS Loader	*.dms	Roland W30 file Loader	*.w30
AMIGA EXTENDED ADF Loader	*.adf	SAM COUPE MGT Loader	*.mgt
AMIGA FS Loader	*.amigados	SAM COUPE SAD Loader	*.sad
AMIGA OLD EXTENDED ADF Loader	*.adf	SD Card HxCFE EXTENDED HFE	*.hfe
Amstrad CPC (E)DSK Loader	*.dsk	SD Card HxCFE HFE file Loader	*.hfe
Apple II NIB Loader	*.nib	Speccy DOS SDD File Loader	*.sdd
APRIDISK Loader	*.dsk	SPS IPF Loader (caps lib needed)	*.ipf
ATARI ST DIM Loader	*.dim	Super famicom SMC Loader	*.smc
ATARI ST MSA Loader	*.msa	Sega System 24 loader	*.s24
ATARI ST ST Loader	*.st	TELEDISK TD0 Loader	*.td0
ATARI ST STT Loader	*.stt	THOMSON FD Loader	*.fd
Atari ST STX/Pasti Loader	*.stx	THOMSON TO8D SAP Loader	*.sap
BBC ADL floppy image loader	*.adl	TI99 4A PC99 Loader	*.pc99
BBC SSD & DSD floppy image loader	*.dsd	TI99 4A V9T9 Loader	*.v9t9
C64 D81 Loader	*.d81	TRS80 DMK Loader	*.dmk
CAMPUTERSLYNX Loader	*.ldf	TRS80 JV1 Loader	*.jv1
Casio FZF file Loader	*.fzf	TRS80 JV3 Loader	*.jv3
COPYQM IMG Loader	*.dsk	TRS80 JVC Loader	*.jvc
DRAGON32 & 64 VDK Loader	*.vdk	VEGAS6809 image Loader	*.veg
EMAX EM1 & EM2 Loader	*.em1	VTR IMG Loader	*.vtr
E-mu Emulator I dsk Loader	*.emufd	X68000 HDM file Loader	*.hdm
E-mu Emulator II *.eii Loader	*.eii	Zx Spectrum FDI Loader	*.fdi
E-mu Emulator II / SP1200 dsk Loader	*.emuiifd	Zx Spectrum SCL Loader	*.scl
ENSONIQ EDE/A/S/T/V Loader	*.ed?	Zx Spectrum TRD Loader	*.trd
ENSONIQ GKH Loader	*.gkh		
Ensoniq mirage EDM Loader	*.edm		
FAT12/MS DOS Loader	*.fat		
HxC AFI file loader	*.afi		
HXC MFM IMG Loader	*.mfm		
IBM PC IMG Loader	*.img		
IBM PC IMZ Loader	*.imz		
ImageDisk IMD file Loader	*.imd		
KryoFlux Stream Loader	*.raw		
MSX DSK Loader	*.dsk		
NEC D88 Loader	*.d88		
Oberheim DPX Loader	*.dpx		

9. HxC Floppy Emulator Software User Guide Disclaimer

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The Software and Firmware are regularly updated.
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http://hxc2001.com

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

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HxC Floppy Emulator Software User Guide issued May 2013.

SD HxC Floppy Emulator HFE File format

(Note : All data in this file are subject to change)

The HFE file format is an optimized floppy image format for the SD HxC Floppy Emulator hardware (PIC18F based).

First part : 0x0000-0x0200 (512 bytes) : File header

```
typedef struct picfileformatheader_
{
        unsigned char HEADERSIGNATURE[8];   // “HXCPICFE”
        unsigned char formatrevision;       // Revision 0
        unsigned char number_of_track;      // Number of track in the file
        unsigned char number_of_side;       // Number of valid side (Not used by the emulator)
        unsigned char track_encoding;       // Track Encoding mode
                                            // (Used for the write support - Please see the list above)
        unsigned short bitRate;             // Bitrate in Kbit/s. Ex : 250=250000bits/s
                                            // Max value : 500
        unsigned short floppyRPM;           // Rotation per minute  (Not used by the emulator)
        unsigned char floppyinterfacemode;  // Floppy interface mode. (Please see the list above.)
        unsigned char dnu;                  // Free
        unsigned short track_list_offset;   // Offset of the track list LUT in block of 512 bytes
                                            // (Ex: 1=0x200)
        unsigned char write_allowed;        // The Floppy image is write protected ?
        unsigned char single_step;          // 0xFF : Single Step – 0x00 Double Step mode
        unsigned char track0s0_altencoding; // 0x00 : Use an alternate track_encoding for track 0 Side 0
        unsigned char track0s0_encoding;    // alternate track_encoding for track 0 Side 0
        unsigned char track0s1_altencoding; // 0x00 : Use an alternate track_encoding for track 0 Side 1
        unsigned char track0s1_encoding;    // alternate track_encoding for track 0 Side 1
}picfileformatheader;
```

floppyinterfacemode values :

```
#define IBMPC_DD_FLOPPYMODE                     0x00
#define IBMPC_HD_FLOPPYMODE                     0x01
#define ATARIST_DD_FLOPPYMODE                   0x02
#define ATARIST_HD_FLOPPYMODE                   0x03
#define AMIGA_DD_FLOPPYMODE                     0x04
#define AMIGA_HD_FLOPPYMODE                     0x05
#define CPC_DD_FLOPPYMODE                       0x06
#define GENERIC_SHUGGART_DD_FLOPPYMODE          0x07
#define IBMPC_ED_FLOPPYMODE                     0x08
#define MSX2_DD_FLOPPYMODE                      0x09
#define C64_DD_FLOPPYMODE                       0x0A
#define EMU_SHUGART_FLOPPYMODE                  0x0B
#define S950_DD_FLOPPYMODE                      0x0C
#define S950_HD_FLOPPYMODE                      0x0D
#define DISABLE_FLOPPYMODE                      0xFE
```

track_encoding / track0s0_encoding / track0s1_encoding values :

#define ISOIBM_MFM_ENCODING	0x00
#define AMIGA_MFM_ENCODING	0x01
#define ISOIBM_FM_ENCODING	0x02
#define EMU_FM_ENCODING	0x03
#define UNKNOWN_ENCODING	0xFF

Note :

If track0s0_altencoding is set to 0xFF, track0s0_encoding is ignored and track_encoding is used for track 0 side 0.
If track0s1_altencoding is set to 0xFF, track0s1_encoding is ignored and track_encoding is used for track 0 side 1.

Second part : (up to 1024 bytes) : Track offset LUT

```
typedef struct pictrack_
{
        unsigned short offset;      // Offset of the track data in block of 512 bytes (Ex: 2=0x400)
        unsigned short track_len;   // Length of the track data in byte.
}pictrack;
```

For a disk of 80 tracks there are a table of 80 pictrack structure.

pictrack[80];

Third part : Track data

A track data is a table containing the bit stream of a track of the floppy disk. A track can contain a MFM / FM / GCR or a custom encoding.

The track is divided in block of 512bytes and each block contains a part of the Side 0 track and a part of the Side 1 track:

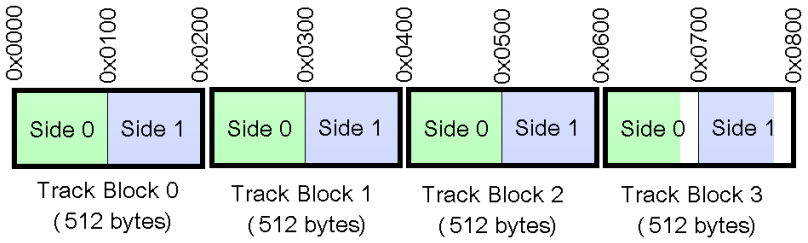


Figure 1 : A track data

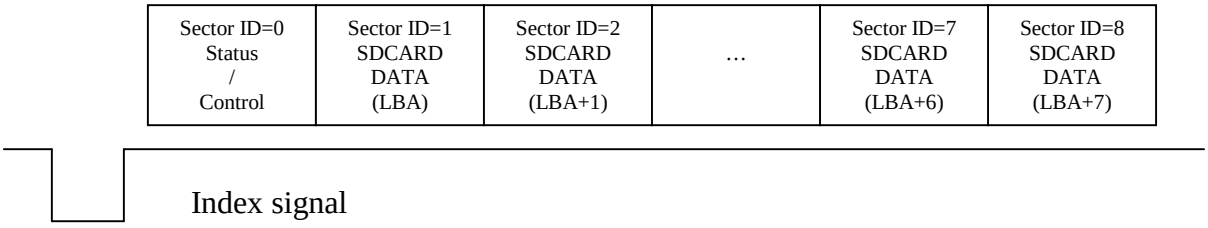
The bits transmitting order to the FDC is :
Bit 0-> Bit 1-> Bit 2-> Bit 3-> Bit 4-> Bit 5-> Bit 6-> Bit 7->(next byte)

SD HxC Floppy Emulator Direct Access mode

(Note : All informations in this file are subject to change)

The Direct Access mode can be used by host computer to access directly to the SD Card sectors. All sectors of the SD Card can be read/write by the host computer. By this way up to 32GB of data can be accessed through the floppy disk interface. This feature allows the development of file images selector software or hard disk driver.

To activate this mode, the host computer must move the head to the track 255. Once done, the emulator leave the floppy disk image mode and provide this track layout at the side 0 :



This track is in MFM DD (250Kbits/s) format.

Status/Control sector :

The status/control sector is the interface to change the LBA address, and get the status of the interface. This sector is updated at each revolutions.

Data sectors :

These sectors are mapped over some SD Card Sector. The SD Card base sector are selected with the LBA parameter.

Some examples :

To READ sector 0x00100004 of the SD Card :

- ➔ Change the LBA to 0x00100000 (see Status/Control sector Write & commands chapter)
- ➔ Read The sector ID 5 (LBA+4)

To Write sector 0x00100002 of the SD Card :

- ➔ Change the LBA to 0x00100000 (see Status/Control sector Write & commands chapter)
- ➔ Write The sector ID 3 (LBA+2)

Status/Control sector Read:

```
typedef struct direct_access_status_sector_
{
	char DAHEADERSIGNATURE[8]; // contain -> HxCFEDA\0
	char FIRMWAREVERSION[12];   // firmware version (null terminated)
	unsigned long lba_base;		// Actual SD Card LBA base address
	unsigned char cmd_cnt;		// Command counter – incremented at each command passed
	unsigned char read_cnt;		// Read counter – incremented at each revolution.
	unsigned char write_cnt;	// Write counter – incremented at each sector write.
	unsigned char last_cmd_status;	// Status of the last command passed : 0=no error.
	unsigned char write_locked;	// Write to the SD Card locked.
	unsigned char keys_status;	// Push buttons states.
	unsigned char sd_status;	// SD Card status ->0x00 init ok ! / 0xFF non present/error
	unsigned char SD_WP;		// SD Card write protect state
	unsigned char SD_CD;		// SD Card detect state
	unsigned char number_of_sector;	// Number of data sector following this status sector
	unsigned short current_index;	// Current index selected (Indexed & file selector mode).
}direct_access_status_sector;
```

The remaining bytes of the sector are unused/set to 0x00.

Status/Control sector Write :

```
typedef struct direct_access_cmd_sector_
{
	char DAHEADERSIGNATURE[8]; // Must be set to “HxCFEDA\0”
	unsigned char cmd_code;		// Command code
	unsigned char parameter_0;	// Parameter 0
	unsigned char parameter_1;	// Parameter 1
	unsigned char parameter_2;	// Parameter 2
	unsigned char parameter_3;	// Parameter 3
	unsigned char parameter_4;	// Parameter 4
	unsigned char parameter_5;	// Parameter 5
	unsigned char parameter_6;	// Parameter 6
	unsigned char parameter_7;	// Parameter 7
	unsigned char cmd_checksum;	// Parameters checksum
}direct_access_cmd_sector;
```

The remaining bytes of the sector must be set to 0x00.

Command set:

CMD_NOP : 0x00

This command does nothing.

Note : Once a SD Card is removed from the slot, “sd_status” is changed to 0xFF.
To detect the reinsertion of a SD Card the CMD_NOP should be passed until the sd_status is changed to 0x00.

CMD_SET_LBA : 0x01

This command change LBA base address and the number of sector to read/write:

parameter_0 = LBA[7..0]
parameter_1 = LBA[15..8]
parameter_2 = LBA[23..16]
parameter_3 = LBA[31..24]
parameter_4 need to be set to 0xA5 or 0x5A to be able to write on SD Card sector. The value 0x5A disable the SD Card read. This is useful to make write burst into the SD Card.
parameter_5 Number of sector to read or write. If set to 0 the default value 8 is used.

Data sectors follow the Status/Control sector. The number of data sector is set into the parameter_5 register. Each data sector contain an SD Card LBA sector: LBA, LBA+1, LBA+2,…LBA+(parameter_5-1).

CMD_SET_TRACK_POS : 0x02

This command change the track position.

parameter_0 = Disk drive A track position.
parameter_1 = Disk drive B track position.

If all disk drive leave the track 255 position, the emulator come back into the normal mode/floppy disk image mode.

CMD_SET_TRACK_POS : 0x03

This command enable/disable the 300RPM mode.

parameter_0 = 0x00 -> No RPM speed control.
parameter_0 = 0xFF ->RPM forced to 300RPM if the number of sector per rotation allows it.

CMD_SELECT_IMAGE_INDEX : 0x04

(Note : Firmware v1.8.2.16 or up needed)

When the floppy emulator is in indexed mode or file selector mode this command allows to select the image number to load.

parameter_0 = Image number to load (LSB)
parameter_1 = Image number to load (MSB)

The last selected/loaded image can be read in the current_index field of the status sector.

SDCard HxC Floppy Emulator HXCSDFE.CFG File format

(Note : All informations in this file are subject to change)

First part : 0x0000-0x0200 (512 bytes) : File header

```
typedef struct cfgfile_
{
        char signature[16];                 //"HXCFECFGV1.0"
        unsigned char step_sound;           //0x00 -> off 0xFF->on
        unsigned char ihm_sound;            //0x00 -> off 0xFF->on
        unsigned char back_light_tmr;       //0x00 always off, 0xFF always on, other -> on x second
        unsigned char standby_tmr;          //0xFF disable, other -> on x second
        unsigned char disable_drive_select;//0xFF disable the drive selection menu.
        unsigned char buzzer_duty_cycle;  // Set to 0x60
        unsigned char number_of_slot;       // If  != 0 -> Slot mode – total number of slot
        unsigned char slot_index;           // Last slot index selected
        unsigned short update_cnt;          // Incremented at each write of the config file
        unsigned char load_last_floppy;     // 0xFF -> Do not load the last loaded image at power up.
        unsigned char buzzer_step_duration; // Set to 0xD8
        unsigned char lcd_scroll_speed;       // Default value : 0x96
}cfgfile;
```

Second part : 0x0200-0x0400 (512 bytes) : Last loaded images (non-slot mode)

0x0200:
struct ShortDirectoryEntry DirEnt; <- Last loaded floppy image Fat32 entry (drive A).
0x0240
struct ShortDirectoryEntry DirEnt; <- Last loaded floppy image Fat32 entry (drive B).

Third part 0x0400-0x8400 (variable) : Slot list

Slot 0: (Note : Slot 0 not used -> correspond to the AUTOBOOT.HFE slot)
0x0400:
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive A floppy image Fat32 entry.
0x0440
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive B floppy image Fat32 entry.

Slot 1:
0x0480:
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive A floppy image Fat32 entry.
0x04C0
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive B floppy image Fat32 entry.

Slot 2:
0x0500:
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive A floppy image Fat32 entry.
0x0540
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive B floppy image Fat32 entry.

….
….
….

Slot 255:
0x8380:
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive A floppy image Fat32 entry.
0x83C0
struct ShortDirectoryEntry DirEnt; <- Slot 0 Drive B floppy image Fat32 entry.

ShortDirectoryEntry Struct :

```
struct ShortDirectoryEntry {
        unsigned char name[12];          // Short name
        unsigned char attributes;        // File attribute
        unsigned long firstCluster;      // File cluster
        unsigned long size;              // File size
        unsigned char longName[17];      // Long name (truncated)
};
```