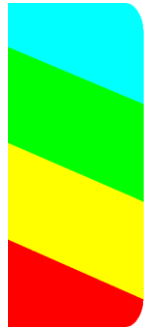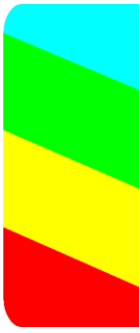# The
DivMMC EnJOY!
PRO MINI lite
with *esxDOS* 0.8.6

SD card interface for the Sinclair ZX Spectrum

Manual

Read this manual before using the DivMMC EnJOY! PRO MINI lite interface!

Manufactured by Ben Versteeg

BYTEDELIGHT

Overview

With the DivMMC EnJOY! PRO MINI lite you can load software into your ZX Spectrum easily!

The DivMMC EnJOY! PRO MINI lite is the little brother of the DivMMC EnJOY! PRO ONE interface, which is the most featured storage interface for the ZX Spectrum.
But the DivMMC EnJOY! PRO MINI lite is the affordable alternative without case or joystick port.

Features

The DivMMC EnJOY! PRO MINI lite comes with ESXDOS, which is FAT and FAT32 compatible, and hence no additional pc software is needed.
The most used file type on ESXDOS is .TAP, which can contain a complete ZX Spectrum game in one file. Other supported formats are SNA and Z80 snapshot files and TRD files.
Check out www.worldofspectrum.org for many ZX Spectrum titles.
You can also load and save separate files directly from and to the SD card!

There is an NMI button for an easy break-in menu with lots of functions such as easy browsing and selecting a game.
And there is a reset button.

The DivMMC EnJOY! PRO MINI lite auto-detects the ZX Spectrum model, so no manual configuration is needed for that!
It is also 'clock-independent' which will make it work with ZX Spectrum models such as the Spanish Investronica ZX Spectrum 128.
Also the DivMMC EnJOY! PRO MINI lite has an improved power circuit which makes it very reliable.

Compatibility

The DivMMC EnJOY! PRO MINI lite is fully compatible with:
-    All Sinclair ZX Spectrum models: 16K, 48K, 48K+, 128K, +2, +2A, +2B, +3
-    ZX Spectrum +3e ROMs
-    The Spanish Investronica ZX Spectrum+ and Investronica ZX Spectrum 128K
-    Many clones like the Harlequin kits and Sparrow Lite
-    Timex Computer TC2048
-    Kempston Mouse Turbo 2017 interface
-    ZX-HD HDMI interface
-    ZX-AY external audio interface

In the box

Your DivMMC EnJOY! PRO MINI lite interface is delivered with an SD card and this manual.
The card is formatted and contains some ZX Spectrum software for you to try instantly when you use your DivMMC EnJOY! PRO MINI lite for the first time, without having to download software first.

Notification LEDs

The DivMMC EnJOY! PRO MINI lite has two notification LEDs.
The 'POWER' LED indicates the ZX Spectrum with DivMMC EnJOY! PRO MINI lite is powered on.
And the 'CARD' LED shows the SD card activity.

Please read these instructions carefully before powering on your system with the DivMMC EnJOY! PRO MINI lite

Make sure the ZX Spectrum's edge connector is clean

It's important that your ZX Spectrum has a clean edge connector when connecting any add-on to it – many problems and even defects have been caused by dirty edge connectors in the past.
Advised is to use cotton swabs with pure alcohol.

Enabling or disabling ESXDOS

By default, ESXDOS is enabled, making it possible to access the FAT or FAT32 formatted SD card with BASIC commands, and using the NMI Browser by pressing the NMI button.

However, there are some situations you might need to disable ESXDOS, for example if you want to use the +3e ROMS which allow direct SD card access from +3 BASIC on a ZX Spectrum +3.

Another situation for which you need to disable ESXDOS is when you want to upgrade the ESXDOS firmware.
Detailed instructions for this are found on this website: http://www.bytedelight.com/?p=140

A DIP switch is in the 'ON' position when pushed down like this:

DIP SWITCH	
ON	ESXDOS ENABLED (default)
OFF	ESXDOS DISABLED / firmware upgrade mode

Connecting the DivMMC EnJOY! PRO MINI lite

Always disconnect the power from your ZX Spectrum before connecting any interface!

When powered off, connect the DivMMC EnJOY! PRO MINI lite to your ZX Spectrum carefully and insert the SD card.
Now you can power up your ZX Spectrum.

Powering up with the DivMMC EnJOY! PRO MINI lite connected

When you power on your DivMMC EnJOY! PRO MINI lite interface, you should briefly see a black screen shown here at the right, with the ESXDOS logo and information about the card detected, and system files that are being loaded.

If you do not see this black boot-screen, or the system files are not being loaded properly, please check this website: troubleshoot.bytedelight.com.

ByteDelight Introduction program
After the ZX Spectrum with DivMMC EnJOY! PRO MINI lite has finished (cold) booting, the introduction program will load automatically.
You may end this pressing S, or pressing D to disable it with the next boot.

USR 0 Mode
When the ZX Spectrum with DivMMC EnJOY! PRO MINI lite boots up, it will enter 48 BASIC.
If you are using a ZX Spectrum 128K / +2 / +2A / +2B or +3: it will enter 48 BASIC in the so-called 'USR 0 mode', which supports 128K software and the 3-channel audio chip, but it will not enter 128 BASIC or +3 BASIC.
Any 128K program however will run fine.

Using the DivMMC EnJOY! PRO MINI lite

Loading a game with the NMI Browser
This is the simplest way of loading a game or program.
Press the NMI button at any time and the NMI Browser will appear. Press H for a help screen.
Use the cursor keys or keys 6 or 7 to select a file. Press ENTER to load and run it.
More info about the NMI Browser is found in the separate 'NMI Browser' paragraph.

Getting software on the memory card
Disconnect power from your ZX Spectrum, pull the SD card from the DivMMC EnJOY! PRO MINI lite, put the SD card into a card reader on your PC or laptop and copy your files to the SD card.

Visit **www.worldofspectrum.org** *to download lots of games and other software!*

Please note that a maximum of 704 files per folder is supported.
When having more files than that, split the file-set in subfolders.

Supported emulator file formats
The DivMMC EnJOY! PRO MINI lite with ESXDOS supports .TAP, .SNA, .Z80 and .SCR files, and there is limited support for .TRD files.

The .TZX file format is not supported; this file format contains exotic loading systems (speed loaders, loaders with copy protections, etc.) which need a lot of CPU power to decode.

There is a limitation in snapshot files (.Z80 and .SNA): 128K snapshot files will often only work on the ZX Spectrum 128K ('toastrack') but not on the ZX Spectrum +2A, +2B and +3 because of ROM incompatibility.

ESXDOS 0.8.6

Welcome to ESXDOS, the most advanced firmware for mass storage interfaces for the ZX Spectrum! ESXDOS is still continuously in development, thus being a future-safe choice for your ZX Spectrum interface.

Main ESXDOS 0.8.6 features
- New BASIC and many new "DOT" commands
- Autoboot-support
- Limited 128/+3 BASIC support with the '.128' command
- Betadisk/TR-DOS emulation using .TRD files
- TAPE emulation: reading and writing .TAP files
- NMI Browser: pressing H in the NMI Browser brings up onscreen help
- Directory support in every command

Currently unsupported features / known bugs
- No long file names
- No wildcards in BASIC commands

Cold start
To perform a cold start without powering off your ZX Spectrum, press the reset-button and hold the SPACE key while resetting.
This will reinitialize ESXDOS.

Using drive names
Drives are named according to their type and partition number: sd0 for the first SD card.
Using '*' in commands will point to the SD card currently in use.

You can see a list of drive names when ESXDOS runs its initial BIOS drive detection (on a cold start).

Using directory names
You can use the name of directories in all commands, and use '/' at the start of the directory to point to the root of the SD card.

For example:
LOAD *"/sys/AUTOBOOT.BAS" – this loads AUTOBOOT.BAS from whatever directory you are currently in.
.cd /sys/config – this will set the current directory tot /SYS/CONFIG

New BASIC commands
On all BASIC commands that use a drive parameter, you can use * for the current drive.
[…] means it's an optional parameters.

GOTO [drive] ["path"]
  Example:
  GOTO hd0"demos"
  This will change the current drive and directory to hd0:/demos.
  You can use it to change the current drive, dir, or both.

CAT [drive]
      Example:
      CAT, CAT *, CAT hd1
      Without specifying a drive a fast CAT is done (no speccy header info is displayed).

LOAD drive "path/filename" [CODE]|[SCREEN$]
      Example:
      LOAD *"/test/blabla", etc

SAVE drive "path/filename" [LINE]|[CODE]|[SCREEN$]
      Example:
      SAVE *"filename" SCREEN$, etc

ERASE [drive] "path/filename"
      Example:
      ERASE *"filename", etc

DOT commands
Files located in the /BIN directory are so-called DOT commands.
These system commands can be executed from BASIC by typing: ".[command] <args>".

DOT commands are self-explanatory: enter one without arguments to get more information.
An example, entering: .tapeout
Will show:
      tapeOUT v0.1 (c) phoenix
      Usage: tapeout [args] [tapfile]
      -c: Close file
      -o: Overwrite file

For developers: each DOT command has 7.5K of RAM available and may call any ESXDOS syscall.
Commands can also exit to BASIC with a custom error message.

.ls	.mv oldname newname	Other commands in ESXDOS:
Show directory listing	Rename/move file/dir	.vdisk
		.playwav
.cd somedir	.cp source target	.dskprobe
Change directory	Copy file	.snapload
		.gramon
.tapein somefile.tap	.more textfile	.speakcz
Attach .tap file for reading	Display the contents of a textfile	.playtfm
		.playpt3
.tapeout somefile.tap		.ls
Attach .tap file for writing		.tapein
		.tapeout
.chmod +h somefile.sys		.partinfo
Set/unset attributes on file/dir		.launcher
		.rm
.mkdir newdir		.hexview
Create a new directory		.drives
		.mktrd
		.128

TR-DOS emulator

Either use the NMI browser to attach/auto-LOAD .TRDs, or use the .vdisk command:

.vdisk unit <filename>

Unit 0 = Drive A, Unit 1 = Drive B, etc.

If you specify just the unit, it will eject the virtual drive.

You can use .dskprobe to check the contents of the vdisk.

NMI Browser

Pressing the NMI button will bring up the NMI Browser.

From that menu the following keyboard shortcuts can be used.

Up, Down

Move cursor on page

Left, Right

Change page

Enter

RUN selected file (if supported)

r

Reset(Warm)

s

Create snapshot (auto incrementing name starting with snap0000.sna on initialisation of ESXDOS).

If you get ERROR 18 it's because file already exists, try again.

1

Go to parent directory (chdir to '..')

v

Show screen from .scr and .sna files (or files with ZX header of type 'CODE')

i

Attach tape file to input slot

Space

Exit from NMI mode

H

Onscreen help

WEBSHOP

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ByteDelight.com   BYTEDELIGHT   **ZXSpectrum.shop**