
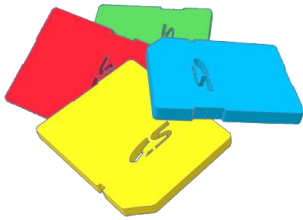


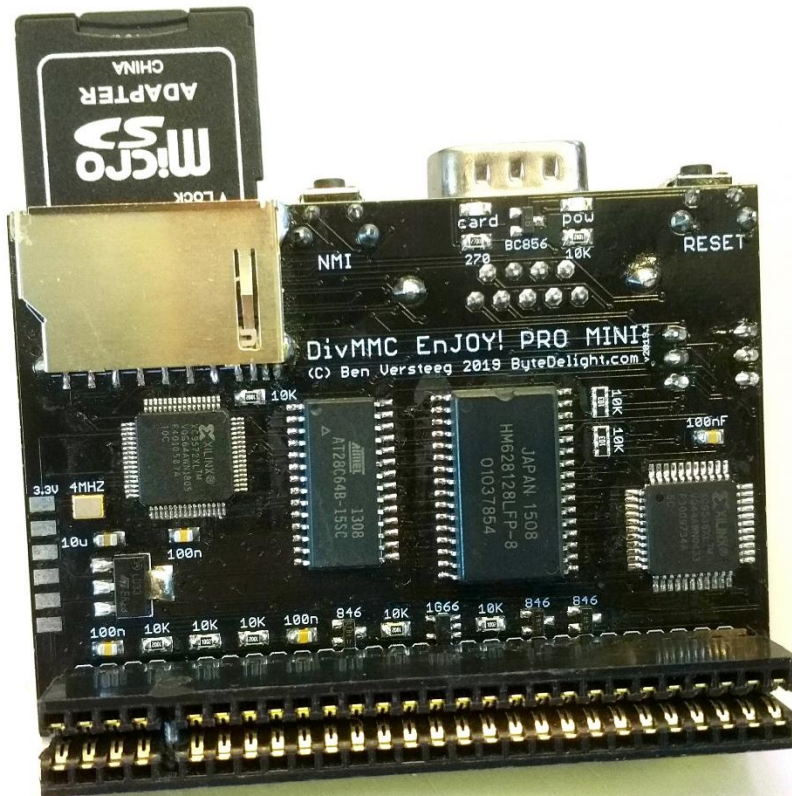
The

# DivMMC EnJOY! PRO MINI

with  0.8.7



*SD card and joystick interface  
for the Sinclair ZX Spectrum*



*Configurable  
joystick port*

*Auto detection  
of ZX Spectrum  
model*

***Power off your ZX Spectrum before connecting this interface***

***No need to read the rest of this manual before using  
the DivMMC EnJOY! PRO MINI, just plug and play!***

Manufactured by Ben Versteeg

**BYTEDELIGHT**

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## Overview

With the DivMMC EnJOY! PRO MINI you can load software from SD card to your ZX Spectrum easily!

The DivMMC EnJOY! PRO MINI has a configurable joystick port, a full-size SD card slot, and advanced auto detection features to make it plug-and-play.

There is an NMI button for an easy NMI Browser menu with lots of functions, and there is a reset button.

The DivMMC EnJOY! PRO MINI comes with ESXDOS, which is FAT and FAT32 compatible, 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](http://www.worldofspectrum.org) for many ZX Spectrum titles.

You can also load and save separate files directly from and to the SD card!

## Compatibility

The DivMMC EnJOY! PRO MINI has been successfully tested with:

- ZX Spectrum 16K board issues 1 and 2
- ZX Spectrum 48K all board issues
- ZX Spectrum 48K Plus all board issues
- ZX Spectrum 128K all board issues
- ZX Spectrum +2
- ZX Spectrum +2A
- ZX Spectrum +2B
- ZX Spectrum +3
- ZX Spectrum +3 with +3e ROMs
- Investronica ZX Spectrum 48K Plus\*
- Investronica ZX Spectrum 128K
- Harlequin 48K rev.G
- Harlequin 48K rev.H
- Sparrow Lite rev.3 with Nebula
- ZX-HD HDMI interface
- ZX-AY external stereo sound interface
- Kempston Mouse Turbo 2017 interface

\*The Investronica ZX Spectrum 48K Plus has an integrated joystick interface that conflicts with the Kempston mode on the PRO MINI. When using this ZX Spectrum model, select another joystick interface on the PRO MINI. Find out more in the Joystick interface paragraph.

## In the box

Your DivMMC EnJOY! PRO MINI interface is delivered with an SD card and this manual.

The card is formatted and contains some ZX Spectrum games and demos for you to try instantly when you install your DivMMC EnJOY! PRO MINI for the first time, without having to download software first.

## Notification LEDs

The DivMMC EnJOY! PRO MINI has two notification LEDs.

The (green) 'POWER' LED indicates the ZX Spectrum with DivMMC EnJOY! PRO MINI is powered on. And the (blue) 'CARD' LED shows the SD card activity.

## ***Make sure the ZX Spectrum's edge connector is clean***

It's important that your ZX Spectrum has a clean edge connector before connecting any interface. Advised is to use cotton swabs with >95% pure (e.g. isopropyl/IPA) 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>.

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

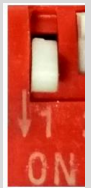
## Joystick interface configuration

The DivMMC EnJOY! PRO MINI has a configurable joystick port.

By default this is set to Kempston joystick.

DIP switch		
2	3	JOYSTICK TYPE:
ON	ON	KEMPSTON JOYSTICK
ON	OFF	SINCLAIR2 JOYSTICK
OFF	ON	CURSOR JOYSTICK
OFF	OFF	JOYSTICK INTERFACE DISABLED

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



The ZX Spectrum +2, +2A, +2B or +3 have Sinclair1 and Sinclair2 ports already integrated.

For any of these ZX Spectrum models you can select Kempston joystick on the DivMMC EnJOY! PRO MINI.

Selecting Sinclair2 or Cursor joystick on the DivMMC EnJOY! PRO MINI would normally conflict with the integrated joystick ports on these ZX Spectrum models, but the Auto-Detection feature of the DivMMC EnJOY! PRO MINI will prevent that: it will disable the joystick interface on the DivMMC EnJOY! PRO MINI if a conflicting configuration is selected.

# Connecting the DivMMC EnJOY! PRO MINI

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

When powered off, connect the DivMMC EnJOY! PRO MINI 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 connected

This DivMMC EnJOY! PRO MINI interface comes with ESXDOS.

Once you power on your DivMMC EnJOY! PRO MINI, 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](http://troubleshoot.bytedelight.com).



### Introduction

After the ZX Spectrum with DivMMC EnJOY! PRO MINI had finished the boot sequence, the introduction application will load automatically.

You may end this pressing S, or pressing D to disable it with the next boot.

### USR 0 Mode

After the ZX Spectrum with DivMMC EnJOY! PRO MINI had finished the boot sequence, you will enter 48K BASIC in USR 0 mode.

For ZX Spectrum 128K / +2 / +2A / +2B or +3 users: the DivMMC EnJOY! PRO MINI starts the ZX Spectrum in USR 0 mode. This mode supports 128K software and using the 3-channel audio chip in 128K models.

128K programs will however run fine.

# Using the DivMMC EnJOY! PRO MINI

## 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 and pull the SD card from the DivMMC EnJOY! PRO MINI.

Put the SD card into a card reader on your PC or laptop and you are able to copy files to the SD card.

Visit [www.worldofspectrum.org](http://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 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 ('toast rack') but not on the ZX Spectrum +2A, +2B and +3 because of ROM incompatibility.

# ESXDOS 0.8.7

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.

## New ESXDOS 0.8.7 features

- Bugfixes
- New/Updated Commands: .dfwload, .more, .dumpmem and .sercp

## New ESXDOS 0.8.6 features

- New BASIC and many new "DOT" commands
- Autoboot-support

## 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 to /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 parameter.

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/bla", 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 the command 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  
Show directory listing

.tapeout somefile.tap  
Attach .tap file for writing

.mv oldname newname  
Rename/move file/dir

.cd somedir  
Change directory

.chmod +h somefile.sys  
Set/unset attributes on file/dir

.cp source target  
Copy file

.tapein somefile.tap  
Attach .tap file for reading

.mkdir newdir  
Create a new directory

.more textfile  
Display the contents of a textfile

New commands in ESXDOS 0.8.5:

```
.vdisk      .gramon  
.playwav    .speakcz  
.dskprobe  
.snapload
```

New commands in ESXDOS 0.8.6:

```
.playtfm    .launcher  
.playpt3    .rm  
.ls          .hexview  
.tapein     .drives  
.tapeout    .mktrd  
.partinfo   .128
```

New commands in ESXDOS 0.8.7:

```
.dfwload  
.more  
.dumpmem  
.sercp
```

## 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 .diskprobe 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

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