

**FM**

<b>COLLABORATORS</b>
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# Chapter 1

## FM

### 1.1 main

FMBaseConfig, FMTV, FMRecorder, FMRecord, FMRecordDec, FMGrab, ↔  
FMInit

a new driver system for the electronic-design  
FrameMachine video card

Introduction  
What is it?

Requirements  
Hard-/Software-Requirements

OCS, ECS, AGA  
Read this, if you have no Gfx-Board!

Installation  
How to install...

FMBaseConfig  
FrameMachine Settings

FMTV & Grabbing Center  
Watch TV and grab pictures on your WB!

FMRecorder  
Record anims to HardDrive!

---

FMInit  
Initializes the FM

FMGrab  
Grabs images (Shell)

FMRecord  
Records anims to HD (Shell)

FMRecordDec  
Converts FMMovie-Anims into images

Speed  
How fast is it?

Bugs, Limitations  
Known problems...

History  
Program history

Credits  
Thanks to...

Registration  
GIFTWARE

Disclaimer  
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Author  
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## 1.2 Introduction - What is it?

Introduction  
-----

About a halve year ago I wanted to have a fame-grabber with good image-quality and the ability to grab a image in realtime out of

---

a running video.

First, I wanted to develop my own video-digitizer, but as I had not enough time, I decided to buy one. But I wanted to have a hardware with programmer docs, so that I can write my own software for and with it.

First, I wanted the VLab from MacroSystems, but MS didn't want to give me the needed programmer docs.

Then, I decided to choose the FrameMachine from electronic-design. This card is old, but has some nice features, one of them is the Prism24 video buffer.

The only problem of the FM is, that the original driver, the framemachine.library has several bugs which makes it almost impossible to use the card on new hardware, because it has timing-problems (I2C-Bus overclocked by software.) Because of this, I wanted to make my own drivers.

As I contacted ED, they told me, that they do not support the FrameMachine anymore, but they wanted to help me to get the needed docs... well, several phone calls and weeks later I spoke with the software developers of this card (D. Swertz and R. Steffen) and they both said Ok that I can have the sources of the original framemachine.library.

Well, some days after these phone calls I got the sources and started immediately to program a new driver.

The result is a not "framemachine.library"-compatible driver, this old library is in my opinion not very powerful.

I made a much more flexible C++ class which takes over control over the FrameMachine hardware.

Since version 1.25, the FMdriver package comes with my own proprietary newframemachine.library, this library is not for open use, only the FMdriver applications do have access to it.

If you want to use the FrameMachine from other applications, please use my FrameMachineVHI-driver (which also does use the newframemachine.library).

I removed the timing-problems of the original version in a system-friendly way and added also some features.

The result is a very stable and fast driver which should also run on the fastest machines.

I even made PPC-versions of the driver which allows to do the YUV-to-RGB conversion in pure realtime.

## 1.3 Requirements - Hard-/Software-Requirements

Requirements

-----

- \* FrameMachine video card, with or without Prism24 add-on
- \* AmigaOS3.x (tested with 3.9)
- \* About 2MB free RAM
- \* 68020(+)
- \* OCS, ECS or AGA (runs from 2 to 256 colors (!!))

> For full image quality and speed you should have running

> with CGX V3/V4 or Picasso96 in 15 Bit or more

Additionally you need for the PPC-Versions:

- \* a PPC 603e/604e PowerPC accelerator board
- \* WarpOS V3 or better

Testconfiguration

Amiga3000, OS3.9, PAL machine  
CyberStorm 604e/200 & 68040/40, 144MB RAM  
CyberVisionPPC, FrameMachine, AriadneII, HyperComZ3  
9.1GB and 4.5GB UW-SCSI-HD, Plextor UltraPlex32 CDROM,  
Yamaha CDRW 4x CD-Writer, SyQuest270

## 1.4 OCS, ECS, AGA - Read this, if you have no Gfx-Board!

OCS, ECS, AGA  
-----

The FMdriver applications since release 1.10 support all possible workbench-displaymodes, also OCS, ECS and AGA graphics.

But you should know, that there is a (major) loss of speed (of course also a major quality-loss!!), if you don't use a Gfx-Board because the software has to re-render the image to your Workbench palette for every frame.

The programs use a algorithm which searches for the closest matching of a color. If the palette changes during operation, it is possible, that the display gets silly. In this case, close and reopen the program. It then re-creates the colortables to provide optimum display-quality.

I have to admit that this is not a very fine way, but to reach maximum display speed on non-gfx-board systems, this was the best way.

## 1.5 Installation - How to install

Installation  
-----

Just double-click the "Install Software" icon and follow the installation steps displayed by the install-script.

--- Only if you want to do it by hand, do the following ---

---

(not recommended and needed)

1. Copy the two files  
"devs/XILINX"  
and  
"devs/XILINX.PRISMA"  
to DEVS:
2. Copy the "libs/wizard.library" and  
"libs/newframemachine.library" to libs:
3. Copy the documentation, catalogs and program files to  
a drawer were you want to have the software located.
4. Thats it!

## 1.6 FMBaseConfig - FrameMachine Settings

FMBaseConfig

-----  
FMBaseConfig is the global configuration program for the new  
FrameMachine driver. If you start it, there will open a window  
with a lot of sliders in it.

If you are a NTSC-user, I think you have to do some  
adjustments to have a perfect picture, I had unfortunately no  
possibility to do this on my own.

So if you have better settings, please send them to  
me

.

Active Configuration

FMBaseConfig/FMdriver can store and handle several different configurations  
for you. The "Active Configuration" is the configurations you edit.  
You can rename it by entering a new name in the input gadget below the cycle  
gadget. The other buttons are self-explanory, I think.  
Configurations are very nice if you want to have several settings for example  
for digitizing 16:9 and 4:3 video or from several different video sources.  
Everytime you can have other image border settings so that you don't see any  
black borders; this also speeds up digitizing! ;-)

The page "Prism24 Window"

-----  
This page allows you to control all parameters like dimensions and  
position of the video image coming from the Prism24 video module.

(You should set the Mode (->"Prism24 Modes" to "Prism Key"  
to have all possibilities enabled!)

leftskip: how much should be cut of from the image on  
the left side (black-border removal)

---



rightskip: like leftskip, but for the right side of the image

topskip: how many image-lines shall be skipped on the top  
of the image (video-text-border removal)

x1: start-X-position of the image displayed by Prism24  
x2: end-X-position of the image

y1: start-Y-position  
y2: stop-Y-position

(x2 - x1) has to be the width of the display!!

for example: DisplaySize: 720x570 -> width=720  
if x1 is 122 then x2 has to be 842:  
width=x2-x1 -> x2=width-x1 -> 842=720-122

xoffset: X-position of the image  
yoffset: Y-position of the image

=> You should always set xoffset and yoffset to zero and  
adjust every DisplaySize so that it is exactly centered  
on the screen.

The xoffset and yoffset controls the offset from the  
centered position. This can be directly be influenced  
by an application using this new driver.

The page "Prism24 Image"

-----  
The sliders available in this section control the output' image  
of Prism24. You can change brightness, saturation, contrast, red,  
green and blue.

Change the sliders until it best fits your equipment and save it.  
These settings will be used as default by other applications.

The page "Prism24 Modes"

-----  
The gadgets on this page let you set the display mode and keymode  
for this configuration.

The page "Digitizer Border"

-----  
Every setting on this page directly influences the digitized  
images by the FrameMachine driver.

You can specify leftskip, rightskip, topskip and height of  
the image.

These changes are useful to avoid black borders or the upper  
video-text lines.

If you are on this page, on the right-side of this window opens  
a real-time preview of the settings.

---

Change the settings for every DisplaySize, so that the applications using the new driver have the best image without any irritating borders.

The page "Digitizer Image"

-----

The settings on this page influence the image parameters like brightness, gamma, contrast, etc.  
The settings are saved for the current active configuration.

If you have finished all adjustments, just close the program or create a further configuration.  
The settings for Size, Input Type, Video Input and Video Format by the way are also saved in the current configuration; they will be used as default in all applications using it.

Now you are ready to use this FrameMachine driver package!

## 1.7 FMTV & Grabbing Center - Watch TV and grab pictures on your WB!

FMTV

----

The FMTV program is for watching TV in a small window on your Workbench and for grabbing images.

If you click on the tv-window with the left mouse button, the image is paused.  
A right click on this window opens the TVControl-window, if you click again with the right button, the TVControl-window is closed.

In the TVControl window you have several options to adjust the displayed image to your needs.

The gadgets:

- Interlaced:
- o No Lace:
    - Only the halve-frames are digitized and displayed (full image width, but halve image height)
  - o NoLace Scaled:
    - Only the halve-frames are digitized but to have full image-height the image is doubled in height using the GFX-card drivers function ScalePixelArray().
  - o Interlaced:
    - The full image (combined halve frames) is digitized. This is the best image-quality but slower because the hardware has to transfer more data.

Size: Here you can specify how big you want to have the

---

video picture on the WB and on the Prism24.

- Display:
- o Window:  
The image is displayed only in a window on the WB.
  - o Window&Prism24:  
The image is both displayed on the WB and on Prism24.  
Restriction: flickering display on Prism24 because FrameMachine has to transmit the image-data.
  - o Prism24:  
The image is displayed only on the Prism24, the WB-TV-window closes automatically.

Mode: (only of use when using Display: Window)  
Here you can specify if you want a color or grayscale image in the TV-window.

FPS Counter: If this checkbox is checked, a small FPS-counter is activated which shows the frames-per-second.  
(only available if DisplayMode is "Window")

Video Input:

- o CVBS: the cinch (FBAS, VHS) input is used
- o Y/C: the Mini-DIN (SVHS) input is used

Input Type:

- o Video: video as source, very stable image (TBC)
- o TV: high-quality source, unstable if bad image

Video Format: PAL, NTSC -> specifies the type of the input video format

Configuration: This is the currently used configuration created with  
  
FMBaseConfig  
- the stored settings  
are temporarily overwritten by the gadgets above.

Corrections: These sliders control the brightness, gamma, contrast, red green and blue levels of the images taken from the FrameMachine. Negative makes a negative image effect.  
If you want to get maximum speed, set all sliders to zero and deactivate the negative-checkbox.

#### FMTV's Grabbing Center

-----

This window is available over the prefswindow's and tvwindow's menu.  
The Grabbing Center is a nice sub-tool of FMTV which lets you easily grab and save images from the running video. You even don't need to have the TV-window opened when grabbing images. This is helpful when you want to grab full-sized images, the system performance really goes remarkable down as it has to handle much image data for each frame.

The gadgets: (from left to right)

Grab: Grabs (takes) an image and saves it into the image list.

Select All: Selects all images in the image list.

Deselect All: Deselects every image in the image list.

Toggle Selection: Selects unselected and deselects selected images. The selection state is toggled.

DeInterlace: Add two more pictures to the image list. The first one is halve-frame A and the second halve frame B of the selected image.

DeInterlace & Double: Same as "DeInterlace", but the halve-frames get vertically doubled (with a filter algorithm) to get the correct aspect-ratio, again.

Delete: Delete all selected images.

Save: Saves all selected images with the path and image base-name entered in the Imagebasename-input the gadgets.

Prefs: Opens the  
FMTV  
-Prefs window.

## 1.8 FMRecorder - Record anims to HardDrive!

FMRecorder

-----

FMRecorder is for digitizing movies to harddisk. The anims are stored in the FMMovie fileformat, this a proprietary fileformat and only used in the FMdriver applications for saving the FrameMachine video streams in the fastest possible way. You have the possibility to playback the recorded anims with a built-in player and can convert the anims into single images for using them in other video applications (like MPEG video encoders).

If you run FMRecorder, the GUI provides the following options:

On the bottom of the window:

FMMovie-Anim: Specify here the filename for the FMMovie animation to record. (the file-button on the right side opens a filerequester)

Section "Record/Play Anim":

Record Anim: Starts the recording of the anim

Stop: Stops recording (FMRecorder automatically stops, if the harddrive is full...) :)

Pause: Pauses anim playback; lets you also use the slider above to

Play Anim: Plays a recorded animation. The movie is always played once.

Mode: This cycle-gadget let you switch between full speed and time lapse-recordings. In the case of time-lapse, you have also to enter the number of seconds between each frame is taken.

#### Section "Convert Anim":

If you click Start Conversion, FMRecorder will start to convert the anim into single frames. The fileformat can be chosen by the Output Format cycle-gadget on the top of the window.

Currently there is support for the following filetypes:

- o PPM (24Bit color)
- o PGM (8Bit grayscale)
- o IFF24 (24Bit color)
- o IFF8 (8Bit grayscale)
- o IFF24c (24Bit compressed)
- o IFF8c (8Bit compressed)

Filename style: Here you can specify how the saved images are named. Just look at the labels of this cycle gadget and choose the name style you want to have. The labels are an example for image number 12.

You have to specify the basename of the saved images in the Output text input gadget (the button on the right side opens a filerequester).

#### Section "Image Settings":

See

FMTV's Prefs Window  
for more information.

Example You want to create a MPEG movie out of your recorded anim:

1. Select a basename for your images (for example: "dh2:images/Pic")
2. Select the Output Format "PPM"
3. Select the Filename style "Pic0012.ppm"
4. Now click "Start Conversion" and wait until all images are converted
5. Load a MPEG video encoder and let it convert the images.

As example, CreateMPEG from Phase5 (PPC: runs great with Frank Willes ppplibemu): (opened GUI from CreateMPEG)

---

```
Source: dh2:images/Pic.%04ld
Target: dhe:movie.mpg
Format: PPM
Frames: (your frame number)
1st frame: 0
```

Now click "Start" and after a while, the mpeg movie should be successfully generated.

Thats it!! ;)

## 1.9 FMInit - Initializes the FM

```
FMInit
-----
```

FMInit is a small tool which allows to initialize the FrameMachine to user-selectable settings. You can run it from WB using Tooltypes and also from shell.

I recommend to copy FMInit in your WBStartup drawer of your System to have after every reboot a perfect configured FrameMachine. This is especially useful, if you have a video monitor connected to the Prism24 output and watch often TV over it.

The following tooltypes/arguments are supported:

CONFIG: Name of the FMdriver configuration to use

MODE: Specifies the DisplayMode of Prism24:

- o AMIGA (Amiga only display)
- o PRISM (Prism24 only display)
- o PRISMKEY (Genlock mode Prism24 and Amiga)

SIZE: Specifies the display size of Prism24:

- o 720 (full image)
- o 360
- o 240
- o 180
- o 120
- o 90

KEYMODE: Specifies the Keymode of Prism24, if MODE=PRISMKEY is activated. For a complete description of the keymodes, please read the FrameMachine docs.

TYPE: Specifies the video input type

- o VCR (more stable image, should be your default)
- o TV

INPUT: Specifies which video input of the FrameMachine is used:

- o FBAS the cinch input

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- o CVBS (like FBAS)
- o SVHS the mini-din input
- o YC (like SVHS)

FORMAT: Specifies which video type you have on your input.

- o PAL
- o NTSC

## 1.10 FMGrab - Grabs images (Shell)

FMGrab

-----

FMGrab is a small shell tool which allows to grab single images from the video input and save them to a file. The program is very useful if you want to make a WEBCam with your FrameMachine... ;)

Usage: FMGrab FILENAME/M, FILETYPE/K, CONFIG/K, SIZE/N, NOLACE/S, TYPE/K, INPUT/K, ←  
FORMAT/K

FILENAME: Name of the PPM/PGM file to save

FILETYPE: PPM, PGM, (IFF24), IFF8, IFF24c, IFF8c

CONFIG: Name of the FMdriver configuration to use

SIZE: (720), 360, 240, 180, 120 or 90

NOLACE: (switch)

GRAYSCALE: (switch)

TYPE: TV or (VCR)

INPUT: (FBAS,CVBS) / SVHS,YC

FORMAT: (PAL) or NTSC

default-values: last used FMdriver configuration + IFF24

Example:

You want to grab a image from your SVHS (YC) input in the size 360x285 to the compressed iff8-file "dh2:image.iff":

```
fmgrab filetype=iff8c size=360 input=svhs dh2:image.ppm
```

## 1.11 FMRecord - Records anims to HD (Shell)

FMRecord

-----

FMRecord is a small shell tool which allows to record FMMovie anims to your harddrive.

Normally you will use

```
    FMRecorder
    , the Workbench version of this.
```

```
Usage: FMRecord FILEMAME/M,CONFIG/K,FRAMES/N,SIZE/N,NOLACE/S,
        TYPE/K,INPUT/K,FORMAT/K
```

FILENAME: Name of the PPM/PGM file to save

CONFIG: Name of the FMdriver configuration to use

FRAMES: How many frames to record

SIZE: (720), 360, 240, 180, 120 or 90

NOLACE: (switch)

TYPE: TV or (VCR)

INPUT: (FBAS,CVBS) / SVHS,YC

FORMAT: (PAL) or NTSC

default-values: last used FMdriver configuration + IFF24

Example:

You want to record 77 images to a FMMovie anim "dh2:anim.fmm" from your SVHS (YC) input in the size 360x285:

```
fmrecord size=360 frames=77 input=svhs dh2:anim.fmm
```

## 1.12 FMRecordDec - Converts FMMovie-Anims into images

```
FMRecordDec
```

FMRecordDec is a small shell tool which allows to convert FMMovie anims to single images.

Normally you will use

```
    FMRecorder
    , the Workbench version of this.
```

```
Usage: FMRecordDec FMFILE BASENAME/M/A,PGM/S
```

FMFILE: name of the FMMovie-file

BASENAME: base-filename of the PPM-pictures to save

FILETYPE: PPM, PGM, (IFF24), IFF8, IFF24c, IFF8c

---



(values in brackets are the default-values)

Example:

You want to decode the anim "dh2:anim.fmm" to single PPM images "dh2:images/Pic.0000", "dh2:images/Pic.0001"...

```
fmrecorddec filetype=ppm dh2:anim.fmm dh2:images/Pic.
```

## 1.13 Speed - How fast is it?

Speed

-----

The speed is very dependant from bus-transfer-rate to the Gfx-board (mine is an CyberVisionPPC) and from the speed of the used display-driver.

All values are FPS (frames per second).

PPC-Version, using CyberStormPPC, 604e/200 and 68040/40MHz

	Interlaced		NoLace-Scaled		NoLace	
Resolution	Color	Gray	Color	Gray	Color	Gray
720x570	1.1	1.3	1.6	1.4	1.9	2.3
360x285	4.8	6.7	5.0	4.2	5.4	6.2
240x192	10.4	13.5	8.3	6.3	8.3	8.3
180x144	16.7	25.0	8.3	10.9	8.6	8.3
120x 96	25.0	25.0	12.5	12.5	12.5	12.5
88x 70	25.0	25.0	12.5	12.5	12.5	12.5

As you can see is the 240x192 in the NoLaceScaled and Interlaced modes suitable for watching TV on the Workbench.

I think the speed should be much higher on a system equipped with an 68060 and a better Gfx-board on-board...

The reason for the "slow" 12.5 FPS values in small resolutions is, that the FrameMachine uses double buffered recording, which speeds up a lot. But if a frame is dropped, you immediately also only have the half framerate. But I think this is not very important, though.

The interlaced modes are usually much faster as the FrameMachine has the optimal double buffer design for capturing interlaced video.

I  
would be glad to get your speed results... :)

## 1.14 Bugs, Limitations - known problems

Bugs, limitations or known problems

---

The FrameMachine driver should work on any system.  
The only problem which could exist is, that the settings  
for NTSC modes and NTSC machines could not be correct.

So if you encounter display problems, the solution is not  
very problematic:

Just run FMBaseConfig and change the settings until the  
displayed picture is Ok. Then just click "Save" and your  
settings will then be used in future.

What to change, is described  
here

.  
If you have adjusted your hardware, please send the  
DEVS: FrameMachine.settings to

me  
, so that

I can include these settings in the next release.

What is impossible with this version is to upload an image  
to the Prism24 hardware. If you want to have this feature,  
please contact

me  
.

## 1.15 History - Program history

History

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V1.00: (15.08.1999)

\*\* first public release \*\*

V1.01 (20.08.1999)

- fixed a small bug in the install-script

V1.10 (29.08.1999)

\*\* 2. public release \*\*

- added global support for non-gfx-board Amigas (!!)  
- added the programs FMInit, FMGrab, FMRecord,  
FMRecordDec and FMRecorder

V1.12 (01.09.1999)

\*\* 3. public release \*\*

---

- added the gadget "Filename style" to FMRecorder for more filename styles  
Thanks Lemmink, for this idea!
- added a status requester (frames/fps) to FMRecorder for playback and recording
- FMTV now closes the TVControl window, if you close with the right mouse button into the TV window
- removed a "flicker-problem" in small resolutions (this caused also strange lines on some machines)  
Thanks to Rolf Wiessner and Ingo Nehls for reporting this problem!
- added global support for the following image filetypes: PPM, PGM, IFF24, IFF8, IFF24c, IFF8c
- The FMdriver was unable to work without a attached Prism24 board... sorry, hadn't tested this until Gernod Schomberg reported this... Thanks Gernod!!

## V.13 (16.01.2000)

- added the option "NoBorder" to FMTV to have only the TV-picture on the WB
- added menus to FMTV
- introduced the double buffer mode of the FrameMachine (brings \*major\* speed increases!!)
- added Brightness, Contrast, Gamma, Red, Green, Blue correction functions to FMTV
- added the "GrabbingCenter" to FMTV! Now there it is really easy to grab images out of videos!
- added a lot of shortcuts to FMTV
- FMRecorder now has anim-controls (pause, seek, ...) to have much better access to the recorded video
- FMRecorder profits of the double buffer mode of the FrameMachine very much, too!

## V1.14B (21.12.2000)

- \*\* 4. public release \*\*
- made some smaller fixes over a long time period
- now, my FrameMachine driver resides in a new library "newframemachine.library". Now there is no more need to use different versions for 68k and PPC!

## V1.25 (07.04.2001)

- \*\* 5. public release \*\*
- => changed `_a_ _lot_`, so perhaps I forgot something to mention here:
- cleaned up the newframemachine.library a bit
- added a new feature: configurations, now you can save and recall several different configurations you can create with FMBaseConfig; added this feature to all FMdriver applications
- the driver now always uses the last used config as default
- FMBaseConfig is now localized
- changed the structure of FMBaseConfig to have all the new possibilities which became available with configurations enabled
- the video-window of FMBaseConfig and FMRecorder always snaps to the right border of the main window
- FMTV now is able to grab a picture from the tvwindow, prefswindow and grabcenterwindow just by pressing <SPACE>  
Thanks to Rolf Wiessner for this idea!

- fixed an enforcer hit of FMTV
- FMTV didn't use the filename for the image basename specified by the filerequester in the grabbing center. fixed.  
Thanks again, Rolf!
- from now on, every application in FMdriver will have the same version number; this will help to ensure what version is installed...
- updated the complete guide documentation so that the new features are also covered... hmm... writing documentation really needs \*very\* much time... :(
- FMRecorder is now also able to make time-lapse animations
- almost rewrote the documentations

## 1.16 Credits - Thank you

Thanks to:

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- electronic-design for the support
- Daniel Swertz and Rainer Steffen for providing the sources
- Gerd Frank for providing the hardware and good ideas
- Haage&Partner for StormC and WarpOS
- phase5 for producing the PowerPC-Boards and the CyberVision64/CyberVisionPPC

## 1.17 Registration - GIFTWARE

Registration

-----

The new FrameMachine drivers are GIFTWARE.

If you use this software and want me to make further updates, I would recommend, that you send me a donation of your choice (money or other useful things like hardware, etc.).

You can reach me  
here

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## 1.18 Disclaimer - Warranty

Disclaimer

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No warranty, either express or implied, is made with respect to the fitness or merchantability of this software.

The FrameMachine driver and the programs using it were tested intensively and there was no problem encountered using it.

The software should also run on your system.

But I'm not responsible for any damage which could be - directly or indirectly - caused by using it.

The user of this software use it at his or her own risk!

## 1.19 Author - contact information

Author

-----

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Improvements, bugreports, suggestions etc. are welcome.

The FMdriver package is GIFTWARE!

If you like my work, I would be very happy to receive a donation of your choice from you!

Please also read the page  
Registration

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And don't forget to visit my homepage: <http://www.qdev.de>

You can get there the latest updates, additional information and

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