



Software-Manual  
english version

- EVPC 0.11
- EVPCDSR 4.15



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### **Configuration-program**

The EVPC – Configuration-program now supports the following features: modification of NOVRAM-contents, save configuration to disk or load from disk and write to the volatile-RAM-area of the NOVRAM. There is also a status report and a defined default-setting implemented.

The program is handled by the well known hot-key-access, as introduced with the Memory-Manager 3.0. You have online-support via a status-line and you are shown all available commands with the „AID“ command (FCTN-7). „Dangerous“ commands must be confirmed by the user.

#### **Main Screen:**

From the main screen all sub-menus can be selected. It is the start and the end of the program.

#### **Disketten-Operationen (Disk-Operations)**

Configurations can be saved to or loaded from disk in this sub-menu.

#### **Konfiguration (Configuration)**

Several modifications of your card can be done here. i.e. VDP-RAM-shift, Videosystem, screen-position. The values selected here will be used by the next power-up (Quit) until a hardware reset occurs.

#### **Information**

Information about your EVPC are available here, i.e. the current status of your DIP-switch, your color-palette or your Video-processor. A small memory-test is also done, to allow a calculation of the Video-RAM installed.

#### **Grundeinstellung (Default-Setting)**

If selected, all settings in your NOVRAM will be initialized with their default values. Will affect the volatile RAM-part only, with no automatic saving!

#### **Sichern (Save)**

This function will save the contents of the volatile RAM to its EEPROM-mirror. A checksum is also calculated and saved to allow proper function of the validation.

Because the NOVRAM allows approx. 10.000 erase cycles, a counter is always incremented on every save-function, which shows the actual count of cycles. NOTE: All modifications done without saving are not limited, because only the volatile RAM-area is affected!

## DSR 4.0

### The DIP-switches

#### DIP-SW 1: Videomode PAL / NTSC

This switch selects the video-mode each time the card is powered-up. You may test if your monitor has a better resolution with NTSC or PAL. Please note: in NTSC-mode the video-interrupt is affected too, so it is 60Hz instead of 50Hz, interrupt-controlled sound-routines will run faster and interrupt-driven timing-loops may have wrong results ( i.e. the calculation routine for the actual crystal-frequency in „Memory-Manager 3.0“ and supplementary-program MM-EPROG)

- off: Videomode PAL
- on: Videomode NTSC

#### DIP-SW 2:

currently not used

#### DIP-SW 3: german character-set

For extended graphic-modes (i.e. TEXT 80) an expanded character-set will be used, which includes graphic-symbols and special characters.

- off: International Standard-character-set
- on: International character-set plus german special chars

#### DIP-SW 4: VDP-RAM-shift

If enabled, the Disk-access-blocks inside the VDP-RAM are shifted two bytes towards, to prevent the address counter from switching to the next RAM-bank. This may be necessary if the „new“ modes from the V9938 are used. In these modes the „filename-compare-buffer“ is used, which resides on the top of the VDP-RAM. Because of the intelligent memory-management after address >3FFF the internal address-counter will roll-over to >4000 instead of >0000 when you use a TMS9929. Because this new address resides in the next bank (1 instead of 0), your computer will lock-up. But this shift back will prevent the counter from rolling-over, because the last address used is now >3FFD.

A detection whether this shift is used is possible by simply looking into the PAD-RAM. The address >8370 shows the last free byte inside the VDP. Normally this is >37D7, if shifted it will be >37D5.

- off: VDP-RAM-shift enabled
- on: no shift

#### DIP-SW 5:

currently not used

#### DIP-SW 6:

currently not used

#### DIP-SW 7:

currently not used

#### DIP-SW 8: Configuration

This switch controls if the power-up-routine will use the configuration-data from NOVRAM or if the actual setting of the DIP-switches 1-7 is used.

If NOVRAM-data is set, the checksum of the NOVRAM is calculated. In case of an error the data from the DIP-switch is used, irrespective of the mode of the switch!

- off: Configuration using DIP-switches
- on: Configuration using NOVRAM

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### Link-table

In the new EVPC-DSR 4.0 a link-table is implemented in DSR-bank >0, starting at address >4010 to >401F. Using these pointers you can access various tables inside the DSR.

This became necessary, because future DSR-versions may use different addresses for the tables.

All tables can be found inside the bank, which is shown in the lowest-nibble of the pointer at >4010.

All currently unused addresses are set to >00. If the pointers are used bit-wise, please mask all unused bits off, because later versions may use the spare-bits.

address	contents	format
>4010	Nibble >0xxx - Bit 15 ... 12	currently not used
	Nibble >x0xx – Bit 11 ... 8	currently not used
	Nibble >xx0x – Bit 7 ... 4	currently not used
	Nibble >xxx0 – Bit 3 ... 0	DSR-Bank for characterdata, pointed at >4012 and >4014
>4012	Pointer to start of character-set-table	continuous character definition, 8 Byte per character each, start with character 0, end with character 255
>4014	Pointer to start of patch-table for german character-set	1 <sup>st</sup> word Pointer in VDP-Ram (using TEXT80) 2 <sup>nd</sup> to 9 <sup>th</sup> word character definition, end-of-table is >0000
>4016	currently not used	
>4018	currently not used	
>401A	currently not used	
>401C	currently not used	
>401E	Identifier >994A	Identifier for validation of link-table

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### Memory-map of NOVRAM

The NOVRAM is visible in the area >5F00 to >5FEF instead of the EPROM, if DEN (SBO 0) and RAMEN (SBO 3) are set. The NOVRAM is 4-bits-wide, so only the lower-nibble is valid. The upper-nibble must be masked out on read-accesses.

#### **Important notice!!**

The EVPC-program is in beta-test-phase, the map of NOVRAM and EPROM may be changed. Please contact us if you plan to use the contents with direct-access in your own programs.

Start	End	Size	Nibbles	Meaning / contents
>5F00	>5F01	8 Bit	2	screen-position
>5F02	>5F03	8 Bit	2	free
>5F04	>5F07	16 Bit	4	Bit 15: PAL / NTSC Bit 14: 192 / 212 rows Bit 13: non Interlace / Interlace Bit 12: VDP-RAM shift / non shift Bit 11: international character set / german character set Bit 10: Composite Video colour / black-white Bit 09 to Bit 00: free
>5F08	>5F0F	32 Bit	8	free
>5F10	>5F4F	256 Bit	64	Palette-colors R-B-G - V9938
>5F50	>5F9F	256 Bit	64	Palette-colors R-B-G – Extra-Palette
>5FA0	>5FD7	224 Bit	56	free
>5FD8		4 Bit	1	day of last saving – tens
>5FD9		4 Bit	1	day of last saving – ones
>5FDA		4 Bit	1	month of last saving – tens
>5FDB		4 Bit	1	month of last saving – ones
>5FDC		4 Bit	1	year of last saving – thousands
>5FDD		4 Bit	1	year of last saving – hundreds
>5FDE		4 Bit	1	year of last saving – tens
>5FDF		4 Bit	1	year of last saving – ones
>5FE0	>5FE3	16 Bit	4	saving-incrementer FEEPROM (0...65535)
>5FE4	>5FE7	16 Bit	4	checksum 1 of FEEPROM-contents (0...>FFFF)
>5FE8	>5FEB	16 Bit	4	checksum 2 of FEEPROM-contents (0...>FFFF)
>5FEC	>5FEF	16 Bit	4	Bit 15: 1=NOVRAM valid (in runtime-mode) Bit 14: 1=VDP contents shift by two (in runtime-mode)

### meaning of DIP-switches

DIP	CRU	TB	off (logical 1)	on (logical 0)
1	>1400	0	Videotiming PAL	Videotiming NTSC
2	>1402	1	free	free
3	>1404	2	Text80 normal character set	Text80 character set plus german special-characters
4	>1406	3	VDP-RAM – shift enabled	VDP-RAM – shift disabled
5	>1408	4	free	free
6	>140A	5	free	free
7	>140C	6	free	free
8	>140E	7	Power-up using DIP-switch-data and EPROM-defaults.	Power-up with NOVRAM-data, if checksum is valid. Otherwise DIP-switches are used.

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### CRU-Adresse-map

~~canceled names~~ inverted logic

CRU (R12)	MM30	Name	Equates	meaning
>1400	>0100	DEN	DSRENA	DSR Enable
>1402	>0200	PG0	DSRPG0	Eprom Pagebit 0
>1404	>0400	<del>ENGOL</del>	<del>DSRCOB</del>	<del>Enable Color Bus</del>
>1406	>0800	RAMEN	NOVENA	RAM Enable for NOVDRAM
>1408	>1000	PG2	DSRPG2	Eprom Pagebit 2
>140A	>2000	PG1	DSRPG1	Eprom Pagebit 1
>140C	>4000	STORE	<del>NOVSTO</del>	<del>Store NOVDRAM (SBO &amp; SBZ pulsing = save-puls)</del>
>140E	>8000	MUX	MUXPAL	VDP / Palette

### Memory-Mapping

Address	Meaning
>4000 to >5EFF	DSR-ROM (8-times banked with the 3 Pagebits)
>5F00 to >5FEF	NOVDRAM if RAMEN is set, otherwise DSR-ROM
>5FF0	Palette Read Address Register
>5FF2	Palette Read Color Value
>5FF4	Palette Read Pixel Mask
>5FF6	Palette Read Address Register for Color Value
>5FF8	Palette Write Address Register
>5FFA	Palette Write Color Value
>5FFC	Palette Write Pixel Mask
>5FFE	Palette Write Address Register for Color Value
>84xx	Write Sound Chip (WRITE-only on even Addresses)
>88xx	Read VDP (only READ on even addresses)
>8Cxx	Write VDP (WRITE only on even addresses)

### Pagebits for DSR-EPROM

The usable size of the DSR-ROM may be reduced. 16bits are always lost because these are used for palette registers, making the usable EPROM space >4000 to >5FEF. If CRU-Bit >1406 (RAMEN) is set, 256 Bytes at the top are lost, because the NOVDRAM is now mapped from >5F00 to >5FEF resulting in >4000 to >5EFF for the EPROM.

Bank	PG0	PG1	PG2	MM 3.0	Address in EPROM	used by
0	0	0	0	>0100	>0000 bis >1FFF	DSR
1	1	0	0	>0300	>2000 bis >3FFF	free
2	0	1	0	>2100	>4000 bis >5FFF	free
3	1	1	0	>2300	>6000 bis >7FFF	free
4	0	0	1	>1100	>8000 bis >9FFF	CALL GIF99 will copy to >A000 and start
5	1	0	1	>1300	>A000 bis >BFEF	CALL EVPC will copy to >A000
6	0	1	1	>3100	>C000 bis >DFEF	CALL EVPC will copy to >BFF0
7	1	1	1	>3300	>E000 bis >FFEF	CALL EVPC will copy to >DFE0 and start



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### contents of configurations-file

Data-Offset	Size (Bytes)	contents	used for
>00	>A (10)	>0 , >2000 , >2000 , BLWP , @0	EA5-Header
>0A	>8	Text: EVPC-CFG	Control of data
>12	>4	>DDMM,>YYYY	Date of last saving
>16	>2	>nnnn	16 Bit checksum, added without Carry
>18	>6C (108)		user-data >5F00 ... >5FD8 compressed
>84	>7C (124)		free

### Glossary

EPROM = Electrical Programmable Read Only Memory

EEPROM = Electrical Erasable PROM

NOVRAM = Non Volatile Random Access Memory

CRU = Command Register Unit (single bit I/O of TMS99xx series)

DSR = Device Service Routine (Operating System for Peripheral TI-cards)

VDP = Video Display Processor

EVPC = Enhanced Video Processor Card (a 80 column Display card of the system 99 user-group, also the name of this program)