

\$40	( read_n / write )	ID ID	\$08 \$D4	MSX2+ FS-A1 Series MSX++ 1chipMSX, Zemmix Neo, etc.	Z80B 5.37MHz OCM-PLD v2.4 or later
\$41	( read_n / write )	BIT 0		Smart Command ID	CPL or \$FF (Null)
		BIT 1			
		BIT 2			
		BIT 3			
		BIT 4			
		BIT 5			
		BIT 6			
\$42	( read / write_n )	BIT 7			
		BIT 0		CPU Clock	Virtual DIP-SW1
		BIT 1		Video Output (MSB)	Virtual DIP-SW2
		BIT 2		Video Output (LSB)	Virtual DIP-SW3
		BIT 3		Cartridge Slot-1	Virtual DIP-SW4
		BIT 4		Cartridge Slot-2 (MSB)	Virtual DIP-SW5
		BIT 5		Cartridge Slot-2 (LSB)	Virtual DIP-SW6
\$43	( read / write_n )	BIT 6		Current Mapper Size	Virtual DIP-SW7
		BIT 7		Current MegaSD Mode	Virtual DIP-SW8
		BIT 0		Lock Mask of the Toggles	CPU Clock
		BIT 1			Video Output
		BIT 2			Audio Mixer & SCRLK
		BIT 3			Cartridge Slot-1
		BIT 4			Cartridge Slot-2
\$44	( read / write_n )	BIT 5			Hard Reset Key
		BIT 6			Internal Mapper
		BIT 7			Internal MegaSD
		BIT 0		Lights I/O (SM-X and SX-2 only use Led 8 but this register works the same way)	Led 1 Status
		BIT 1			Led 2 Status
		BIT 2			Led 3 Status
		BIT 3			Led 4 Status
		BIT 4			Led 5 Status
\$45	( read / write_n )	BIT 5			Led 6 Status
		BIT 6			Led 7 Status
		BIT 7			Led 8 Status
\$46	( read / write_n )	BIT 0		PSG Volume Level	BIT 0 (LSB)
		BIT 1			BIT 1
		BIT 2			BIT 2 (MSB)
		BIT 3			Status
		BIT 4			BIT 0 (LSB)
		BIT 5			BIT 1
		BIT 6			BIT 2 (MSB)
\$47	( read only )	BIT 7			Status
		BIT 0		CPU Custom Speed Level	BIT 0 (LSB)
		BIT 1		Turbo MegaSD (tMSD) Turbo Pana Redirection (tPR) VDP Speed Mode Mapper Size Req MegaSD Mode Req	BIT 1
		BIT 2			BIT 2 (MSB)
		BIT 3			Status
		BIT 4			Status
		BIT 5			0=Normal, 1=Fast
\$48	( read only )	BIT 6			0=2048 KB, 1=4096 KB
		BIT 7			Status
		BIT 0		Turbo Pana	Status
		BIT 1		Current Keyboard Layout	0=JP, 1=Non-JP
		BIT 2		SCRLK Toggle	Status
		BIT 3		Lights Mode	0=Auto, 1=ON
		BIT 4		Red Mode (Led 0)	Status
\$49	( read only )	BIT 5		Last Reset Flag	0=Cold, 1=Warm
		BIT 6		Reset Required Flag	Status
		BIT 7		MegaSD Blink	Status
		BIT 0		Pseudo Stereo	Status
		BIT 1		External Clock Mode	0=Sync to CPU, 1=3.58MHz
		BIT 2		Machine Type ID	BIT 0 (LSB)
		BIT 3		(0=1chipMSX, 1=Zemmix Neo/SX-1 and related, 2=SM-X/MC2P, 3=SX-2, 4=SM-X Mini/SMX-HB, 5=DEOCV, 6-14=Free, 15=Unknown) NTSC/PAL Type	BIT 1
\$4A	( read only )	BIT 4		Forced Video Mode	BIT 2 (MSB)
		BIT 5		Right Inverse Audio	0=Forced, 1=Auto
		BIT 6		Pixel Ratio 1:1 for LED Display	0=60Hz (NTSC), 1=50Hz (PAL)
		BIT 7		Centering YJK Modes/R25 Mask	Status
		BIT 0		Assignment of Legacy Output	0=To VGA, 1=To VGA+
		BIT 1		Internal Slot-1 Linear	Status
		BIT 2		Internal Slot-2 Linear	Status
\$4B	( read only )	BIT 3		VGA Scanlines Level (ID*25%)	BIT 0 (LSB)
		BIT 4		Internal PSG2	BIT 1 (MSB)
		BIT 5		SDRAM Size	Status
		BIT 6		(0=8 MB, 1=16 MB, 2=32 MB, 3=reserved)	BIT 0 (LSB)
		BIT 7		OCM-BIOS Reloading Req	BIT 1 (MSB)
		BIT 0		Extra-Mapper 4096 KB Req	Status
		BIT 1		Slot-0 Mode Req	Status
\$4C	( read only )	BIT 2		Extended MegaROM Reading	0=Primary, 1=Expanded
		BIT 3		IN A,(\$44) : if A=\$00	...
		BIT 4		Free	...
		BIT 5		IN A,(\$44) : if A>\$01	...
		BIT 6		Free	...
		BIT 7		Free	...
		BIT 0		CPU Clock	Hard DIP-SW1
\$4D	( read / write_n )	BIT 1		Video Output (MSB)	Hard DIP-SW2
		BIT 2		Video Output (LSB)	Hard DIP-SW3
		BIT 3		Cartridge Slot-1	Hard DIP-SW4
		BIT 4		Cartridge Slot-2 (MSB)	Hard DIP-SW5
		BIT 5		Cartridge Slot-2 (LSB)	Hard DIP-SW6
		BIT 6		Internal Mapper	Hard DIP-SW7
		BIT 7		Internal MegaSD	Hard DIP-SW8
\$4E	( read only )	BIT 0		64 KB VRAM Slot ID (Page 0)	BIT 0 (LSB)
		BIT 1		OCM-PLD main version X.Y.{z} (range 0.0.x - 25.5.z)	BIT 1
		BIT 2			BIT 2
		BIT 3			BIT 3 (MSB)
		BIT 4			BIT 0 (LSB)
		BIT 5			BIT 1
		BIT 6			BIT 2
\$4F	( read only )	BIT 7			BIT 3 (MSB)
		BIT 0		I/O Revision ID (0 - 31)	BIT 4 (MSB)
		BIT 1		OCM-PLD sub version (x.y).Z (range x.y.0 - x.y.3)	BIT 0 (LSB)
		BIT 2			BIT 1 (MSB)
		BIT 3			Status
		BIT 4			...
		BIT 5			...
\$40	( write only )	BIT 6		VDP ID Selector	0-1=ID0 (V9938), 2-255=ID2 (V9958)
		BIT 7		JIS2 Enabler	0=JIS1+JIS2, 1=JIS1 only
		BIT 0		F4 Device Mode	0=Normal, 1=Inverted
		BIT 1			
		BIT 2			
		BIT 3			
		BIT 4			
\$4E	( write_n only )	BIT 5			
		BIT 6			
		BIT 7			
		BIT 0			
		BIT 1			
		BIT 2			
		BIT 3			
\$4F	( write_n only )	BIT 4			
		BIT 5			
		BIT 6			
		BIT 7			
		BIT 0			
		BIT 1			
		BIT 2			

SMART COMMANDS TABLE			
\$00	(000)	Null Command (reserved)	
\$01	(001)	Set Turbo Pana Redirection OFF (default)	
\$02	(002)	Set Turbo Pana Redirection ON	
\$03	(003)	Set Standard Speed 3.58MHz	
\$04	(004)	Set Custom Speed 4.10MHz	
\$05	(005)	Set Custom Speed 4.48MHz	
\$06	(006)	Set Custom Speed 4.90MHz	
\$07	(007)	Set Custom Speed 5.39MHz	
\$08	(008)	Set Custom Speed 6.10MHz	
\$09	(009)	Set Custom Speed 6.96MHz	
\$0A	(010)	Set Custom Speed 8.06MHz (aka "Turbo 10MHz") (default)	
\$0B	(011)	Set Turbo MegaSD OFF	
\$0C	(012)	Set Turbo MegaSD ON (default)	
\$0D	(013)	Set External Slot-1 + External Slot-2	
\$0E	(014)	Set Internal SCC-I Slot-1 + External Slot-2	
\$0F	(015)	Set External Slot-1 + Internal SCC-I Slot-2	
\$10	(016)	Set Internal SCC-I Slot-1 + Internal SCC-I Slot-2	
\$11	(017)	Set External Slot-1 + Internal ASCII-8K Slot-2	
\$12	(018)	Set Internal SCC-I Slot-1 + Internal ASCII-8K Slot-2	
\$13	(019)	Set External Slot-1 + Internal ASCII-16K Slot-2	
\$14	(020)	Set Internal SCC-I Slot-1 + Internal ASCII-16K Slot-2	
\$15	(021)	Set Japanese Keyboard Layout	
\$16	(022)	Set Non-Japanese Keyboard Layout	
\$17	(023)	Set Display Mode 15KHz Composite/S-Video	
\$18	(024)	Set Display Mode 15KHz RGB w/ Audio Out	
\$19	(025)	Set Display Mode 31KHz VGA for LED TV or LED Display	
\$1A	(026)	Set Display Mode 31KHz VGA+ for CRT Monitor (legacy output)	
\$1B	(027)	Set VDP Speed Normal Mode (default)	
\$1C	(028)	Set VDP Speed Fast Mode (V9958 only)	
\$1D	(029)	Reserve MegaSD OFF (warm reset to go)	
\$1E	(030)	Reserve MegaSD ON (warm reset to go)	
\$1F	(031)	Set MegaSD Blink OFF	
\$20	(032)	Set MegaSD Blink ON (default)	
\$21	(033)	Set Lights Mode OFF w/ Auto LEDs Control (default)	
\$22	(034)	Set Lights Mode ON + Red Led OFF	
\$23	(035)	Set Lights Mode ON + Red Led ON	
\$24	(036)	Internal Audio Preset #1 "Mute Sound"	
\$25	(037)	Internal Audio Preset #2 "Middle Sound"	
\$26	(038)	Internal Audio Preset #3 "High Sound" (default)	
\$27	(039)	Set CMT OFF (default) [disabled w/ MSXtr BIOS]	
\$28	(040)	Set CMT ON (needs a cassette recorder) [disabled w/ MSXtr BIOS]	
\$29	(041)	Lock Turbo Toggles	
\$2A	(042)	Unlock Turbo Toggles	
\$2B	(043)	Lock Display Toggles	
\$2C	(044)	Unlock Display Toggles	
\$2D	(045)	Lock Audio Mixer & SCRLK Toggles	
\$2E	(046)	Unlock Audio Mixer & SCRLK Toggles	
\$2F	(047)	Lock Slot-1 Toggles	
\$30	(048)	Unlock Slot-1 Toggles	
\$31	(049)	Lock Slot-2 Toggles	
\$32	(050)	Unlock Slot-2 Toggles	
\$33	(051)	Lock Slot-1 & Slot-2 Toggles	
\$34	(052)	Unlock Slot-1 & Slot-2 Toggles	
\$35	(053)	Lock Hard Reset Key	
\$36	(054)	Unlock Hard Reset Key	
\$37	(055)	Lock Mapper Toggle	
\$38	(056)	Unlock Mapper Toggle	
\$39	(057)	Lock MegaSD Toggle	
\$3A	(058)	Unlock MegaSD Toggle	
\$3B	(059)	Lock All Toggles	
\$3C	(060)	Unlock All Toggles (default)	
\$3D	(061)	Set Pseudo-Stereo OFF (default)	
\$3E	(062)	Set Pseudo-Stereo ON (needs an external sound cartridge)	
\$3F	(063)	Sync External Bus Clock to CPU Speed (default)	
\$40	(064)	Set External Bus Clock 3.58MHz	
\$41	(065)	Set Turbo Pana 5.37MHz	
\$42	(066)	Set Right Inverse Audio OFF (default)	
\$43	(067)	Set Right Inverse Audio ON	
\$44	(068)	Internal Audio Preset #4 "Emphasis PSG Sound"	
\$45	(069)	Internal Audio Preset #5 "Emphasis SCC-I Sound"	
\$46	(070)	Internal Audio Preset #6 "Emphasis OPL3 Sound"	
\$47	(071)	Vertical Offset 16 (useful for Ark-A-Noah)	
\$48	(072)	Vertical Offset 17	
\$49	(073)	Vertical Offset 18	
\$4A	(074)	Vertical Offset 19 (default)	
\$4B	(075)	Vertical Offset 20	
\$4C	(076)	Vertical Offset 21	
\$4D	(077)	Vertical Offset 22	
\$4E	(078)	Vertical Offset 23	
\$4F	(079)	Vertical Offset 24 (useful for Space Manbow)	
\$50 .. \$53	(080 .. 083)	Set VGA Scanlines 0% .. 25% .. 50% .. 75% (default is 0%)	
\$54	(084)	Set Internal PSG2 OFF (default)	
\$55	(085)	Set Internal PSG2 ON (this second PSG acts as an external PSG)	
\$56	(086)	Set Extra-Mapper 4096 KB OFF (default)	
\$57	(087)	Set Extra-Mapper 4096 KB ON (only available if SDRAM > 8 MB)	
\$58	(088)	Set Extended MegaROM Reading OFF (default for compatibility)	
\$59	(089)	Set Extended MegaROM Reading ON (ASCII-8K/16K max size playable)	
...	...		
\$7F	(127)	Pixel Ratio 1:1 for LED Display (default is 0) (range 0-7) (60Hz only)	
\$80	(128)	Null Command (useful for programming)	
\$81	(129)	Assign Legacy Output to VGA	
\$82	(130)	Assign Legacy Output to VGA+ (default)	
\$83	(131)	Set Internal Slot-1 Linear OFF (default)	
\$84	(132)	Set Internal Slot-1 Linear ON (requires SCC-I preset)	
\$85	(133)	Set Internal Slot-2 Linear OFF (default)	
\$86	(134)	Set Internal Slot-2 Linear ON (requires SCC-I or ASCII-8K/16K preset)	
\$87	(135)	Set Internal OPL3 OFF (default)	
\$88	(136)	Set Internal OPL3 ON	
\$89 .. \$8F	(137 .. 143)	Reserved (Ducasp)	
...	...		
\$80 .. \$87	(176 .. 183)	Set Master Volume 0 .. 7 (default level is 7)	
\$88 .. \$8F	(184 .. 191)	Set PSG Volume 0 .. 7 (default level is 4)	
\$C0 .. \$C7	(192 .. 199)	Set SCC-I Volume 0 .. 7 (default level is 4)	
\$C8 .. \$CF	(200 .. 207)	Set OPL3 Volume 0 .. 7 (default level is 4)	
\$D0	(208)	Force NTSC Mode	
\$D1	(209)	Standard NTSC/PAL Mode (bound by Control Register 9) (default)	
\$D2	(210)	Force PAL Mode	
\$D3	(211)	Restore Default Keyboard Layout	
\$D4	(212)	Null Command (reserved)	
\$D5	(213)	Restore Default Turbo Mode	
\$D6	(214)	Set Centering YJK Modes/R25 Mask OFF (default)	
\$D7	(215)	Set Centering YJK Modes/R25 Mask ON	
\$F8	(248)	Reserve OCM-BIOS Reloading (cold reset or warm reset to go)	
\$F9	(249)	Reserve Slot-0 Primary Mode (warm reset to go) (internal OPL3 disabled) (C-BIOS support)	
\$FA	(250)	Reserve System Logo ON (warm reset only)	
\$FB	(251)	Cold Reset	
\$FC	(252)	Warm Reset w/ Mapper 2048 KB (RAM size 6144 KB if Extra-Mapper is ON)	
\$FD	(253)	Warm Reset	
\$FE	(254)	Warm Reset w/ Mapper 4096 KB (RAM size 8192 KB if Extra-Mapper is ON)	
\$FF	(255)	Restore All Default + Reserve Default Mapper & MegaSD	
More info on Switched I/O ports at MSX Assembly Page! < <a href="http://map.grauw.nl/resources/msx_io_ports.php#switch_io">http://map.grauw.nl/resources/msx_io_ports.php#switch_io</a> >			
R/W Logic	Positive	0 = OFF 1 = ON	( read / write )
	Negative	0 = ON 1 = OFF	( read_n / write_n )
Toggles	CPU Clock	[F12] or [DIP-SW1]	
	Video Output	[(SHIFT+)]PRTSCR] or [DIP-SW2/3]	
	Audio Mixer & SCRLK	[(SHIFT+)]PGUP/PGDOWN/F9/F10/F11] & [SCRLK]	
	Cartridge Slot-1	[(SHIFT+)]F12] or [DIP-SW4]	
	Cartridge Slot-2	[(SHIFT+)]SCRLK] or [DIP-SW5/6]	
	System Reset	[HARD RESET KEY] Fast or Long-Click (normal or full reboot)	
Internal Mapper	[DIP-SW7] only		
Internal MegaSD	[DIP-SW8] only		