$40	(read_n / write)	ID $08 ID $04	MSX2+ FS-A1 Series MSX++ Computers and Compatibles	Z80B 5.37MHz OCM-PLD v2.4 or later
$41	(read_n / write)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Smart Command ID (see the table on the right)	CPL or $FF (null)
$42	(read / write_n)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	CPU Clock Video Output (MSB) Video Output (LSB) Cartridge Slot-1 Cartridge Slot-2 (MSB) Cartridge Slot-2 (LSB) Current Mapper Size Current MegaSD Mode	Virtual DIP-SW1 Virtual DIP-SW2 Virtual DIP-SW3 Virtual DIP-SW4 Virtual DIP-SW5 Virtual DIP-SW6 Virtual DIP-SW7 Virtual DIP-SW8
$43	(read / write_n)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Lock Mask of the Toggles	CPU Clock Video Output Audio Mixer & SCRLK Cartridge Slot-1 Cartridge Slot-2 System Reset Internal Mapper Internal MegaSD
$44	(read / write_n)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Lights I/O + Dynamic ID (d-ID) (SM-X, SX-2 and SX-E only use Led 8 but this register works the same way)	Led 1 Status Led 2 Status Led 3 Status Led 4 Status Led 5 Status Led 6 Status Led 7 Status Led 8 Status
$45	(read / write_n) (read only) (read / write_n) (read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	PSG Volume Level (0 - 7) PSG Mute Master Volume Level (0 - 7) Master Mute	BIT 0 (LSB) BIT 1 BIT 2 (MSB) Status BIT 0 (LSB) BIT 1 BIT 2 (MSB) Status
$46	(read / write_n) (read only) (read / write_n) (read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	OPLL Volume Level (0 - 7) OPLL Mute SCC-I Volume Level (0 - 7) SCC-I Mute	BIT 0 (LSB) BIT 1 BIT 2 (MSB) Status BIT 0 (LSB) BIT 1 BIT 2 (MSB) Status
$47	(read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	CPU Custom Speed Level (1 - 7) Turbo MegaSD (tMSD) Turbo Pana Redirection (tPR) VDP Speed Mode Mapper Size Req MegaSD Mode Req	BIT 0 (LSB) BIT 1 BIT 2 (MSB) Status Status 0=Normal, 1=Fast 0=2048 KB, 1=4096 KB Status
$48	(read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Turbo Pana Current Keyboard Layout SCRLK Toggle Lights Mode Red Mode (Led 0) Last Reset Ack Reset Required Flag MegaSD Blink	Status 0=JP, 1=Non-JP Status 0=Auto, 1=ON Status 0=Cold Reset ack, 1=Warm Reset ack Status Status
$49	(read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Pseudo Stereo External Clock Mode Machine Type ID (0=1chipMSX, 1=Zemmix Neo/SX-1 and related, 2=SM-X/MC2P, 3=SX-2, 4=SM-X Mini/SM-X HB/u2-SX, 5=DE0CV+DEOCM, 6=SX-E/SX-Lite, 7-15=Unknown) NTSC/PAL Type Forced Video Mode	Status 0=Sync to CPU, 1=3.58MHz BIT 0 (LSB) BIT 1 BIT 2 BIT 3 (MSB) 0=Forced, 1=Auto 0=60Hz (NTSC), 1=50Hz (PAL)
$4A	(read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Right Inverse Audio Pixel Ratio 1:1 for LED Display Centering YJK Modes/R25 Mask Assignment of Legacy Output Internal Slot-1 Linear Internal Slot-2 Linear	Status BIT 0 (LSB) BIT 1 BIT 2 (MSB) Status 0=To VGA, 1=To VGA+ Status Status
$4B d-ID $00	IN A,($44) : if A=$00 (read only) [Dynamic Port 4B]	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	VGA Scanlines Level (0=None, 1=Light, 2=Medium, 3=Heavy) Internal PSG2 SDRAM Size (0=8 MB, 1=16 MB, 2=32 MB, 3=Over 32 MB) OCM-BIOS Reloading Req Extra-Mapper 4096 KB Req Slot-0 Mode Req	BIT 0 (LSB) BIT 1 (MSB) Status only for SM-X / SX-2 / SX-E BIT 0 (LSB) BIT 1 (MSB) Status Status 0=Primary, 1=Expanded
$4B d-ID $01	IN A,($44) : if A=$01 (read only) [Dynamic Port 4B]	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Extended MegaROM Reading Auxiliary SDRAM Size (0=64 MB, 1=128 MB, 2=192 MB, 3=256 MB, 4=384 MB, 5=512 MB, 6=768 MB, 7=1024 MB) Vertical Offset (Status+12)	Status BIT 0 (LSB) BIT 1 BIT 2 (MSB) BIT 0 (LSB) BIT 1 BIT 2 BIT 3 (MSB)
$4B d-ID $02	IN A,($44) : if A=$02 (read only) [Dynamic Port 4B]	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	Sprite Limit VGA Interlace Field VGA Scanlines Variant C-BIOS Mode Extra-Mapper 4096 KB Ack Current Slot-0 Mode Safe Mode F2 Device (ESP8266 BIOS)	0=4/8 (standard), 1=8/8 (enhanced) 0=Single, 1=Duplicate 0=Low-Scale, 1=High-Scale Status Status 0=Primary, 1=Expanded Status Status
$4C	(read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	CPU Clock Video Output (MSB) Video Output (LSB) Cartridge Slot-1 Cartridge Slot-2 (MSB) Cartridge Slot-2 (LSB) Internal Mapper Internal MegaSD	Hard DIP-SW1 Hard DIP-SW2 Hard DIP-SW3 Hard DIP-SW4 Hard DIP-SW5 Hard DIP-SW6 Hard DIP-SW7 Hard DIP-SW8
$4D	(read / write_n)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	64 KB VRAM Slot ID (Page 0) 64 KB VRAM Slot ID (Page 1) 	BIT 0 (LSB) BIT 1 BIT 2 BIT 3 (MSB) BIT 0 (LSB) BIT 1 BIT 2 BIT 3 (MSB)
$4E	(read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	OCM-PLD main version X.Y(.z) (range 0.0.z - 25.5.z)	BIT 0 (LSB) BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7 (MSB)
$4F	(read only)	BIT 0 BIT 1 BIT 2 BIT 3 BIT 4 BIT 5 BIT 6 BIT 7	I/O Revision ID (0 - 31) OCM-PLD sub version (x.y).Z (range x.y.0 - x.y.3) Default Keyboard Layout	BIT 0 (LSB) BIT 1 BIT 2 BIT 3 BIT 4 (MSB) BIT 0 (LSB) BIT 1 (MSB) Status

Reserved for IPL-ROM				
$4C	(write only)	BITS 7 .. 0	VDP ID Selector	0-1=ID #0 (V9938), 2-255=ID #2 (V9958)
$4E	(write_n only)	BITS 6 .. 0 BIT 7	- JIS2 Enabler	- 0=JIS1+JIS2, 1=JIS1 only
$4F	(write_n only)	BITS 6 .. 0 BIT 7	- F4 Device Mode	- 0=Normal, 1=Inverted

SMART COMMANDS TABLE			
$00	(000)	Null Command $00 (reserved) (default/break code for IGX smart profile)	
$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	also HDMI AV on SM-X
$1A	(026)	Set Display Mode 31KHz VGA+ for CRT Monitor (legacy output)	also HDMI AV on SM-X
$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)	n/a on SM-X / SX-2 / SX-E
$28	(040)	Set CMT ON (needs a cassette recorder) (disabled w/ MSXtR BIOS)	n/a on SM-X / SX-2 / SX-E
$29	(041)	Lock CPU Clock Toggles	
$2A	(042)	Unlock CPU Clock Toggles	
$2B	(043)	Lock Video Output Toggles	
$2C	(044)	Unlock Video Output 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 System Reset (Reset Combos & Hard Reset Key)	
$36	(054)	Unlock System Reset (Reset Combos & Hard Reset Key)	
$37	(055)	Lock Internal Mapper Toggle	
$38	(056)	Unlock Internal Mapper Toggle	
$39	(057)	Lock Internal MegaSD Toggle	
$3A	(058)	Unlock Internal 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 OPLL 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	(080)	Set VGA Scanlines None (default)	0% low-scale, 0% high-scale
$51	(081)	Set VGA Scanlines Light	12% low-scale, 25% high-scale
$52	(082)	Set VGA Scanlines Medium	25% low-scale, 50% high-scale
$53	(083)	Set VGA Scanlines Heavy	50% low-scale, 75% high-scale
$54	(084)	Set Internal PSG2 OFF (default)	only for SM-X / SX-2 / SX-E
$55	(085)	Set Internal PSG2 ON (this second PSG acts as an external PSG)	only for SM-X / SX-2 / SX-E
$56	(086)	Reserve Extra-Mapper 4096 KB OFF (default)	
$57	(087)	Reserve 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)	
$5A	(090)	Set Sprite Limit 4/8 (standard mode) (default)	
$5B	(091)	Set Sprite Limit 8/8 (force MSX1 screens to use 8 sprites per line)	
$5C	(092)	Set VGA Interlace Single Field (not affected by scanlines) (default)	
$5D	(093)	Set VGA Interlace Duplicate Field	
$7E	(126)	Reserve System Logo ON (warm reset only) [No effect via IPL-ROM]	old I/O specs had $FA (250)
$7F	(127)	Pixel Ratio 1:1 for LED Display (default is 0) (range 0 - 7) (60Hz only)	
$80	(128)	Null Command $80 (reserved) (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)	only for SM-X / SX-2 / SX-E
$88	(136)	Set Internal OPL3 ON	only for SM-X / SX-2 / SX-E
$89	(137)	Set F2 Device OFF (allows I/O access to PlaySoniq and other cartridges)	
$8A	(138)	Set F2 Device ON (essential to execute ESP8266 BIOS) (default)	
$8B .. $8F	(139 .. 143)	Reserved (Ducasp)	only for SM-X / SX-2 / SX-E
$B0 .. $B7	(176 .. 183)	Set Master Volume 0 .. 7 (default level is 7)	
$B8 .. $BF	(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 OPLL 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 $D4 (reserved) + Set C-BIOS Mode ON [Reserved for IPL-ROM]	
$D5	(213)	Restore Default Turbo Modes	
$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 OPLL disabled)	
$FA	(250)	Reserve Slot-0 Expanded Mode (warm reset to go) (default)	
$FB	(251)	Cold Reset [No effect via IPL-ROM]	
$FC	(252)	Warm Reset w/ Mapper 2048 KB (RAM size 6144 KB if Extra-Mapper is ON) [Only set Mapper via IPL-ROM]	
$FD	(253)	Warm Reset [No effect via IPL-ROM]	
$FE	(254)	Warm Reset w/ Mapper 4096 KB (RAM size 8192 KB if Extra-Mapper is ON) [Only set Mapper via IPL-ROM]	
$FF	(255)	Restore All Defaults + Reserve Default Mapper & MegaSD	

More info on Switched I/O ports at MSX Assembly Page! < http://map.grauw.nl/resources/msx_io_ports.php#switch_io >

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]	SCRLK key could handle
	Audio Mixer & SCRLK	[(SHIFT+)PGUP/PGDOWN/F9/F10/F11] & [SCRLK]	CMT or OPL3 depending
	Cartridge Slot-1	[SHIFT+F12] or [DIP-SW4]	on the type of machine
	Cartridge Slot-2	[SHIFT+SCRLK] or [DIP-SW5/6]	
	System Reset	[LCTRL+(SHIFT+)F12] Cold or Full Reset + [HARD RESET KEY] Short or Long-Click	
	Internal Mapper	[DIP-SW7] only	
	Internal MegaSD	[DIP-SW8] only	