SWITCHED I/O PORTS ($40 - $4F) / Revision 001 / by KdL 2011.04.13

Ports

Port	Mode	BIT	Name	Value / Description
$40	(read_n / write)	ID $08	MSX2+ FS-A1 SERIES*	w/ Z80B 5.37MHz
		ID $D4	1CHIPMSX	w/ OCM-PLD Pack v2.4
$41	(read_n / write)	BIT 0		
		BIT 1		
		BIT 2		
		BIT 3	Smart Commands	Get $FF if Not Found
		BIT 4		
		BIT 5		
		BIT 6		
		BIT 7		
$42	(read / write_n)	BIT 0	Green Turbo	Virtual DIP-SW1
		BIT 1	Display (MSB)	Virtual DIP-SW2
		BIT 2	Display (LSB)	Virtual DIP-SW3
		BIT 3	Slot-1	Virtual DIP-SW4
		BIT 4	Slot-2 (MSB)	Virtual DIP-SW5
		BIT 5	Slot-2 (LSB)	Virtual DIP-SW6
		BIT 6	Current Mapper	Virtual DIP-SW7
		BIT 7	Current MegaSD	Virtual DIP-SW8
$43	(read / write_n)	BIT 0	Turbo	
		BIT 1	Display	
		BIT 2	Audio Mixer & CMT	
		BIT 3	Lock Mask of Toggles** — Slot-1	
		BIT 4	Slot-2	
		BIT 5	Hard Reset	
		BIT 6	Mapper	
		BIT 7	MegaSD	
$44	(read / write_n)	BIT 0	Green Led 1	
		BIT 1	Green Led 2	
		BIT 2	Green Led 3	
		BIT 3	Lights Mode I/O — Green Led 4	
		BIT 4	Green Led 5	
		BIT 5	Green Led 6	
		BIT 6	Green Led 7	
		BIT 7	Green Led 8	
$45	(read / write_n)	BIT 0	PSG Volume	BIT 0 (LSB)
		BIT 1		BIT 1
		BIT 2		BIT 2 (MSB)
	(read only)	BIT 3	PSG Mute	Status
	(read / write_n)	BIT 4	Master Volume	BIT 0 (LSB)
		BIT 5		BIT 1
		BIT 6		BIT 2 (MSB)
	(read only)	BIT 7	Master Mute	Status
$46	(read / write_n)	BIT 0	OPLL Volume	BIT 0 (LSB)
		BIT 1		BIT 1
		BIT 2		BIT 2 (MSB)
	(read only)	BIT 3	OPLL Mute	Status
	(read / write_n)	BIT 4	SCC-I Volume	BIT 0 (LSB)
		BIT 5		BIT 1
		BIT 6		BIT 2 (MSB)
	(read only)	BIT 7	SCC-I Mute	Status
$47	(read only)	BIT 0	Custom Speed	BIT 0 (LSB)
		BIT 1		BIT 1
		BIT 2		BIT 2 (MSB)
		BIT 3	Turbo MegaSD (tMSD)	Status
		BIT 4	Turbo Pana Redirection (tPR)	Status
		BIT 5	VGA 60Hz Forced	Status
		BIT 6	Next Mapper	Status
		BIT 7	Next MegaSD	Status
$48	(read only)	BIT 0	Red Turbo (tPANA)*	Status
		BIT 1	Keyboard Layout	Status
		BIT 2	CMT	Status
		BIT 3	Lights Mode	0=Auto, 1=ON
		BIT 4	Red Mode	Red LED Status
		BIT 5	Last Reset Flag	0=Cold, 1=Warm
		BIT 6	Reset Required Flag	Status
		BIT 7	MegaSD Blink	Status
$49 - $4D	(read only)	BIT 0		
		BIT 1		
		BIT 2		
		BIT 3	Null	Free
		BIT 4		
		BIT 5		
		BIT 6		
		BIT 7		
$4E	(read only)	BIT 0	Green Turbo	Hard DIP-SW1
		BIT 1	Display (MSB)	Hard DIP-SW2
		BIT 2	Display (LSB)	Hard DIP-SW3
		BIT 3	Slot-1	Hard DIP-SW4
		BIT 4	Slot-2 (MSB)	Hard DIP-SW5
		BIT 5	Slot-2 (LSB)	Hard DIP-SW6
		BIT 6	Mapper	Hard DIP-SW7
		BIT 7	MegaSD	Hard DIP-SW8
$4F	(read only)	BIT 0	Revision Number	BIT 0 (LSB)
		BIT 1		BIT 1
		BIT 2		BIT 2
		BIT 3		BIT 3
		BIT 4		BIT 4
		BIT 5		BIT 5
		BIT 6		BIT 6 (MSB)
		BIT 7	Keyboard Layout	Default Status

SMART COMMANDS TABLE

Hex	Dec	Description
$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 (default) (originally called 10MHz)
$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 to 15KHz Composite / S-Video
$18	(024)	Set Display Mode to 15KHz RGB w/ Audio (Mono)
$19	(025)	Set Display Mode to 31Khz VGA
$1A	(026)	Set Display Mode to 31Khz VGA w/ High Luminance
$1B	(027)	Set VGA to Original Mode (50Hz + 60Hz)
$1C	(028)	Set VGA to 60Hz Forced (default)
$1D	(029)	Preset MegaSD OFF for next Warm Reset
$1E	(030)	Preset MegaSD ON for next Warm Reset
$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)	Set Audio Mute on PSG, SCC-I and OPLL
$25	(037)	Set Original Audio Settings on PSG, SCC-I and OPLL
$26	(038)	Set Audio at Max Volume on PSG, SCC-I and OPLL (default)
$27	(039)	Set CMT OFF (default)
$28	(040)	Set CMT ON
$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 & CMT Toggles
$2E	(046)	Unlock Audio Mixer & CMT 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)
...	...	...
$80	(128)	Null Command (useful for programming)
...	...	...
...	...	...
$D3	(211)	Restore Keyboard to Default Layout
$D4	(212)	Null Command (reserved)
$D5	(213)	Restore Turbo to Default Setting
...	...	...
...	...	...
...	...	...
...	...	...
$FA	(250)	Restore Last Reset Flag to Cold Reset Status
$FB	(251)	Cold Reset (= Hard Reset)
$FC	(252)	Warm Reset w/ Mapper 2048KB
$FD	(253)	Warm Reset
$FE	(254)	Warm Reset w/ Mapper 4096KB
$FF	(255)	Restore all Default Settings + Preset Mapper & MegaSD to Default

Logic (R / W)

Mode	Values	Logic
(read / write)	0 = OFF / 1 = ON	Positive Logic
(read_n / write_n)	0 = ON / 1 = OFF	Negative Logic

(**) Lock Mask of Toggles

Name	Keys / Switches
Turbo	[F12] [SHIFT+PGUP/PGDOWN] [DIP-SW1]
Display	[PRNSCR] [SHIFT+PRNSCR] [DIP-SW3]
Audio Mixer & CMT	[F9/F10/F11] [SHIFT+F9/F10/F11] [PGUP/PGDOWN] [SCRLCK]
Slot-1	[SHIFT+F12] [DIP-SW4]
Slot-2	[SHIFT+SCRLCK] [DIP-SW5] [DIP-SW6]
Hard Reset	[HARD RESET KEY]
Mapper	[DIP-SW7]
MegaSD	[DIP-SW8]

(*) Adv. to FS-A1WX, FS-A1WSX and FS-A1FX specs:
http://map.grauw.nl/resources/msx_io_ports.php#switch_io