

| \$40                | ( read_n / write )   | ID \$08<br>ID \$D4 | MSX2+ FS-A1 Series<br>MSX++ Computers and Compatibles   | Z80B 5.37MHz<br>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              | CPU Clock<br>Video Output (MSB)<br>Video Output (LSB)<br>Cartridge Slot-1<br>Cartridge Slot-2 (MSB)<br>Cartridge Slot-2 (LSB)<br>Current Mapper Size<br>Current MegaSD Mode   | Virtual DIP-SW1<br>Virtual DIP-SW2<br>Virtual DIP-SW3<br>Virtual DIP-SW4<br>Virtual DIP-SW5<br>Virtual DIP-SW6<br>Virtual DIP-SW7<br>Virtual DIP-SW8 |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
|                     |  | BIT 3              |   |  |
|                     |  | BIT 4              |   |  |
|                     |  | BIT 5              |   |  |
| \$43                | ( read / write_n )   | BIT 6              | Lock Mask of the Toggles  | CPU Clock<br>Video Output<br>Audio Mixer & SCRLK<br>Cartridge Slot-1<br>Cartridge Slot-2<br>Hard Reset Key<br>Internal Mapper<br>Internal MegaSD     |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
|                     |  | BIT 3              |   |  |
|                     |  | BIT 4              |   |  |
| \$44                | ( read / write_n )   | BIT 5              | Lights I/O<br><br>(SM-X, SX-2 and SX-E only use Led 8<br>but this register works the same way)  | Led 1 Status<br>Led 2 Status<br>Led 3 Status<br>Led 4 Status<br>Led 5 Status<br>Led 6 Status<br>Led 7 Status<br>Led 8 Status                         |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
|                     |  | BIT 3              |   |  |
| \$45                | ( read / write_n )<br><br>( read only )<br><br>( read / write_n )<br><br>( read only ) | BIT 4              | PSG Volume Level<br><br>PSG Mute<br><br>Master Volume Level<br><br>Master Mute  | BIT 0 (LSB)<br>BIT 1<br>BIT 2 (MSB)<br>Status<br>BIT 0 (LSB)<br>BIT 1<br>BIT 2 (MSB)<br>Status   |
|                     |  | BIT 5              |   |  |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
| \$46                | ( read / write_n )<br><br>( read only )<br><br>( read / write_n )<br><br>( read only ) | BIT 3              | OPLL Volume Level<br><br>OPLL Mute<br><br>SCC-I Volume Level<br><br>SCC-I Mute  | BIT 0 (LSB)<br>BIT 1<br>BIT 2 (MSB)<br>Status<br>BIT 0 (LSB)<br>BIT 1<br>BIT 2 (MSB)<br>Status   |
|                     |  | BIT 4              |   |  |
|                     |  | BIT 5              |   |  |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
| \$47                | ( read only )  | BIT 2              | CPU Custom Speed Level<br><br>Turbo MegaSD (tMSD)<br>Turbo Pana Redirection (tPR)<br>VDP Speed Mode<br>Mapper Size Req<br>MegaSD Mode Req   | BIT 0 (LSB)<br>BIT 1<br>BIT 2 (MSB)<br>Status<br>Status<br>0=Normal, 1=Fast<br>0=2048 KB, 1=4096 KB<br>Status  |
|                     |  | BIT 3              |   |  |
|                     |  | BIT 4              |   |  |
|                     |  | BIT 5              |   |  |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | \$48               |   |  |
| BIT 1               |  |                    |   |  |
| BIT 2               |  |                    |   |  |
| BIT 3               |  |                    |   |  |
| BIT 4               |  |                    |   |  |
| BIT 5               |  |                    |   |  |
| BIT 6               |  |                    |   |  |
| \$49                | ( read only )  | BIT 7              | Pseudo Stereo<br>External Clock Mode<br>Machine Type ID<br>(0=1chipMSX, 1=Zemmix Neo/SX-1 and related,<br>2=SM-X/MC2P, 3=SX-2, 4=SM-X Mini/SMX-HB,<br>5=DE0CV, 6=SM-X, 7=14=Free, 15=Unknown)<br>NTSC/PAL Type<br>Forced Video Mode | Status<br>0=Sync to CPU, 1=3.58MHz<br>BIT 0 (LSB)<br>BIT 1<br>BIT 2<br>BIT 3 (MSB)<br>0=Forced, 1=Auto<br>0=60Hz (NTSC), 1=50Hz (PAL)                |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
|                     |  | BIT 3              |   |  |
|                     |  | BIT 4              |   |  |
|                     |  | BIT 5              |   |  |
| \$4A                | ( read only )  | BIT 6              | Right Inverse Audio<br>Pixel Ratio 1:1 for LED Display<br>Centering YJK Modes/R25 Mask<br>Assignment of Legacy Output<br>Internal Slot-1 Linear<br>Internal Slot-2 Linear   | Status<br>BIT 0 (LSB)<br>BIT 1<br>BIT 2 (MSB)<br>Status<br>0=To VGA, 1=To VGA+<br>Status<br>Status   |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
|                     |  | BIT 3              |   |  |
|                     |  | BIT 4              |   |  |
| \$4B<br>ID \$00     | IN A,(\$44) : if A=\$00<br><br>( read only )<br><br>[dynamic port 4B]                  | BIT 5              | VGA Scanlines Level (ID*25%)<br>Internal PSG2<br>SDRAM Size<br>(0=8 MB, 1=16 MB, 2=32 MB, 3=Size > 32 MB)<br>OCM-BIOS Reloading Req<br>Extra-Mapper 4096 KB Req<br>Slot-0 Mode Req  | BIT 0 (LSB)<br>BIT 1 (MSB)<br>Status<br>Status<br>0=Primary, 1=Expanded  |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
|                     |  | BIT 3              |   |  |
| \$4B<br>ID \$01     | IN A,(\$44) : if A=\$01<br><br>( read only )<br><br>[dynamic port 4B]                  | BIT 4              | Extended MegaROM Reading<br>Auxiliary SDRAM Size<br>(0=64 MB, 1=128 MB, 2=192 MB, 3=256 MB,<br>4=320 MB, 5=384 MB, 6=448 MB, 7=512 MB)<br><br>Vertical Offset (ID+12)   | Status<br>BIT 0 (LSB)<br>BIT 1<br>BIT 2 (MSB)<br>BIT 0 (LSB)<br>BIT 1<br>BIT 2<br>BIT 3 (MSB)  |
|                     |  | BIT 5              |   |  |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
| \$4C                | ( read only )  | BIT 3              | CPU Clock<br>Video Output (MSB)<br>Video Output (LSB)<br>Cartridge Slot-1<br>Cartridge Slot-2 (MSB)<br>Cartridge Slot-2 (LSB)<br>Internal Mapper<br>Internal MegaSD   | Hard DIP-SW1<br>Hard DIP-SW2<br>Hard DIP-SW3<br>Hard DIP-SW4<br>Hard DIP-SW5<br>Hard DIP-SW6<br>Hard DIP-SW7<br>Hard DIP-SW8                         |
|                     |  | BIT 4              |   |  |
|                     |  | BIT 5              |   |  |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
| \$4D                | ( read / write_n )   | BIT 2              | 64 KB VRAM Slot ID (Page 0)<br><br><br><br>64 KB VRAM Slot ID (Page 1)  | BIT 0 (LSB)<br>BIT 1<br>BIT 2<br>BIT 3 (MSB)<br>BIT 0 (LSB)<br>BIT 1<br>BIT 2<br>BIT 3 (MSB)   |
|                     |  | BIT 3              |   |  |
|                     |  | BIT 4              |   |  |
|                     |  | BIT 5              |   |  |
|                     |  | BIT 6              |   |  |
|                     |  | BIT 7              |   |  |
|                     |  | \$4E               |   |  |
| BIT 1               |  |                    |   |  |
| BIT 2               |  |                    |   |  |
| BIT 3               |  |                    |   |  |
| BIT 4               |  |                    |   |  |
| BIT 5               |  |                    |   |  |
| BIT 6               |  |                    |   |  |
| \$4F                | ( read only )  | BIT 7              | I/O Revision ID (0 - 31)<br><br>OCM-PLD sub version (x.y).Z<br>(range x.y.0 - x.y.3)<br>Default Keyboard Layout   | BIT 0 (LSB)<br>BIT 1<br>BIT 2<br>BIT 3<br>BIT 4 (MSB)<br>BIT 0 (LSB)<br>BIT 1 (MSB)<br>Status  |
|                     |  | BIT 0              |   |  |
|                     |  | BIT 1              |   |  |
|                     |  | BIT 2              |   |  |
|                     |  | BIT 3              |   |  |
|                     |  | BIT 4              |   |  |
|                     |  | BIT 5              |   |  |
| Reserved to IPL-ROM |  |                    |   |  |
| \$4C                | ( write only )   | BIT 0 - 7          | VDP ID Selector   | 0-1=ID0 (V9938), 2-255=ID2 (V9958)   |
| \$4E                | ( write_n only )   | BIT 0 - 6<br>BIT 7 | -<br>JIS2 Enabler   | -<br>0=JIS1+JIS2, 1=JIS1 only  |
| \$4F                | ( write_n only )   | BIT 0 - 6<br>BIT 7 | -<br>F4 Device Mode   | 0=Normal, 1=Inverted   |