# MCU Command List (VER2.17)

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| --- | --- | --- | --- |
| ComNo. | Application | Command | Response |
| 00 | DVR C8051F340 Reset (boot loader command) | 05 01 00 00 02 | “ENTER a Command>” |
| 00 | RF C8051F340 Reset (Boot loader command) | 1.05 01 00 00 02  2.05 02 00 00 02 | “Enter a Command>” |
| 01 | Update DVR C8051F340 application Code(boot loader command) | 05 01 00 01 02 (available in boot code only) | 05 00 01 01 03  if any error occurred during updating firmware:  report error # to CPU:  1.Flash Can not be erased:  06 00 01 01 03 00  2.Hex file type error  06 00 01 01 03 01  3.Address is incorrect:  06 00 01 01 03 02  4.Checksum error:  06 00 01 01 03 03 |
| 02 | Update RF module C8051F340 application Code(boot loader command) | 05 02 00 02 02 (available in boot code only) | 05 00 02 02 03  if any error occurred during updating firmware:  report error # to CPU:  1.Flash Can not be erased:  06 00 02 02 03 00  2.Hex file type error  06 00 02 02 03 01  3.Address is incorrect:  06 00 02 02 03 02  4.Checksum error:  06 00 02 02 03 03 |
| 03 | Update firmware done ,sent by MCU (sent by MCU boot code) | 05 00 01 03 02 | No Rsponse |
| 03 | Update firmware done ,sent by RF(sent by mcu boot code) | 05 00 02 03 02 | No Response |
| 04 | Set ignition turn power on delay time | 08 01 00 04 02 DD DD CK | 06 00 01 04 03 CK |
| 05 | Set ignition turn power off delay time | 08 01 00 05 02 DD DD CK | 06 00 01 05 03 CK |
| 06 | Read I2C/SPI RTC Date and Time | 06 01 00 06 02 CK | 0D 00 01 06 03 SS MN HH DW DD MM YY CK |
| 07 | Set I2C/SPI RTC Date and Time | 0D 01 00 07 02 SS MN HH DW DD MM YY CK | 06 00 01 07 03 CK |
| 08 | Turn off Power sent by MCU | 09 00 01 08 02 DD TH TL CK  which source turn off power  DD=00:ignition turn off power  DD=01:RF turn off power  DD=02:GPIOinput turn off power  TH:power off delay time High Byte  TL:power off delay time Low Byte  TH and TL in second unit | 08 01 00 08 03 TH TL CK  TH: extra off delay time high byte  TL: extra off delay time low byte  [TH:TL] = 0 MCU will be off regularly  [TH:TL] > 0 CPU does not want to off power, need more delay time[TH:TL]  [TH:TL] in second unit.  When MCU receives this response, watchdog will be disabled.  During Power off stage, CPU can send this command again, ask for other extra off delay time.  08 01 00 08 02 TH TL CK |
| 09 | Power not turn Off sent by MCU | 07 00 01 09 02  DD CK  DD: which source cancel power off  DD=00:ignition turn on power  DD=01:RF turn on power  DD=02:GPIOinput turn on power | 07 01 00 09 02 WD CK  WD=0, CPU asks for Watch dog to be disabled  WD >0 CPU ask for Watch dog to be enabled |
| 0A | Report Fan Speed (not used on fan less systems) | 06 01 00 0A 02 CK | 08 00 01 0A 03 DD DD CK |
| 0B | Read IO board SE95 thermometer | 06 00 01 0B 02 CK | 08 00 01 0B 03 TT TT CK |
| 0C | Read HDSE95 thermometer (not used on no HD systems) | 06 01 00 0C 02 CK | 08 00 01 0C 03 TT TT CK |
|  |  |  |  |
|  |  |  |  |
| 10 | Which trigger turn power on | 06 01 00 10 02 CK | 07 00 01 10 02 DD CK  DD=00 by ignition  DD=01 by RF  DD=02 by digital input #6 |
| 11 | HOST boot up ready | 07 01 00 11 02 WD CK  WD = 0: watch dog disable.  WD > 0:Watch dog enable. | 12 00 01 11 03 D0 D1 D2 D3 ….DA CK  D0 = Current digital Input Status:  Bit 7:MC\_USB\_IN  Bit 6:HD\_Insert  Bit [5,0] =GP\_IN\_[5,0]  D2 = Which trigger turn on the system Power  D2=00 by ignition  D2=01 by RF  D2=02 by digital input  D2=0b’11 DVR request  If D2 not 00,01,02,03 then  D2 means power off status.  D2\_Bit7 =1:Ignition is in power off status  D2\_Bit5 =1:RF is in Power off status  D2\_Bit3 =1:Digital input is in Power off status.  D3= default watch dog interval high Byte.  D4= default watch dog interval low Byte.  D5-DA:RTC data, format is the same as command #6:  Sec, Min, Hour, Dow, Date, Mon, Year |
| 12 | CPU request Power off | 06 01 00 12 02 E5 | No response |
| 13 | Define GPIO digital input function | **For MDVR36/SPARTAN:**  07 01 00 13 02 DD CK  **For DD**  Bit1-7: GPIOInput1-7  each bit define the parity of input  0 =low,1= high  Bit0=0: digital input power control disable  Bit0=1: digital input power control enable  Not used bits will be filled with 1  **For TVS34:**  07 01 00 13 02 DD CK  **Only bit1 is for power control, other bit should be filled with 0.**  **Bit1=0, door low active,**  **Bit1=1,door high active.**  For MDVR514M/MDVR618/MDVR818/ZEUS  08 01 00 13 02 DD0 DD1 CK  **For DD0**  Bit1-7: GPIOInput1-7  each bit define the parity of input  0 =low,1= high  Bit0=0: digital input power control disable  Bit0=1: digital input power control enable  For DD1  Bit0-7: GPIOInput8-16  each bit define the parity of input  0 =low,1= high  Not used bits will be filled with 1 | 06 00 01 13 03 CK |
| 14 | DoorInputHiLoActiveStatusChecking  Thius command only for PW AND TVS systems | 06 01 00 14 02 CK | For TVS34:  07 00 01 14 03 DD CK  Each bit in DD=0, Sensor Low active  Each bit in DD = 1,Sensor High Active  For example, DD =FE, means GPIO input0 is Low active, other GPIO input is high active.  DD=0, Door Sensor Low Active  DD=1,Door Sensor High Active  For MDVR36:  07 00 01 14 03 DD CK  Bit0=0 in DD: digital input power control disable  Bit0=1in DD: digital input power control enable  Bit1-7: GPIOInput1-7  each bit define the parity of input  0 =low,1= high  For MDVR618/MDVR514M/MDVR818/ZEUS:  08 00 01 14 03 DD0 DD1 CK  Bit0=0 in DD0: digital input power control disable  Bit0=1in DD0: digital input power control enable  Bit1-7 in DD0: GPIOInput1-7  Bit0-8 in DD1: GPIOInput8-16  each bit define the parity of input  0 =low,1= high |
| 15 | Not used |  |  |
| 16 | Not used |  |  |
| 17 | Not used |  |  |
| 18 | Software Watch Dog Handshake | 06 01 00 18 02 CK | 06 00 01 18 03 CK |
| 19 | Set Software Watch Dog Timeout time | 07 01 00 19 02 DD DD (3-300 seconds) CK | 06 00 01 19 03 CK |
| 1A | Watch Dog Enable | 06 01 00 1A 02 CK | 06 00 01 1A 03 DD CK  DD = 0 failed to enable watchdog.  DD = 1 watchdog enabled successfully |
| 1B | Watch Dog Disable | 06 01 00 1B 02 CK | 06 00 01 1A 03 DD CK  DD = 0, failed to disable watch dog.  DD = 1, watch dog disable successfully |
| 1C | MC command: Notify Host GPIO input status changed | 08 00 01 1C 02 D0 D1 CK  D0 format:  Bit7: MC\_Push\_in  Bit6: HD\_Insert  Bit5: GP\_IN\_5  Bit4: GP\_IN\_4  Bit3: GP\_IN\_3  Bit2: GP\_IN\_2  Bit1: GP\_IN\_1  Bit0: GP\_IN\_0  D1 format:  Bit7: GP\_IN\_13  Bit6: GP\_IN\_12  Bit5: GP\_IN\_11  Bit4: GP\_IN\_10  Bit3: GP\_IN\_9  Bit2: GP\_IN\_8  Bit1: GP\_IN\_7  Bit0: GP\_IN\_6 | 06 10 00 1C 03 CK  This ACK is MUST.  If MCU does not receive this ACK, MCU will keep sending the command until get DVR ACK.  After MCU send this command 10 times, but still does not receive the ACK  MCU will stop sending this status, and will send next status if GPIO changed. |
| 1D | Host request GPIO input status | 06 01 00 1D 02 CK | 0800 01 1D 03 D0 D1 CK  D0 format:  Bit7: MC\_Push\_in  Bit6: HD\_Insert  Bit5: GP\_IN\_5  Bit4: GP\_IN\_4  Bit3: GP\_IN\_3  Bit2: GP\_IN\_2  Bit1: GP\_IN\_1  Bit0: GP\_IN\_0  D1 format  Bit7: do not care  Bit6: do not care  Bit5: do not care  Bit4: GP\_IN\_8  Bit3: GP\_IN\_7  Bit2: GP\_IN\_6  Bit1: do not care  Bit0: do not care |
| 1E | Tab101 input |  |  |
| 1F | Camera\_Zoom\_IN | 06 01 00 1F 02 CK | 06 00 01 1F 03 CK |
| 20 | Camera\_Zoom\_OUT | 06 01 00 20 02 CK | 06 00 01 20 03 CK |
| 20\* | Host request Accelerometer value not used | 06 01 00 20 02 CK | 0C 00 01 20 03 XH XL YH YL ZH ZL CK |
|  |  |  |  |
| 21 | Audio1\_Mixer\_On, | 06 01 00 21 02 CK | 06 00 01 21 03 CK |
| 22 | Audio1\_Mixer\_Off | 06 01 00 22 02 CK | 06 00 01 22 03 CK |
| 23 | Inside1\_CarAudio\_On | 06 01 00 23 02 CK | 06 00 01 23 03 CK |
| 24 | Inside1\_CarAudio\_Off | 06 01 00 24 02  CK | 06 00 01 24 03 CK |
| 25 | Digital Output On | 07 01 00 25 CH 02 CK  DD =1, Digital Output0 On  DD =2, Digital Output1 On  DD =4, Digital Output2 On  DD =8, Digital Output3 On  DD =0x10, USB\_HD\_LED\_ON | 07 00 01 25 02 DD CK  DD =1, Digital Output0 On  DD =2, Digital Output1 On  DD =4, Digital Output2 On  DD =8, Digital Output3 On  DD =0x10, USB\_HD\_LED on |
| 26 | Digital Output Off | 07 01 00 26 02 CH CK  DD =1, Digital Output0 Off  DD =2, Digital Output1 Off  DD =4, Digital Output2 Off  DD =8, Digital Output3 Off  DD =0x10, USB\_HD\_LED Off | 07 00 01 26 02 DD CK  DD =1, Digital Output0 Off  DD =2, Digital Output1 Off  DD =4, Digital Output2 Off  DD =8, Digital Output3 Off  DD =0x10, USB\_HD\_LED Off |
| 27 | Digital Output Toggle | 09 01 00 27 02 DD T1 T2 CK  DD =1, Digital Output0 flashing  DD =2, Digital Output1 flashing  DD =4, Digital Output2 flashing  DD =8, Digital Output3 flashing  DD =0x10, USB\_HD\_LED flashing  T1= flashing ON time  T2 =flashing Off time | 07 00 01 27 03 DD CK  DD =1, Digital Output0 flashing  DD =2, Digital Output1 flashing  DD =4, Digital Output2 flashing  DD =8, Digital Output3 flashing  DD =0x10, USB\_HD\_LED flashing  T1= flashing ON time  T2 =flashing Off time |
| 28 | MC\_USB\_HD\_ON | 06 01 00 28 02 CK | 06 00 01 28 03 CK |
| 29 | MC\_USB\_HD\_OFF | 06 01 00 29 02 CK | 06 00 01 29 03 CK |
| 2A | MC\_USB\_HD\_THR\_ON | 06 01 00 2A 02  CK | 06 00 01 2A 03 CK |
| 2B | MC\_USB\_HD\_ THR \_OFF | 06 01 00 2B 02 CK | 06 00 01 2B 03 CK |
| 2C | Not used |  |  |
| 2D | Check C8051F340 application Code Version Number | 06 01 00 2D 02 CK | 16 00 01 31 03 ”XXXXXX-xx-xx-x.x” CK |
| 2E | On Board Device Power Control | 08 01 00 2E 02 DD CC CK  DD: DEVICE ID different system has different bit definition for device power, such as wifi, GPS, Camera.  Please check with hardware designer.  DD =0, GPS  DD= 1,Wifi  DD = 2,MIC  DD = 3 ZOOM CAM or PAN CAM  DD =4, all regular camera  CC =:ON/OFF switch:00 = off, 01 =on | 06 00 01 2E 03 CK |
| 2F | LED Control | 08 01 00 2F 02 DD CC CK  DD: LED ID  DD = 0, USB Flash  DD =1,Error LED.  DD =2,Video Lost LED  CC: LED Blink On/off control.  1= on  0=off | 06 00 01 2F 03 CK  (notes: MDVR30X and ZEUS3 don’t use this command, they use command 31 instead) |
| 30 |  |  |  |
| 31 | GPIO Output Switch | 07 01 00 31 02 DD CK  DD: GPIO Byte  Bit0: GPIO\_Out0  Bit1: GPIO\_Out1  Bit2: GPIO\_Out2  Bit3: GPIO\_Out3  Bit0: Recording LED  Bit1:Video Loss LED  Bit2:BUZEER LED  Bit3: ERR LED  Bit4: HD LED  Bit5: FLASH LED  //the following not implemented  On ZEUS3,  Bit3: GPIO3  Bit4: Err LED  Bit5: FLASH LED | 06 00 01 31 03 CK |
| 32 | Standby Mode | 06 01 00 32 02 CK | 06 00 01 32 03 CK |
| 33 | Buzzer Control | 07 01 00 33 02 DD CK  DD = 0, Buzzer off  DD = 1,Buzzer On | 06 00 01 33 03CK |
| 34 | Setup Accelerometer | Please see built-In G-force Sensor design Doc for details | Please see built-In G-force Sensor design Doc for details |
| 35 | Upload Accelerometer Data | Please see built-In G-force Sensor design Doc for details | Please see built-In G-force Sensor design Doc for details |
| 36 | Upload Accelerometer Data Confirmation | Please see built-In G-force Sensor design Doc for details | Please see built-In G-force Sensor design Doc for details |
| 37 | Not used |  |  |
| 38 | Wifi power/bus switch control | 07 01 00 38 02 DD CK  DD =0, wifi off  DD =1 wifi on | 06 00 01 38 03 CK |
| 39 | USB switch power control | 07 01 00 39 02  DD CK  DD=0 , usb switch and bus off  DD=1 , usb switch and bus on | 06 00 01 39 03 CK |
| 3A | POE power control | 07 01 00 3A 02 DD CK  DD =0, POE power off  DD =1 POE power on | 06 00 01 3A 03 CK |
| 3B | Radar power control  Notes:  On MDVR\_ZEUS, this command is used to Tab101 power control | 07 01 00 3B 02 DD CK  DD =0, Radar Power off  DD =1 radar power on | 06 00 01 3B 03 CK |
| 3C | Not used |  |  |
| 3D | Not used |  |  |
|  |  |  |  |
| 3F | Accelerometer Compensation | Please see built-In G-force Sensor design Doc for details | Please see built-In G-force Sensor design Doc for details |
| 40 | Accelerometer Response | Please see built-In G-force Sensor design Doc for details |  |
| 41 | Read Power off status from RTC SRAM | 06 01 00 41 02 CK | 0E 00 01 42 03 DD ss mm hr do dd mo yr CK  DD= Reset Source Byte.  ss =second  mm =minute  hr = hour  do= day of week  dd =date  mp =month  yr = year |
| 42 | TAB102 Data uploading | 07 01 00 42 02 DD CK  DD = 1, TAB102 start uploading after this command, do not send any command to MCU  DD = 0; TAB102 finished uploading MCU communication back to normal mode | 06 00 01 42 03 CK  This is a new command, we have not tested yet.!!!! It may cause timing issue,  DVR and MCU designer should work together makes this function working.  This command is only used when TAB102B port is connected to CDC port on DVRs. |
| 43 | Err\_LED Flashing | 07 01 00 43 02 DDck  DD=1 event happens  DD=0 event removes | 06 00 01 43 03 CK  (not used in ZUES3 and ZEUS5) |
| 44 | GPS input | LL 00 07 44 02 D0---DxCK  D0---DX:GPS package | No ACK  (not used in ZUES3 and ZEUS5) |
| 45 | //HBD Enable  Triple DHD poweron | 07 01 00 45 02 DD  Ck  DD=1 #1HD power on  DD=2 #2HD power on  DD=4#3HD power on | 06 00 01 45 03 ck  Only used for triple DHD on ZUES5 |
| 46 | //HBD Enable  Triple DHD poweroff | 07 01 00 46 02 DD  Ck  DD=1 #1HD power off  DD=2 #2HD power off  DD=4#3HD power off | 06 00 01 46 03 ck  Only used for triple DHD on ZUES5 |
| 47 | DVR Reboot | 06 01 00 47 02 CK | 06 00 01 47 03 CK |
| 48 | DVR BATTERY VOLTAGE CHECK | 06 01 00 48 02 CK | 09 00 01 48 03 DD1 DD2 DD3 CK  DD1=battery status 0- fully charged   1. charge in processing 2. disconnected   DD2: voltage value high  DD3: voltage value low  Value x0.016178 |
| 49 | Battery Voltage report | 09 00 01 49 02 DD1 DD2 DD3 CK  DD1=battery status 0- fully charged   1. charge in processing 2. disconnected   DD2: voltage value high  DD3: voltage value low  Value x0.016178 | 06 01 00 49 03 Ck |
| 4a | Batter voltage drop | 06 00 01 4a 02 Ck  Batter voltage drop | 06 01 00 4a 03 Ck |
| 4b | CAM2-4 Power Control | 06 01 00 4b 02 CK | 06 00 01 4b 03 CK |
| 4c | CAM5-6 Power\_Control | 06 01 00 4C 02 CK | 06 00 01 4C 03 CK |
| 4d | FLASH\_STATUS\_CHECK\_REPORT | See doc” **ZEUS6 DVR DATA STORED in SPI-FLASH**  ” | |
| 4e | DVR\_REQUEST\_SPI\_FLASH\_WRITE |
| 4f | DVR\_REQUEST\_SPI\_FLASH\_READ |
| 50 | DVR\_REQUEST\_SPI\_FLASH\_READ\_ACK |
| 51 | USB34\_POWER\_BUS\_CONTROL | 07 01 00 51 02 DD CK  DD = 0x01 USB3 Power on  DD = 0x02 USB4 Power on  DD = 0x04 USB3 BUS on  DD = 0x08  USB4 BUS on  DD = 0x10 USB3 Power off  DD = 0x20  USB4 Power off  DD = 0x40 USB3 BUS off  DD = 0x80  USB4 BUS off | 06 00 01 51 03 CK |
| 52 | Audio2\_Mixer\_On, | 06 01 00 52 02 CK | 06 00 01 52 03 CK |
| 53 | Audio2\_Mixer\_Off | 06 01 00 53 02 CK | 06 00 01 53 03 CK |
| 54 | Inside2\_CarAudio\_On | 06 01 00 54 02 CK | 06 00 01 54 03 CK |
| 55 | Inside2\_CarAudio\_Off | 06 01 00 55 02 CK | 06 00 01 55 03 CK |
| 56 | MIC Trigger Input Status Changed | 07 00 01 56 02 D0  CK  D0 :  Bit0:Mic1 Trigger  Bit1: Mic1 EMR Button  Bit2: Mic2 Trigger  Bit3: Mic2 EMR Button | 06 01 00 56 03  CK |
| 57 | CAM work Mode Selection | 07 00 01 57 02 D0  CK  D0 =0, PAN CAM  D0 = 1, Zoom CAM | 06 01 00 57 03  CK |
| 58 | GPIO OUT0 | 07 00 01 58 02 D0  CK  D0 = 0, off, D0 =1,ON | 06 01 00 58 03  CK |
| 59 | GPIO OUT1 | 07 00 01 59 02 D0  CK  D0 = 0, off, D0 =1,ON | 06 01 00 59 03  CK |

time-by-time when new function is added in the firmware. Max. Number of commands is 256.

Red colour highlight is the latest update.

If you see something is unclear or wrong, please see me.