AOpen XC Cube-AV project Command Set Definitions	
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(1) Data stream format :

Identify code + Class code + Command code + Information code + [Data1] + [Data2] + ... + [Data(n)]

(2) Data structure :

Identify code : 1 byte
bit[7:0] = A0h (always)

Class code : 1 byte
bit[7:4] = always 0000b
bit[3:0] = Class

Command code : 1 byte
bit[7:0] = command (00h ~ FEh)

note: command code (max) = 99h

Information code : 1 byte
bit[7] = always 1b
bit[6:4] = always 000b
bit[3:0] = Data number, in byte (max value = 1111b = f (hex) = 15 (dec))

note: information code (min) = 80h (min data number = 0 byte)
information code (max) = 8fh (max data number = 15 bytes)

(3) Mode description :

1.Function mode [Class code = 0000b] :

Set panel RTC timer [Command code = 60h(W)]
- A0h + 00h + 60h + 83h + data1(hh) + data2(mm) + data3(ss)

Get panel RTC timer [Command code = 61h(R)] - A0h + 00h + 61h + 80h
PS. return A0h + 83h + data1 + data2 + data3
data1 - hours
data2 - minutes
data3 - seconds

Get current mode [command code = 62h(R)] - A0h + 00h + 62h + 80h
PS. return A0h + 81h + data1(mode)
data1(mode) - 01h - PC
02h - DVD/VCD
03h - CD/MP3
04h - 1st stage: TV, 2nd stage: TV/PVR
05h - FM
06h – 1st stage: (None), 2nd stage: PHOTO
07h – 1st stage: (None), 2nd stage: BROWSER/E-MAIL

Set current mode [command code = 63h(W)] - A0h + 00h + 63h + 81h + data1(mode)
PS. data1(mode) - 01h - PC
02h - DVD/VCD
03h - CD/MP3
04h - 1st stage: TV, 2nd stage: TV/PVR

05h - FM
06h – 1st stage: (None), 2nd stage: PHOTO
07h – 1st stage: (None), 2nd stage: BROWSER/E-MAIL

Send ASCII code [Command code = 80h(W)] - A0h + 00h + 80h + 8xh + data1 + data2 ... + data(n)
PS. 1. x = data number in byte
2. x = 0 : Clear all ASCII code (2G ~ 10G, clear ASCII only, not clear Title)

NOTE: (1) Normal ASCII character : 0-9, A-Z, +, -, *, /, Space
(2) Special ASCII Code :

<1> 60H (character [`]) : Show original ASCII character.
<2> 8nH : Set start display position, eg: 85H --> 5G

Example: Show '87' at 8G 7G and show '54' at 5G 4G
--> A0h + 00h + 80h + 86h + 88h + 38h + 37h + 85h + 35h + 34h

Enter suspend [Command code = 30h] - A0h + 00h + 30h + 81h + data1(suspend mode)
PS. data1 – 00h – S0 : power full on (VFD enter Play mode)
01h – S1 : Save power mode(VFD panal will show RTC+Sleep)
02h – S2 : n/a(VFD panal will show RTC+Sleep)
03h – S3 : suspend to ram(VFD panal will show RTC+Sleep)
04h – S4 : suspend to disk(VFD panal will show RTC+Sleep)
05h – S5 : shutdown(VFD panal will show RTC)

Switch mode between RTC timer and play status [Command code = 31h(W)]
- A0h + 00h + 31h + 81h + data1(mode)
PS. data1 - 00h - RTC mode
01h - Play mode

Record mode [Command code = 32h(W)] - A0h + 00h + 32h + 81h + data1(Is Recording?)
PS. data1 - 00 - Disable record mode
01 - Enable record mode

Display Version [Command code = 33h(W)] - A0h + 00h + 33h + 80h
PS. VFD shows current version.

Get current version [Command code = 34h(W)] - A0h + 00h + 34h + 80h
PS. return A0h + 85h + data1 + data2 + ... + data5
Version example: 'R001A'

Set front signal lantern [Command Code = 50h(W)] – A0h + 00h + 50h + 8xh + data1 + … + data(n)
PS. data – bit7-4 : 0 – All
1 – GA1 (Left)
2 – GA2
3 – GA3
4 – GA4
5 – GA5 (only controlled by ACPI, not controlled by this command)
6 – GA6
7 – GA7
8 – GA8
9 – GA9 (Right)
Bit3-0 : 0 – OFF
1 - ON
2 – Half ON

2.Remote control mode [Class code = 0001b] :

Function selection - A0h + 01h + data1 (command code) + 81h + data2 (don't care)

Power On/Off [Command code = 10h] - A0h + 01h + 10h + 81h + xxh
PC [Command code = 11h] - A0h + 01h + 11h + 81h + xxh
DVD/VCD [Command code = 12h] - A0h + 01h + 12h + 81h + xxh
CD/MP3 [Command code = 13h] - A0h + 01h + 13h + 81h + xxh
TV/PVR [Command code = 14h] - A0h + 01h + 14h + 81h + xxh
FM [Command code = 15h] - A0h + 01h + 15h + 81h + xxh
Video Clipper [Command code = 16h] - A0h + 01h + 16h + 81h + xxh
Photo [Command code = 17h] - A0h + 01h + 17h + 81h + xxh
Menu [Command code = 18h] - A0h + 01h + 18h + 81h + xxh
Up [Command code = 19h] - A0h + 01h + 19h + 81h + xxh
Down [Command code = 1ah] - A0h + 01h + 1ah + 81h + xxh
Right [Command code = 1bh] - A0h + 01h + 1bh + 81h + xxh
Left [Command code = 1ch] - A0h + 01h + 1ch + 81h + xxh
Exit [Command code = 1dh] - A0h + 01h + 1dh + 81h + xxh
Enter [Command code = 1eh] - A0h + 01h + 1eh + 81h + xxh
Pause [Command code = 1fh] - A0h + 01h + 1fh + 81h + xxh
Stop [Command code = 20h] - A0h + 01h + 20h + 81h + xxh
F.Forward [Command code = 21h] - A0h + 01h + 21h + 81h + xxh
F.Backward [Command code = 22h] - A0h + 01h + 22h + 81h + xxh
Pre Chapter [Command code = 23h] - A0h + 01h + 23h + 81h + xxh
Next Chapter [Command code = 24h] - A0h + 01h + 24h + 81h + xxh
SUB [Command code = 25h] - A0h + 01h + 25h + 81h + xxh
Audio [Command code = 26h] - A0h + 01h + 26h + 81h + xxh
Scan [Command code = 27h] - A0h + 01h + 27h + 81h + xxh
Mute [Command code = 28h] - A0h + 01h + 28h + 81h + xxh
Vol Up [Command code = 29h] - A0h + 01h + 29h + 81h + xxh
Vol Down [Command code = 2ah] - A0h + 01h + 2ah + 81h + xxh
Record [Command code = 2bh] - A0h + 01h + 2bh + 81h + xxh
Ch Up [Command code = 2ch] - A0h + 01h + 2ch + 81h + xxh
Ch Down [Command code = 2dh] - A0h + 01h + 2dh + 81h + xxh
Fine tune Up [Command code = 2eh] - A0h + 01h + 2eh + 81h + xxh
Fine tune Dn [Command code = 2fh] - A0h + 01h + 2fh + 81h + xxh
MTS [Command code = 30h] - A0h + 01h + 30h + 81h + xxh
Caption MEM [Command code = 31h] - A0h + 01h + 31h + 81h + xxh
0 [Command code = 40h] - A0h + 01h + 40h + 81h + xxh
1 [Command code = 41h] - A0h + 01h + 41h + 81h + xxh
2 [Command code = 42h] - A0h + 01h + 42h + 81h + xxh
3 [Command code = 43h] - A0h + 01h + 43h + 81h + xxh
4 [Command code = 44h] - A0h + 01h + 44h + 81h + xxh
5 [Command code = 45h] - A0h + 01h + 45h + 81h + xxh
6 [Command code = 46h] - A0h + 01h + 46h + 81h + xxh
7 [Command code = 47h] - A0h + 01h + 47h + 81h + xxh
8 [Command code = 48h] - A0h + 01h + 48h + 81h + xxh
9 [Command code = 49h] - A0h + 01h + 49h + 81h + xxh
10 [Command code = 4Ah] - A0h + 01h + 4Ah + 81h + xxh
11 [Command code = 4Bh] - A0h + 01h + 4Bh + 81h + xxh
12 [Command code = 4Ch] - A0h + 01h + 4Ch + 81h + xxh
Jump [Command code = 32h] - A0h + 01h + 32h + 81h + xxh
Time Shift [Command code = 33h] - A0h + 01h + 33h + 81h + xxh
Display [Command code = 34h] - A0h + 01h + 34h + 81h + xxh
Eject [Command code = 35h] - A0h + 01h + 35h + 81h + xxh
Chapter Title [Command code = 36h] - A0h + 01h + 36h + 81h + xxh
Time [Command code = 37h] - A0h + 01h + 37h + 81h + xxh
Repeat [Command code = 38h] - A0h + 01h + 38h + 81h + xxh
STOP(on Panel) [Command code = 80h] - A0h + 01h + 80h + 81h + xxh

Delay time of continue sending pressed key - A0h + 01h + DCh + 81h + 8nh
ps: n = delay n * 0.1 sec (when instant ON, VFD auto set default delay time = 0.3 sec)
--- n (min) = 01h = 1 (min value of delay time = 1 * 0.1 sec = 0.1 sec)
--- n (max) = 0Fh = 15 (max value of delay time = 15 * 0.1 sec = 1.5 sec)

Example: Delay 0.**5** sec - A0h + 01h + DCh + 81h + 8**5**h

(1) Enable COM2 :

(2) **Baud Rate : 9600 bps.**

(3) COM2 (I/O Port address 2F8h, IRQ3).

5.VFD mode [Class code = 0100b] :

Set VFD panel display by **Native Mode** [Command code = 00h(W)]

- A0h + 04h + 00h + 80h : Set all Digit (1G ~ 11G)
- A0h + 04h + 00h + 8xh + data1(Section ID) + data2(Part ID 1) + ... + data(n)(Part ID(n-1))

PS. data1(Section ID) – 81h - 1G
82h - 2G
83h - 3G
84h - 4G
85h - 5G
86h - 6G
87h - 7G
88h - 8G
89h - 9G
8Ah - 10G
8Bh - 11G

data2~n(Part ID) - 00h - Clear all Pn (P1~P17)
01h - Set P1 only
02h - Set P2 only
03h – Set P3 only
04h - Set P4 only
05h - Set P5 only
06h - Set P6 only
07h - Set P7 only
08h - Set P8 only
09h - Set P9 only
10h - Set P10 only
11h - Set P11 only
12h - Set P12 only
13h - Set P13 only
14h - Set P14 only
15h - Set P15 only
16h - Set P16 only
17h - Set P17 only
18h – Set all Pn (P1 ~ P17)

Clear VFD panel display by **Native Mode** [Command code = 05h(W)]

- A0h + 04h + 05h + 80h : Clear all Digit (1G ~ 11G)
- A0h + 04h + 05h + 8xh + data1(Section ID) + data2(Part ID 1) + ... + data(n)(Part ID(n-1))

PS. data1(Section ID) - 81h - 1G
82h - 2G
83h - 3G
84h - 4G
85h - 5G
86h - 6G
87h - 7G
88h - 8G
89h - 9G
8Ah - 10G
8Bh - 11G

data2~n(Part ID) - 00h - Set all Pn (P1~P17)
01h – Clear P1 only
02h – Clear P2 only
03h – Clear P3 only
04h - Clear P4 only
05h - Clear P5 only
06h - Clear P6 only
07h - Clear P7 only
08h - Clear P8 only
09h - Clear P9 only
10h - Clear P10 only
11h - Clear P11 only
12h - Clear P12 only
13h - Clear P13 only
14h - Clear P14 only
15h - Clear P15 only
16h - Clear P16 only
17h - Clear P17 only
18h - Clear all Pn (P1~P17)

NOTE: Native mode can not be used with ASCII mode. 1G and 11G only can use native mode.

Set VFD panel display by **ASCII Mode** [Command code = 01h(W)]
- A0h + 04h + 01h + 82h + data1(Section ID) + data2(ASCII code)
  PS. data1(Section ID) - 82h - 2G
  83h - 3G
  84h - 4G
  85h - 5G
  86h - 6G
  87h - 7G
  88h - 8G
  89h - 9G
  8Ah - 10G

*Section 1G and 11G are invalid.

data2(ASCII code) - 20h~7Ah

Get VFD panel display by native mode [Command code = 02h(R)]
-- deleted (do nothing) --

Get VFD panel display by ASCII mode [Command code = 03h(R)]
-- deleted (do nothing) --

Set VFD panel by **Title Mode** [Command code = 04h(w)]
- A0h + 04h + 04h + 80h : Clear all Title and ASCII (2G~10G)
- A0h + 04h + 04h + 8xh + data1(title) + data2(title) + ... + data(n)(title)
  PS. tilte - 12h - Enable (P1,2G) - [1]
  13h - Enable (P1,3G) - PLAY MODE
  14h - Enable (P1,4G) - CLOCK
  15h - Enable (P1,5G) - [SLEEP]
  16h - Enable (P1,6G) - [TUNED]
  17h - Enable (P1,7G) - [PROG.]
  18h - Enable (P1,8G) - [CHAP]
  19h - Enable (P1,9G) - [TRACK]
  1Ah - Enable (P1,10G) - [TITLE]
  62h - Enable (P16,2G) - [ALL]
  64h - Enable (P16,4G) - co
  66h - Enable (P16,6G) - co
  67h - Enable (P16,7G) - Dp2
  69h - Enable (P16,9G) - Dp2
  73h - Enable (P17,3G) - Dp1
  74h - Enable (P17,4G) - Dp1
  75h - Enable (P17,5G) - Dp1
  76h - Enable (P17,6G) - Dp1
  77h - Enable (P17,7G) - Dp1
  78h - Enable (P17,8G) - Dp1
  79h - Enable (P17,9G) - Dp1
  7Ah - Enable (P17,10G) - Dp1

  92h - Disable (P1,2G) - [1]
  93h - Disable (P1,3G) - PLAY MODE
  94h - Disable (P1,4G) - CLOCK
  95h - Disable (P1,5G) - [SLEEP]
  96h - Disable (P1,6G) - [TUNED]
  97h - Disable (P1,7G) - [PROG.]
  98h - Disable (P1,8G) - [CHAP]
  99h - Disable (P1,9G) - [TRACK]
  9Ah - Disable (P1,10G) - [TITLE]
  E2h - Disable (P16,2G) - [ALL]
  E4h - Disable (P16,4G) - co
  E6h - Disable (P16,6G) - co
  E7h - Disable (P16,7G) - Dp2
  E9h - Disable (P16,9G) - Dp2
  F3h - Disable (P17,3G) - Dp1
  F4h - Disable (P17,4G) - Dp1
  F5h - Disable (P17,5G) - Dp1
  F6h - Disable (P17,6G) - Dp1
  F7h - Disable (P17,7G) - Dp1

F8h - Disable (P17,8G) - Dp1
F9h - Disable (P17,9G) - Dp1
FAh - Disable (P17,10G) - Dp1

NOTE: Title mode can not be used with native mode, only can be used with ASCII mode.

Mode + [Command code = 10h] : A0h + 04h + 10h + 80h

Mode - [Command code = 11h] : A0h + 04h + 11h + 80h
