

## **1. Introduction**

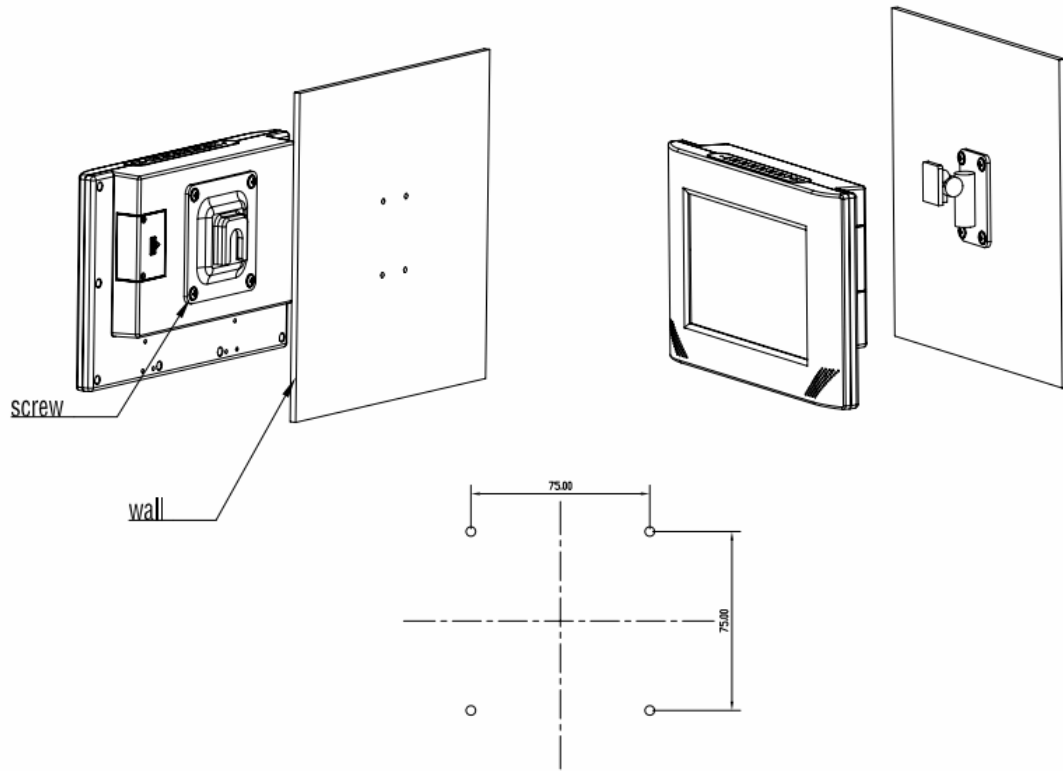
The AP801A advertising panel is suitable for promoting your product in a fancy and interactive way. The video playing ability allows shop owners to show customers their products impressively. Various video formats are supported and they can be copied into AP801A in a drag and drop basis. The text displaying feature can be used to show any transaction message and product information. With the VGA and YUV output, users can project the video into a larger display unit for easy viewing. Networking is possible so that several AP801A can be controlled to play different contents at the same time. VESA mounting is also available for easy installation. Software is provided to control and configure the advertising panel.

## 2. Feature

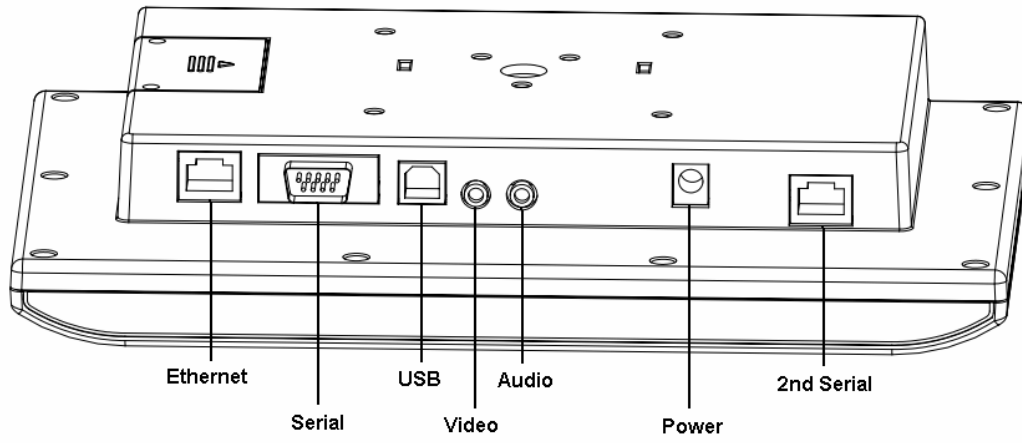
- Support various video format (MPEG-1, MPEG-2, AVI)
- Support variable bit rate MP4, MPEG-2 file decoding up to 10Mbps
- Built-in professional video image processor to support video-scaling function for zooming and 1080i & 720p video out
- Built-in high performance hardware MPEG decoder for decoding MP4 (up to full D1 video resolution), MP2, MP1, DAT(VCD) and VOB(DVD format – 720x576 / 720x480) video file
- Built-in 8 inches TFT panel
- Video can be downloaded from the host either through USB or Ethernet
- Allows commands to be sent from the host through RS232 or Ethernet to control
  - Playback navigation
  - Play mode
  - Text content, text size, text color, text display mode
  - Image content
  - Video size, video display mode
- The screen is divided into three sections: video frame, image frame and text frame, totally of 6 combinations
- Playlist files are used to schedule the playing content on each hour of a day
- Able to accept ESC/POS commands for text display
- Support scrolling text
- Support different language character sets
- 8 time slots for scheduling video download from the FTP server
- Stereo audio output
- YPbPr and VGA video output
- Built-in real time clock
- Support CF card and 2.5 inches harddisk
- Support on the field firmware upgrade
- Support VESA mounting (75mm x 75mm)
- Provide software for changing the settings of the panel

### 3. Installation

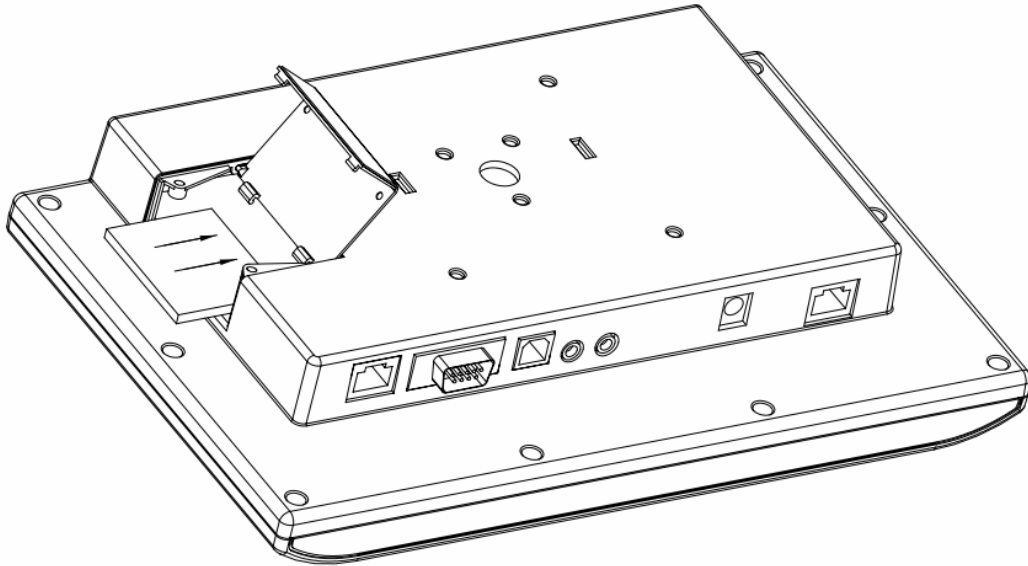
#### 3-1. VESA Mounting



### 3-2. Interface connectors



### 3-3. CF card installation



## 4. Command Set

### 4-1. Communication setting

The communication protocol is byte oriented. Both sending and receiving bytes are in hexadecimal format. The communication parameters are as follows,

Baud rate: 38400 bps  
Data: 8 bits  
Stop: 1 bit  
Parity: None  
Flow control: None

### 4-2. Communication protocol

#### Format:

#### Host to Reader:

Header	Len	Command	Data	Checksum
--------	-----	---------	------	----------

Header: Communication header, 1 byte.  
From host to module: 0xBA.

Len: Byte length counting from Command to Checksum inclusively, 1 byte. If Len is 0x00, the coming two bytes represents the real length. High byte comes first.

Command: Command, 1 byte.

Data: Data, variable length depends on the command type.

Checksum: Exclusive ORed result from Header to Data inclusively, 1 byte.

#### Reader to Host:

Header	Len	Command	Status	Data	Checksum
--------	-----	---------	--------	------	----------

Header: Communication header, 1 byte.  
From module to host: 0xBD.

Len: Byte length counting from Command to Checksum inclusively, 1 byte. If Len is 0x00, the coming two bytes represents the real length. High byte comes first.

Command: Command, 1 byte.

Status: Command status, 1 byte

Data: Data, variable length depends on the command type.

Checksum: Exclusive ORed result from Header to Data inclusively, 1 byte.

#### Command Overview:

Command	Description
0xA3	Set the IP address and the Port Number of the Server
0xA4	Set the IP address and the Port Number of the Server by broadcast message
0xA5	Get the ID of a panel
0xA6	Set the ID of a panel

0xA7	Read Network Configuration
0xA8	Set the IP Address for the FTP Server
0xA9	Get the IP Address for the FTP Server
0xB0	Get Firmware Version
0xB4	Get Memory Usage
0xC0	Play
0xC1	Pause
0xC2	Stop
0xC3	Fast Forward
0xC4	Fast Backward
0xC5	Skip Next
0xC6	Skip Previous
0xC7	Set Play Mode
0xC8	Set Video Mode
0xC9	Set Video Size
0xCA	Set Message Display Mode
0xCB	Set Message Color
0xCD	Set Message Scroll Speed
0xCE	Change Character Set
0xCF	Send Message Text
0xD0	Display Still Image
0xD1	Skip Next Image
0xD2	Skip Previous Image
0xD3	Set Play List Mode
0xD4	Set Synchronization Time
0xD5	Clear Schedule Time
0xD6	Select Audio Channel
0xD7	Adjust Volume
0xD8	Adjust Contrast
0xD9	Adjust Brightness
0xDA	Set Time
0xDB	Get Time
0xDC	Set Date
0xDD	Get Date
0xDE	Change Network Configuration
0xDF	Clear Screen
0xE0	Write Configuration File
0xE1	Read Configuration File
0xE2	Change to Direct Mode
0xE3	Set USB Mode
0xE4	Send Image Text
0xE5	Start Firmware Upgrade
0xE6	Power Control
0xE7	Set Video Output
0xE8	Change to Direct Mode 2

0xE9	Get File Content
0xEA	Exchange UART and LAN data
0xEB	Set Display Time
0xEC	Change Baud Rate
0xED	Set MAC Address
0xEE	Get MAC Address
0xEF	Display Text File
0xF0	Set Debug Mode
0xF1	Restore to Factory Default
0xF2	Get file from FTP sever
0xF3	Set Message Size
0xF4	Display Scroll Message
0xF5	Select Scrolling Line
0xF6	Select Power Mode
0xF7	Power down
0xF8	Set Power Timer
0xF9	Menu Button Control
0xFF	Reset

**Status Overview:**

<b>Status</b>	<b>Description</b>
0x00	Operation success
0x01	File not exist
0x02	Unsupported format
0x03	Action not supported
0x04	First file or last file encountered
0x05	Write error
0x06	Invalid mode
0x07	Invalid shuffle value
0x08	Row out of range
0x09	Column out of range
0x0A	Vertical size out of range
0x0B	Horizontal size out of range
0x0C	Invalid size
0x0D	Invalid color
0x0E	Invalid bg_color
0x0F	Invalid type
0x10	Invalid schedule value
0x11	Slot out of range
0x12	Hour out of range
0x13	Min out of range
0x14	Sec out of range
0x15	Year out of range
0x16	Month out of range
0x17	Day out of range



0x18	Invalid channel value
0x19	Volume out of range
0x1A	Contrast out of range
0x1B	Brightness out of range
0x1C	Invalid DHCP value
0x1D	Invalid power value
0x1E	Server not connected
0x1F	Server timeout
0x20	Server checksum error
0x21	Invalid baud rate
0x22	Write error
0x23	Invalid region
0x24	Empty directory
0xF0	Checksum error
0xF1	Invalid command
0xF2	Communication line error

#### 4-2-4. Get Firmware Version

0xBA	Len	0xB0	Checksum
------	-----	------	----------

Get firmware version

##### Return:

0xBD	Len	0xB0	Status	Version	Checksum
------	-----	------	--------	---------	----------

Status: 0x00: Operation success  
0xF0: Checksum error  
0xF2: Communication line error

Version: The firmware version string

#### 4-2-5. Get Memory Usage

0xBA	Len	0xB4	Checksum
------	-----	------	----------

Get firmware version

##### Return:

0xBD	Len	0xB4	Status	Used	Left	Checksum
------	-----	------	--------	------	------	----------

Status: 0x00: Operation success  
0xF0: Checksum error  
0xF2: Communication line error

Used: Memory used

Left: Memory left

#### 4-2-6. Play

0xBA	Len	0xC0	File	Checksum
------	-----	------	------	----------

File: The file name to be played. The file can be either video or jpeg image. If it is not provided, there will be two cases. The first case is in the stop state, then play the current file. The second case is in the state of PAUSE, FWD and RWD, then resume play.

Note: When the unit starts up, the current file is the first file in the play list. If the play list is

not available, it is the first file in the directory.

**Return:**

0xBD	Len	0xC0	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0x01: File not exist  
0x02: Unsupported format  
0xF0: Checksum error  
0xF2: Communication line error

**4-2-7. Pause**

0xBA	Len	0xC1	Checksum
------	-----	------	----------

Pause the playing file.

**Return:**

0xBD	Len	0xC1	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0x03: Action not supported  
0xF0: Checksum error  
0xF2: Communication line error

**4-2-8. Stop**

0xBA	Len	0xC2	Checksum
------	-----	------	----------

Pause the playing file.

**Return:**

0xBD	Len	0xC2	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0x03: Action not supported  
0xF0: Checksum error  
0xF2: Communication line error

**4-2-9. Fast Forward**

0xBA	Len	0xC3	Checksum
------	-----	------	----------

Fast forward the playing file.

**Return:**

0xBD	Len	0xC3	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0x03: Action not supported  
0xF0: Checksum error  
0xF2: Communication line error

**4-2-10. Fast Backward**

0xBA	Len	0xC4	Checksum
------	-----	------	----------

Fast backward the playing file.

**Return:**

0xBD	Len	0xC4	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0x03: Action not supported

- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-11. Skip Next

0xBA	Len	0xC5	Checksum
------	-----	------	----------

Play next file in the play list. If play list is not available, play the next file in the directory.

#### Return:

0xBD	Len	0xC5	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0x03: Action not supported
- 0x04: First file or last file encountered
- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-12. Skip Previous

0xBA	Len	0xC6	Checksum
------	-----	------	----------

Play previous file in the play list. If play list is not available, play the previous file in the directory.

#### Return:

0xBD	Len	0xC6	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0x03: Action not supported
- 0x04: First file or last file encountered
- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-13. Set Play Mode

0xBA	Len	0xC7	Mode	Shuffle	Checksum
------	-----	------	------	---------	----------

- Mode: 0x00: Play All
- 0x01: Repeat One
- 0x02: Repeat All
- Shuffle: 0x00: Disable Shuffle Play.
- 0x01: Enable Shuffle Play.

#### Return:

0xBD	Len	0xC7	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0x06: Invalid mode
- 0x07: Invalid shuffle value
- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-14. Set Video Mode

0xBA	Len	0xC8	Mode	Row	Checksum
------	-----	------	------	-----	----------

- Mode: 0x01: Video sitting at the upper left corner.
- 0x02: Video sitting at the upper right corner
- 0x03: Video sitting at the lower left corner.

- 0x04: Video sitting at the lower right corner.
- 0x05: Full screen with the text overlay on top.
- 0x06: Same as 0x01 with the image area occupying the whole panel height.
- 0x07: Video sitting at the upper part of the screen, no image area. Only valid for 4:3 panel.
- 0x08: Video sitting at the lower part of the screen, no image area. Only valid for 4:3 panel.

Row: The row the text box should be located. Only used for mode 5.

**Return:**

0xBD	Len	0xC8	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0x06: Invalid mode
- 0x08: Row out of range
- 0xF0: Checksum error
- 0xF2: Communication line error

**4-2-15. Set Video Size**

0xBA	Len	0xC9	Vertical	Horizontal	Checksum
------	-----	------	----------	------------	----------

Vertical: The vertical pixel size.  
 Horizontal: The horizontal pixel size.

**Return:**

0xBD	Len	0xC9	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0x0A: Vertical size out of range
- 0x0B: Horizontal size out of range
- 0xF0: Checksum error
- 0xF2: Communication line error

**4-2-16. Set Message Display Mode**

0xBA	Len	0xCA	Region	Mode	Size	Checksum
------	-----	------	--------	------	------	----------

- Region: 0x00: Message text region
- 0x01: Image text region
- Mode: 0x00: Still
- 0x01: Scroll from left to right
- 0x02: Scroll from right to left
- 0x03: Blinking

**Return:**

0xBD	Len	0xCA	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0x06: Invalid mode
- 0x23: Invalid region
- 0xF0: Checksum error
- 0xF2: Communication line error

**4-2-17. Set Message Color**

0xBA	Len	0xCB	Region	Color	Bg_color	Checksum
------	-----	------	--------	-------	----------	----------

Region: 0x00: Message text region  
           0x01: Image text region  
           0x02: Scroll region  
 Color:  0x00: White  
           0x01: Black  
           0x02: Red  
           0x03: Yellow  
           0x04: Blue  
           0x05: Green  
 Bg\_color: 0x00: White  
           0x01: Black  
           0x02: Red  
           0x03: Yellow  
           0x04: Blue  
           0x05: Green  
           0x06: Transparent

**Return:**

0xBD	Len	0xCB	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
           0x0D: Invalid color  
           0x0E: Invalid bg\_color  
           0x23: Invalid region  
           0xF0: Checksum error  
           0xF2: Communication line error

**4-2-18. Set Message Scroll Speed**

0xBA	Len	0xCD	Speed	Cycle	Checksum
------	-----	------	-------	-------	----------

Speed: The text scrolling speed

**Return:**

0xBD	Len	0xCD	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
           0xF0: Checksum error  
           0xF2: Communication line error

**4-2-19. Change Character Set**

0xBA	Len	0xCE	Set	Checksum
------	-----	------	-----	----------

Set:  0x01: ISO 8859-1  
       0x02: ISO 8859-2  
       0x05: ISO 8859-5  
       0x06: ISO 8859-6  
       0x07: ISO 8859-7  
       0x08: ISO 8859-8  
       0x09: ISO 8859-9  
       0x0B: ISO 8859-11  
       0x0F: ISO 8859-15

**Return:**

0xBD	Len	0xCE	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-20. Send Message Text**

0xBA	Len	0xCF	Text	Row	Column	Checksum
------	-----	------	------	-----	--------	----------

Text: The text string to be displayed.  
 Row: The row to display.  
 Column: The column to display.

**Return:**

0xBD	Len	0xCF	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x08: Row out of range  
 0x09: Column out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-21. Display Still Image**

0xBA	Len	0xD0	File	Checksum
------	-----	------	------	----------

File: The file name to be displayed. If it is not provided, display the current image.  
 Note: When the unit starts up, the current file is the first file in the play list. If the play list is not available, it is the first file in the directory.

**Return:**

0xBD	Len	0xD0	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x01: File not exist  
 0x02: Unsupported format  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-22. Skip Next Image**

0xBA	Len	0xD1	Checksum
------	-----	------	----------

Display next file in the play list. If play list is not available, display the next file in the directory.

**Return:**

0xBD	Len	0xD1	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x04: First file or last file encountered  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-23. Skip Previous Image**

0xBA	Len	0xD2	Checksum
------	-----	------	----------

Display previous file in the play list. If play list is not available, display the previous file in the directory.

**Return:**

0xBD	Len	0xD2	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x04: First file or last file encountered  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-24. Set Play List Mode**

0xBA	Len	0xD3	Type	Schedule	Checksum
------	-----	------	------	----------	----------

Type: 0x00: All  
 0x01: Video only  
 0x02: Image only  
 0x03: Static Text only  
 0x04: Scrolling Text only  
 Schedule: 0x00: Disable  
 0x01: Enable. The panel will refer to the play list file to play the files.

**Return:**

0xBD	Len	0xD3	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x0F: Invalid type  
 0x10: Invalid schedule value  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-25. Set Synchronization Time**

0xBA	Len	0xD4	Slot	Hour	Min	Checksum
------	-----	------	------	------	-----	----------

Slot: We will have maximum 8 different time in which the panel needs to perform schedule synchronization. Each time occupy one slot. Slot start from 1.  
 Hour: The hour for that slot  
 Min: The minute for that slot

**Return:**

0xBD	Len	0xD4	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x11: Slot out of range  
 0x12: Hour out of range  
 0x13: Min out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-26. Clear Schedule Time**

0xBA	Len	0xD5	Slot	Checksum
------	-----	------	------	----------

Slot: The slot number to clear the schedule synchronization. If Slot is 0, clear all slots.

**Return:**

0xBD	Len	0xD5	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x11: Slot out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-27. Select Audio Channel**

0xBA	Len	0xD6	Channel	Checksum
------	-----	------	---------	----------

Channel: 0x00: Stereo  
 0x01: Left  
 0x02: Right

**Return:**

0xBD	Len	0xD6	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x18: Invalid channel value  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-28. Adjust Volume**

0xBA	Len	0xD7	Volume	Checksum
------	-----	------	--------	----------

Volume: The audio volume to be changed to, 0 to 30

**Return:**

0xBD	Len	0xD7	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x19: Volume out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-29. Adjust Contrast**

0xBA	Len	0xD8	Contrast	Checksum
------	-----	------	----------	----------

Contrast: The video contrast to be changed to, 0 to 30

**Return:**

0xBD	Len	0xD8	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x1A: Contrast out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-30. Adjust Brightness**

0xBA	Len	0xD9	Brightness	Checksum
------	-----	------	------------	----------

Brightness: The video brightness to be changed to, 0 to 30

**Return:**

0xBD	Len	0xD9	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x1B: Brightness out of range



0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-31. Set Time

0xBA	Len	0xDA	Hour	Min	Sec	Checksum
------	-----	------	------	-----	-----	----------

Hour: The hour to be set  
 Min: The minute to be set  
 Sec: The second to be set

#### Return:

0xBD	Len	0xDA	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x12: Hour out of range  
 0x13: Min out of range  
 0x14: Sec out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-32. Get Time

0xBA	Len	0xDB	Checksum
------	-----	------	----------

Get the time from the unit

#### Return:

0xBD	Len	0xDB	Status	Hour	Min	Sec	Checksum
------	-----	------	--------	------	-----	-----	----------

Status: 0x00: Operation success  
 0xF0: Checksum error  
 0xF2: Communication line error  
 Hour: The hour to be read  
 Min: The minute to be read  
 Sec: The second to be read

#### 4-2-33. Set Date

0xBA	Len	0xDC	Year	Month	Day	Checksum
------	-----	------	------	-------	-----	----------

Year: The year to be set  
 Month: The month to be set  
 Day: The day to be set

#### Return:

0xBD	Len	0xDC	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x15: Year out of range  
 0x16: Month out of range  
 0x17: Day out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-34. Get Date

0xBA	Len	0xDD	Checksum
------	-----	------	----------

Get the time from the unit

**Return:**

0xBD	Len	0xDD	Status	Year	Month	Day	Checksum
------	-----	------	--------	------	-------	-----	----------

Status: 0x00: Operation success  
 0xF0: Checksum error  
 0xF2: Communication line error

Year: The year to be read  
 Month: The month to be read  
 Day: The day to be read

**4-2-35. Change Network Configuration**

0xBA	Len	0xDE	DHCP	IP	Subnet	Gateway	Checksum
------	-----	------	------	----	--------	---------	----------

DHCP: 0x00: Disable  
 0x01: Enable

IP: The IP address, 4 bytes.  
 Subnet: The subnet mask, 4 bytes  
 Gateway: The gateway address, 4 bytes

**Return:**

0xBD	Len	0xDE	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x1C: Invalid DHCP value  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-36. Clear Screen**

0xBA	Len	0xDF	Type	Checksum
------	-----	------	------	----------

Type: 0x00: All  
 0x02: Image only  
 0x03: Static Text only  
 0x04: Scrolling Text only

**Return:**

0xBD	Len	0xDF	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x0F: Invalid type  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-37. Write Configuration File**

0xBA	Len	0xE0	Node1	Node2	...	NodeN	Value	Checksum
------	-----	------	-------	-------	-----	-------	-------	----------

Node1: a null-terminated string of the 1<sup>st</sup> node  
 Node2: a null-terminated string of the 2<sup>nd</sup> node  
 NodeN: a null-terminated string of the N<sup>th</sup> node  
 Value: a null-terminated string of the value to be written

**Return:**

0xBD	Len	0xE0	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0xF0: Checksum error

0xF2: Communication line error

#### 4-2-38. Read Configuration File

0xBA	Len	0xE1	Node1	Node2	...	NodeN	Checksum
------	-----	------	-------	-------	-----	-------	----------

Node1: a null-terminated string of the 1<sup>st</sup> node

Node2: a null-terminated string of the 2<sup>nd</sup> node

NodeN: a null-terminated string of the N<sup>th</sup> node

#### Return:

0xBD	Len	0xE1	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

Value: a null-terminated string of the value to be read

#### 4-2-39. Change to Direct Mode

0xBA	Len	0xE2	Timeout	Checksum
------	-----	------	---------	----------

Change to Direct Mode

Timeout: The timer will start or reset every time when a byte is received. After passing <Timeout> ms, all buffers will be sent to the screen instantly and the timer will stop counting.

2 bytes, little-endian, units: ms

#### Return:

0xBD	Len	0xE2	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-40. Set USB Mode

0xBA	Len	0xE3	Mode	Checksum
------	-----	------	------	----------

Mode: 0: Disable USB

1: Enable USB

#### Return:

0xBD	Len	0xE3	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0x06: Invalid mode

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-41. Send Image Text

Display Text in Image area

0xBA	Len	0xE4	Text	Row	Column	Checksum
------	-----	------	------	-----	--------	----------

Text: The text string to be displayed.

Row: The row to display.

Column: The column to display.

#### Return:

0xBD	Len	0xE4	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x08: Row out of range  
 0x09: Column out of range  
 0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-42. Start Firmware Upgrade

0xBA	Len	0xE5	Checksum
------	-----	------	----------

Start the firmware upgrade process. The default firmware file is in /update/update.b23

#### Return:

0xBD	Len	0xE5	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-43. Power Control

0xBA	Len	0xE6	Power	Checksum
------	-----	------	-------	----------

Power: 0x00: Power off. Stop video and turn off the screen only. Ethernet remain active.  
 0x01: Power on.

#### Return:

0xBD	Len	0xE6	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x1D: Invalid power value  
 0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-44. Change to Direct Mode 2

0xBA	Len	0xE8	Timeout	Checksum
------	-----	------	---------	----------

Change to Direct Mode

Timeout: The timer will start or reset every time when a byte is received. After passing <Timeout> ms, all buffers will be sent to the screen instantly and the timer will stop counting.  
 2 bytes, little-endian, units: ms

#### Return:

0xBD	Len	0xE8	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-45. Get File Content

0xBA	Len	0xE9	File	Checksum
------	-----	------	------	----------

File: The file name to read.

**Return:**

0xBD	Len	0xE9	Status	Content	Checksum
------	-----	------	--------	---------	----------

Status: 0x00: Operation success  
 0x01: File not exist  
 0x24: Empty directory  
 0xF0: Checksum error  
 0xF2: Communication line error

Content: The file content, maximum 4k Bytes in size. Return the file list if File is a directory.

**4-2-46. Exchange UART and LAN data**

0xBA	Len	0xEA	DataToLAN	Checksum
------	-----	------	-----------	----------

DataToLAN: The data send to LAN

**Return:**

0xBD	Len	0xEA	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x1E: Server not connected  
 0xF0: Checksum error  
 0xF2: Communication line error

Note:

After it receives the command, sends all the data received to the network channel. That is, send

0xBA	Len	0xEA	DataToLAN	Checksum
------	-----	------	-----------	----------

to the server. The server will response with the following format,

0xBD	Len	0xEA	Status	DataToUART	Checksum
------	-----	------	--------	------------	----------

Sends all the data received from the network interface to the UART channel.

**4-2-47. Set Display Time**

0xBA	Len	0xEB	Type	Time	Checksum
------	-----	------	------	------	----------

Type: 0x00: All  
 0x01: Jpeg image only  
 0x02: Image only  
 0x03: Text only

Time: The time interval for displaying the image/text. If this field is equal to 0x00, it will display forever.

**Return:**

0xBD	Len	0xEB	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x0F: Invalid type  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-48. Change Baud Rate**

0xBA	Len	0xEC	Baud	Checksum
------	-----	------	------	----------

Baud: 0x00: 1200bps

0x01: 2400bps  
 0x02: 4800bps  
 0x03: 9600bps  
 0x04: 14400bps  
 0x05: 19200bps  
 0x06: 38400bps  
 0x07: 57600bps  
 0x08: 115200bps

**Return:**

0xBD	Len	0xEC	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x21: Invalid baud rate  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-49. Set MAC Address**

0xBA	Len	0xED	MAC	Checksum
------	-----	------	-----	----------

MAC: The MAC address, 6 bytes

**Return:**

0xBD	Len	0xED	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x22: Write error  
 0xF0: Checksum error  
 0xF2: Communication line error

**4-2-50. Get MAC Address**

0xBA	Len	0xEE	Checksum
------	-----	------	----------

**Return:**

0xBD	Len	0xEE	Status	MAC	Checksum
------	-----	------	--------	-----	----------

Status: 0x00: Operation success  
 0xF0: Checksum error  
 0xF2: Communication line error  
 MAC: The MAC address, 6 bytes

**4-2-51. Display Text File**

0xBA	Len	0xEF	Region	File	Checksum
------	-----	------	--------	------	----------

Region: 0x00: Message text region  
 0x01: Image text region  
 File: The file name to be displayed. (No path name is required.)

**Return:**

0xBD	Len	0xEF	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
 0x01: File not exist  
 0x23: Invalid region  
 0xF0: Checksum error  
 0xF2: Communication line error

#### 4-2-52. Set Debug Mode

0xBA	Len	0xF0	Mode	Checksum
------	-----	------	------	----------

Mode: 0x00: Disable debug mode  
0x01: Enable debug mode

The device will generate a log file in the storage under debug mode. The device will retain its debug mode status even when the power is off.

#### Return:

0xBD	Len	0xF0	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0xF0: Checksum error  
0xF2: Communication line error

#### 4-2-53. Restore Factory Default

0xBA	Len	0xF1	Checksum
------	-----	------	----------

It will restore to the factory default setting.

#### Return:

0xBD	Len	0xF1	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0xF0: Checksum error  
0xF2: Communication line error

#### 4-2-54. Get File from FTP Server

0xBA	Len	0xF2	File	Checksum
------	-----	------	------	----------

File: The file name in the FTP server. The name includes full path. For example, "/my\_txt/example.txt". It will copy the file into the corresponding path in the panel. If this parameter is omitted, the panel will perform the schedule synchronization immediately.

#### Return:

0xBD	Len	0xF2	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0x01: File not exist  
0xF0: Checksum error  
0xF2: Communication line error

#### 4-2-55. Set Message Size

0xBA	Len	0xF3	Region	Size	Checksum
------	-----	------	--------	------	----------

Region: 0x00: Message text region  
0x01: Image text region  
0x02: Scroll region  
Size: 0x00: Normal, 18x9 for European, 18x18 for Chinese  
0x01: Large, 40x20 for European, 40x40 for Chinese

#### Return:

0xBD	Len	0xF3	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success  
0x0C: Invalid size  
0x23: Invalid region

- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-56. Display Scroll Message

0xBA	Len	0xF4	Instant	Type	Message	Checksum
------	-----	------	---------	------	---------	----------

- Instant: 0x00: The message will scroll out after the current scrolling message
- 0x01: The message will scroll out immediately
- Type: 0x00: Message is a null terminated text
- 0x01: Message is a file name (Suppose the file is stored in a fixed path, so there is no need to specify the path name.)
- Message: Either text or file name depends on the Type parameter

#### Return:

0xBD	Len	0xF4	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-57. Select Scrolling Line

0xBA	Len	0xF5	Line	Checksum
------	-----	------	------	----------

- Line: 0x00: Scroll the top line of the text region
- 0x01: Scroll the bottom line of the text region

#### Return:

0xBD	Len	0xF5	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-58. Select Power Mode

0xBA	Len	0xF6	Mode	Checksum
------	-----	------	------	----------

- Mode: 0x00: Device power down after applying power
- 0x01: Device power up after applying power
- (The mode will be saved after power down or reset.)

#### Return:

0xBD	Len	0xF6	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0xF0: Checksum error
- 0xF2: Communication line error

#### 4-2-59. Power Down

0xBA	Len	0xF7	Checksum
------	-----	------	----------

Power down device

#### Return:

0xBD	Len	0xF7	Status	Checksum
------	-----	------	--------	----------

- Status: 0x00: Operation success
- 0xF0: Checksum error
- 0xF2: Communication line error



(The device will power down after the success response is sent out.)

#### 4-2-60. Set Power Timer

0xBA	Len	0xF8	Slot	Power	Type	Time	Date	Checksum
------	-----	------	------	-------	------	------	------	----------

Slot: Timer slot, 0~8.

Power: 0x00: Power down

0x01: Power up

Type: Bit 0~6: 0x00: Clear timer

0x01~0x07: Every Monday to Every Sunday

0x08: Every Weekday (Monday to Friday)

0x09: Once

Time: 4 bytes, BCD in the format of HHMM (24 hour format)

Date: 8 bytes, BCD in the format of YYYYMMDD (Only exist when Type is 0x09)

(The precedence is the highest if Type is 0x09.)

#### Return:

0xBD	Len	0xF8	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-61. Menu Button Control

0xBA	Len	0xF9	Option	Checksum
------	-----	------	--------	----------

Option: 0x00: Disable all buttons

0x01: Only enable power button

0x02: Enable all buttons

#### Return:

0xBD	Len	0xF9	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-62. Reset

0xBA	Len	0xFF	Checksum
------	-----	------	----------

#### Return:

0xBD	Len	0xFF	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-63. Read Network Configuration

0xBA	Len	0xA7	Checksum
------	-----	------	----------

#### Return:

0xBD	Len	0xA7	Status	DHCP	IP	Subnet	Gateway	Checksum
------	-----	------	--------	------	----	--------	---------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

DHCP: 0x00: Disable

0x01: Enable

IP: The IP address, 4 bytes.

Subnet: The subnet mask, 4 bytes

Gateway: The gateway address, 4 bytes

Note: This command should always return IP, Subnet and Gateway.

#### 4-2-64. Set the IP Address for the FTP Server

0xBA	Len	0xA8	FTP	ID	Password	Checksum
------	-----	------	-----	----	----------	----------

FTP: The IP address, 4 bytes.

ID: The login ID to the FTP server, null-terminated string  
(0 means it is anonymous)

Password: The password of the ID, null-terminated string

#### Return:

0xBD	Len	0xA8	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-65. Get the IP Address for the FTP Server

0xBA	Len	0xA9	Checksum
------	-----	------	----------

#### Return:

0xBD	Len	0xA9	Status	FTP	Checksum
------	-----	------	--------	-----	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

FTP: The IP address, 4 bytes.

#### 4-2-66. Set the IP address and the Port Number of the Server (a pc that issues commands through TCP/IP)

0xBA	Len	0xA3	IP	Port	Retry	Interval	Checksum
------	-----	------	----	------	-------	----------	----------

IP: The IP address of the server, 4 bytes

Port: The Port number of the server, 2 bytes, little-endian

Retry: The number of retrials to connect to the server, 1 byte

Interval: The interval between 2 retrials, 1 byte

#### Return:

0xBD	Len	0xA3	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-67. Set the IP address and the Port Number of the Server by broadcast message

0xBA	Len	0xA4	Port	Retry	Interval	Checksum
------	-----	------	------	-------	----------	----------

Len: It must be 6.

Port: The Port number of the server, 2 bytes, little-endian

Retry: The number of retrials to connect to the server, 1 byte

Interval: The interval between 2 retrials, 1 byte

#### No Return:

The panel needn't reply to the server. It will stop listening the broadcast message and then make a connection to the server

#### 4-2-68. Get the ID of a panel

0xBA	Len	0xA5	Checksum
------	-----	------	----------

#### Return:

0xBD	Len	0xA5	Status	ID	Checksum
------	-----	------	--------	----	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

ID: The ID of the panel, 2 bytes, little-endian

#### 4-2-69. Set the ID of a panel

0xBA	Len	0xA6	ID	Checksum
------	-----	------	----	----------

ID: The new ID assigned to the AdPanel, 2 bytes, little-endian

#### Return:

0xBD	Len	0xA6	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0xF2: Communication line error

#### 4-2-70. Set Video Output

0xBA	Len	0xE7	Mode	Checksum
------	-----	------	------	----------

Mode: 0x00 TFT mode

0x01: YUV(1080i)

0x02: YUV(720P)

#### Return:

0xBD	Len	0xE7	Status	Checksum
------	-----	------	--------	----------

Status: 0x00: Operation success

0xF0: Checksum error

0x06: Invalid mode

0xF2: Communication line error

## 4-3. Direct Mode

Besides the standard communication mode, we could accept direct command to display text easily. The cursor concept is implemented. When the host sends some ASCII text to the panel, it will display the text in the current cursor position. The following commands are supported.

### 4-3-1. Select Overwrite Mode

0x1F	0x01
------	------

In overwriting mode, entering a character code moves to the left end of the lower line when the cursor is at the right end of the upper line, and to the left end of the upper line when the cursor is at right end of the lower line. When the power is turned on, this mode is selected by default.

### 4-3-2. Select Vertical Scroll Mode

0x1F	0x02
------	------

In vertical scroll mode, entering a character code moves the cursor to the left end of the lower line when the cursor is at the right end of the upper line, scrolls the characters displayed on the lower line, and clears the lower line when the cursor is at the right end of the lower line. At this time the cursor is moved to the left end of the lower line.

### 4-3-3. Select Horizontal Mode

0x1F	0x03
------	------

In horizontal scroll mode, entering a character code scrolls all displayed characters one character to the left, then displays the new character at the right end.

### 4-3-4. Move the cursor one character position to the left

0x08
------

When the cursor is at the left end of a line, the operation of this command depends on the display mode.

- Overwrite mode: When the cursor is at the left end of the lower line, it is moved to the right end of upper line. When it is at the left end of the upper line, it is moved to the right end of the lower line.
- Vertical scroll mode: When the cursor is at the left end of the lower line, it is moved to the right end of the upper line. When it is at the left end of the upper line, the display on the upper line is scrolled to the lower line and the upper line is cleared. At this time the cursor is moved to the right end of the upper line.
- Horizontal scroll mode: All characters on the current line are scrolled one character to the right. The cursor is not moved, but the character area at the left end is cleared.

### 4-3-5. Move the cursor one character position to the right

0x09
------

When the cursor is at the right end of a line, the operation of this command depends on the

display mode.

- Overwrite mode: When the cursor is at the right end of the lower line, it is moved to the left end of upper line. When it is at the right end of the upper line, it is moved to the left end of the lower line.
- Vertical scroll mode: When the cursor is at the right end of the upper line, it is moved to the left end of the lower line. When it is at the right end of the lower line, the display on the lower line is scrolled to the upper line and the lower line is cleared. At this time the cursor is moved to the left end of the lower line.
- Horizontal scroll mode: All characters on the current line are scrolled one character to the left. The cursor is not moved, but the character area at the right end is cleared.

#### **4-3-6. Move the cursor up one line**

0x1F	0x0A
------	------

When the cursor is at the upper line, the operation of this command depends on the display mode as follows,

- Overwrite mode: The cursor is moved to the same column on the lower line.
- Vertical scroll mode: The characters displayed on the upper line are scrolled to the lower line and the upper line is cleared. The cursor remains at the same position.
- Horizontal scroll mode: The cursor is not moved.

#### **4-3-7. Move the cursor down one line**

0x0A
------

When the cursor is at the lower line, the operation of this command depends on the display mode as follows,

- Overwrite mode: The cursor is moved to the same column on the upper line.
- Vertical scroll mode: The characters displayed on the lower line are scrolled to the upper line and the lower line is cleared. The cursor remains at the same position.
- Horizontal scroll mode: The cursor is not moved.

#### **4-3-8. Move the cursor to the left most position on the current line**

0x0D
------

#### **4-3-9. Move the cursor to the right end position on the current line**

0x1F	0x0D
------	------

#### **4-3-10. Move the cursor to the left end position on the upper line (home position)**

0x0B
------

#### **4-3-11. Move the cursor to the last column of the lower line (end position)**

0x1F	0x42
------	------

#### **4-3-12. Move the cursor to a specified position**

0x1F	0x24	x	y
------	------	---	---

Moves the cursor to the xth column and the yth line.

#### **4-3-13. Clear display screen**

0x0C

#### 4-3-14. Clear cursor line

0x18

Clears the line containing the cursor. After this command is executed, the cursor moves to the left end position on the current line.

#### 4-3-15. Set cursor on/off

0x1F | 0x43 | n

Turns the cursor on or off. The cursor is a underscore.

- When n = 0, the cursor is turned off.
- When n = 1, the cursor is turned on

#### 4-3-16. Set the blink interval

0x1F | 0x45 | n

N specifies the blink interval. When n = 0, the display is kept on. When n = FF, the display is turned off but the contents of the display are maintained. When the power is turned on, n = 0 is selected by default.

#### 4-3-17. Change to Standard Communication Mode

0x1F | 0xBA

Change to Standard Communication Mode.

#### 4-3-18. Initialize Display

0x1B | 0x40

Clear display screen and start video file again.

## 4-4. Direct Mode 2

Besides the standard communication mode, we could accept direct command to display text easily. The cursor concept is implemented. When the host sends some ASCII text to the panel, it will display the text in the current cursor position. The following commands are supported.

### 4-4-1. Select Overwrite Mode

0x1B	0x11
------	------

In overwriting mode, entering a character code moves to the left end of the lower line when the cursor is at the right end of the upper line, and to the left end of the upper line when the cursor is at right end of the lower line. When the power is turned on, this mode is selected by default.

### 4-4-2. Select Vertical Scroll Mode

0x1B	0x12
------	------

In vertical scroll mode, entering a character code moves the cursor to the left end of the lower line when the cursor is at the right end of the upper line, scrolls the characters displayed on the lower line, and clears the lower line when the cursor is at the right end of the lower line. At this time the cursor is moved to the left end of the lower line.

### 4-4-3. Select Horizontal Mode

0x1B	0x13
------	------

In horizontal scroll mode, entering a character code scrolls all displayed characters one character to the left, then displays the new character at the right end.

### 4-4-4. Move the cursor one character position to the left

0x1B	0x5B	0x44
------	------	------

or

0x08
------

When the cursor is at the left end of a line, the operation of this command depends on the display mode.

- Overwrite mode: When the cursor is at the left end of the lower line, it is moved to the right end of upper line. When it is at the left end of the upper line, it is moved to the right end of the lower line.
- Vertical scroll mode: When the cursor is at the left end of the lower line, it is moved to the right end of the upper line. When it is at the left end of the upper line, the display on the upper line is scrolled to the lower line and the upper line is cleared. At this time the cursor is moved to the right end of the upper line.
- Horizontal scroll mode: All characters on the current line are scrolled one character to the right. The cursor is not moved, but the character area at the left end is cleared.

### 4-4-5. Move the cursor one character position to the right

0x1B	0x5B	0x43
------	------	------

or

0x09

When the cursor is at the right end of a line, the operation of this command depends on the display mode.

- Overwrite mode: When the cursor is at the right end of the lower line, it is moved to the left end of upper line. When it is at the right end of the upper line, it is moved to the left end of the lower line.
- Vertical scroll mode: When the cursor is at the right end of the upper line, it is moved to the left end of the lower line. When it is at the right end of the lower line, the display on the lower line is scrolled to the upper line and the lower line is cleared. At this time the cursor is moved to the left end of the lower line.
- Horizontal scroll mode: All characters on the current line are scrolled one character to the left. The cursor is not moved, but the character area at the right end is cleared.

#### 4-4-6. Move the cursor up one line

0x1B | 0x5B | 0x41

When the cursor is at the upper line, the operation of this command depends on the display mode as follows,

- Overwrite mode: The cursor is moved to the same column on the lower line.
- Vertical scroll mode: The characters displayed on the upper line are scrolled to the lower line and the upper line is cleared. The cursor remains at the same position.
- Horizontal scroll mode: The cursor is not moved.

#### 4-4-7. Move the cursor down one line

0x1B | 0x5B | 0x42

When the cursor is at the lower line, the operation of this command depends on the display mode as follows,

- Overwrite mode: The cursor is moved to the same column on the upper line.
- Vertical scroll mode: The characters displayed on the lower line are scrolled to the upper line and the lower line is cleared. The cursor remains at the same position.
- Horizontal scroll mode: The cursor is not moved.

#### 4-4-8. Move the cursor to the left most position on the current line

0x1B | 0x5B | 0x4C

or

0x0D

#### 4-4-9. Move the cursor to the right end position on the current line

0x1B | 0x5B | 0x52

#### 4-4-10. Move the cursor to the left end position on the upper line (home position)

0x1B | 0x5B | 0x4C

or

0x0B

#### 4-4-11. Move the cursor to the last column of the lower line (end position)



0x1B	0x5B	0x4B
------	------	------

#### **4-4-12. Move the cursor to a specified position**

0x1B	0x6C	x	y
------	------	---	---

Moves the cursor to the xth column and the yth line.

#### **4-4-13. Clear display screen**

0x0C
------

#### **4-4-14. Clear cursor line**

0x18
------

Clears the line containing the cursor. After this command is executed, the cursor moves to the left end position on the current line.

#### **4-4-15. Set cursor on/off**

0x1B	0x5F	n
------	------	---

Turns the cursor on or off. The cursor is a underscore.

- When n = 0, the cursor is turned off.
- When n = 1, the cursor is turned on

#### **4-4-16. Change to Standard Communication Mode**

0x1B	0xBA
------	------

Change to Standard Communication Mode.

## 5. Specification

<b>LCD Panel</b>	LCD Size	8.0 inches (Diagonal)
	Resolution	800 x 480 x 3(RGB)
	Active area	176.64(W) x 99.36(H) mm
	Brightness	250 cd / m <sup>2</sup>
	Driver element	a-Si TFT active matrix
<b>Video</b>	Video format	MPEG-1(MPG, DAT), MPEG-2(VOB, ISO, IFO), MPEG4(AVI, MP4), DivX from 3.11 to 5.11 Video, Xvid
	Resolution	Upscaling (1280x720p, 1920x1080i)
	Video Out	YPbPr, VGA
	Photo format	JPG
<b>Audio</b>	Speaker	Built-in two 1W speakers
	Audio Jack	Stereo analog
<b>Interface</b>	USB-B	USB 2.0
	DB9	RS232
	RJ-45	Ethernet
<b>Storage</b>	Memory Card	Supports CF card, type I/II
	Hard Disk	Supports 2.5 inch ATA hard disk
<b>Other</b>	Clock	Built-in real time clock
<b>Mounting</b>	Standard	VESA compliant (100mm x 100mm)
<b>Power</b>	Adaptor	12V DC 1.5A (US, EU, UK)
<b>Environment</b>	Operating Temperature	0°C ~ 42°C
	Storage Temperature	-25°C ~ 70°C
	Humidity	10% - 85% RH non condensing

## 5. Declaration

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.