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# C6820 加强型 JPEG 压缩串口模块

## 用户手册 V2.0

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## 第一部分 硬件

### 1. 简介

该说明书主要介绍 C6820 加强型 JPEG 压缩串口摄像模块的特性，功能和接口等情况。

C6820 加强型 JPEG 模块是一款体积小，重量轻，功耗小的设备，它具备了大部分数字照相机（DSC）的功能，可以照相，录像，显示日期时间和文件管理等。用户可以利用外部的微型控制器，优化的简单易操作指令将此模块用于其它特殊用途。

说明书对模块的所有功能都有介绍，而且针对每个功能也会给出一个合适的指令操作顺序。

### 2. 特性

- UART 接口控制模块
- 简单易操作指令
- 不同波特率可选适应大部分 MCU 和 PC 软件
- 支持 2G SD 卡存储
- 实时复合食品信号输出
- USB 存储功能

### 3. 模块规格

图像传感器	3M CMOS sensor OV3620
图像处理器	ZORAN COACH-6E
自带存储容量	128Mb (8M bytes)
存储器	2GB SD 卡 32MB NAND Flash
输出接口	复合视频信号输出
视频格式	640X480 (30fps); 320x240 (30fps) 无限制获得 JPEG 图像 (取决于存储器容量)
图像分辨率	1280x960, 640x480 JPEG 格式
白平衡	正常/日光/钨丝灯/荧光灯/阴天
UART 波特率	115200, 57600bps
TV 输出制式	NTSC/PAL
USB 接口	USB1.1 海量存储模式; 支持 Win2000/XP/ME 系统
电源	5V 直流电源

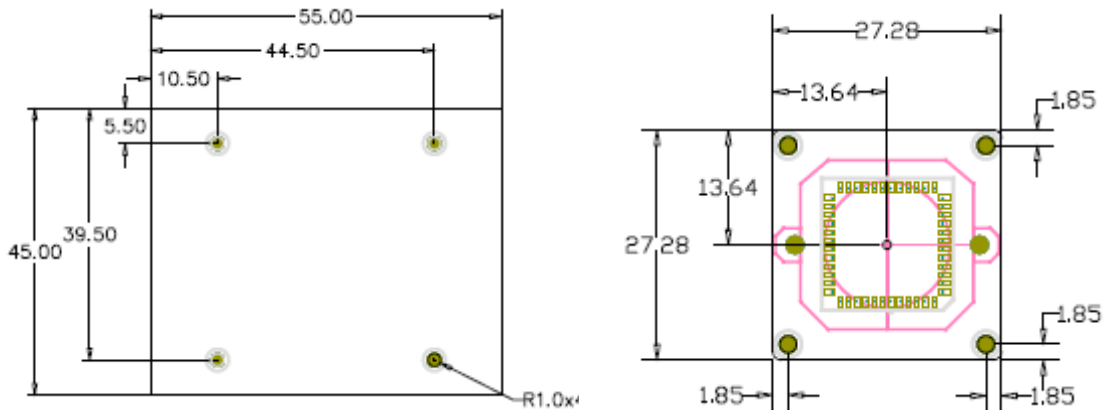
### 4. 电子参数 (5V DC)

不连接 TV			
条件	最小值	最大值	单位
预览	164	168	毫安(mA)
JPG (照相时峰值)	225	270	毫安(mA)
AVI (录像时峰值)	286	295	毫安(mA)
连接 TV			
条件	最小值	最大值	单位
预览	165	168	毫安(mA)
照相 JPG	226	272	毫安(mA)



录像 AVI	286	300	毫安(mA)
回放 JPG	180	220	毫安(mA)
回放 AVI	195	225	毫安(mA)

## 5. 制板尺寸



## 6. 产品介绍

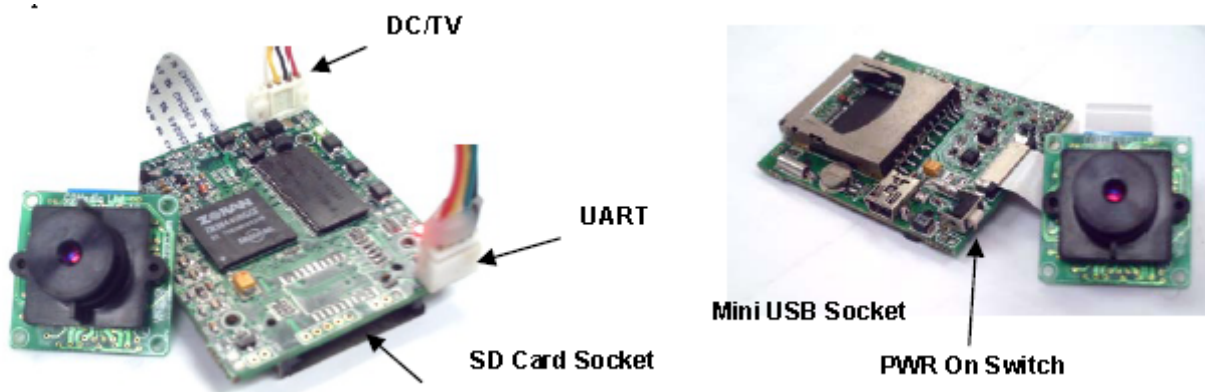
- 电压 给模块供电的外部电源必须满足如下要求。  
 额定工作电压：DC5V 工作电压范围：DC4.5V-5.5V
- 传感器 百万像素 CMOS 图像传感器。Sensor 板和主板之间用软排线连接。
- 照相 支持 1280\*960, 640\*480 分辨率的图片，压缩率范围 1x—45X。
- 录像 不限制录像时间，录像时间取决于存储器的大小。录像文件为 AVI 格式，可选 640\*480 (30fps) 和 320\*480 (30fps)。压缩率大小也是 1x—45x。
- 存储 自带 32M (32M\*8bits) 的 NAND flash，外部存储可支持 2GB 的 SD 卡（可选）。
- 输出 提供实时复合视频信号输出，用户可以选择 TV 标准，NTSC/PAL。
- 串口 支持 UART 串口，基于标准 PCI116550 UART 设备。支持全双工通信，便于用户利用不同平台通信。波特率可选 115200bps, 57600bps。
- USB USB1.1 接口，便于用户使用 PC 下载和存储图像（Windows XP 以上系统无需安装驱动）。

## 7. 接口连接器介绍

该模块有 3 个接口

连接口	描述
USB	USB 可连接到 PC 进行数据传输
DC/TV	适配电线提供视频和电源输入
UART	UART 接口连接后端设备

各接口位置如下





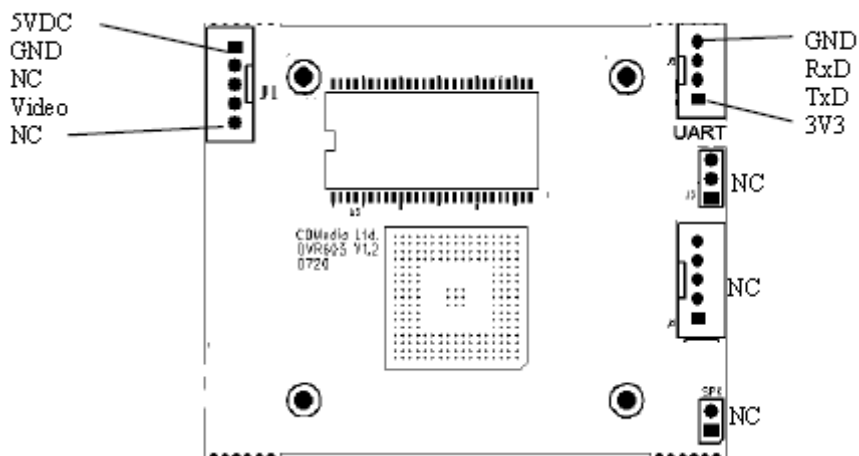
各接口的 pin 脚如下表所述

USB I/F PIN-out				
USB mini-B				
Pin	符号	I/O	功能	类型
1	Vbus		PC USB 接口电源	电源
2	D-	O	USB 负极信号	数据
3	D+	I	USB 正极信号	数据
4	NC		未连接	NC
5	GND		数据接地	电源

UART I/F PIN-out				
DIP 型 4*1-2.0mm 间距槽				
Pin	符号	I/O	功能	类型
1	C3V3		数据 +3.3V	电源
2	TXD	I/O	UART 串口发送输出	数据
3	RYD	I/O	UART 串口接收输入	数据
4	DGND		未连接	电源

DCTV PIN-out J1				
DIP 型 5*1 2mm 间距槽				
Pin	符号	I/O	功能	类型
1	Vin		5V DC 电源	电源
2	GND		接地	电源
3	NC		未连接	NC
4	Video Out	O	数据接地	模拟
5	NC		未连接	NC

Pin 脚详细图示





## 第二部分 指令清单

### 1. 基本操作

**1.1 模块开/关:** 按 PWRON 开关启动模块, 此时 LED 灯亮。关闭模块时也是同样操作。

**1.2 与模块同步:** 在发送指令给模块前, 主控设备需要发送同步命令给模块来确认连接。

0xaa 00 b0 04 aa (等待 10ms)

重复该动作直至模块回复

0xaa 01 b0 00 05 aa

详细请参考 0xb0 (176) 指令

**1.3 软件控制关闭模块:** 发送关机指令

0xaa 00 01 55 0a

等待模块回复 “OK”

0xaa 00 01 00 56 aa

回复 OK 后, 模块会马上关机。

详细信息请参考 0x01 (1) 指令。

注意: 关机后, 若想启动模块请按 PWRON 键。

**1.4 连接 TV:** 使用 DC/TV 适配电线和 RCA 插口连接 TV 好后, 通过 UART 接口操作回放, TV 上会显示视频图像。不是任何时候都需要连接 TV, 只是在设置模块系统和回放文件时才需要。

**1.5 连接 PC:** 用 USB 电线连接 PC 时, 模块表现为海量存储设备。注意: 当连接 USB 时, 其余功能都不能用。

### 2. 指令

#### 2.1 指令定义

控制模块工作, 必须发送相应的指令。所有指令均采用 16 进制。主要有 4 类指令控制模块工作: ID Command, Parameter Command, ACK Command 和 Data Packet。

所有的指令都包含 synchronization bytes 和 checksum。

Synchronization bytes(0xaa), 位于每个指令的头和尾, 用于主控设备和模块之间进行同步。

Checksum 是相应指令中其它字节的最低 8 位总和。用于效验指令。

**ID Command** 是一个五字节指令, 包含了 command ID, the length of the parameters in the following parameter command 和 checksum。模块执行的指令都带有 command ID。有了 command ID, 模块才知道该执行什么功能和后续会收到什么类型的参数。ID Command 的格式如下。

格式 (5bytes)	Sync Byte (8 bits)	Length of the parameter in unit of byte (8 bits)	Command ID in HEX (8 bits)	Checksum (8 bits)	Sync Byte (8 bits)
示例 ( <b>set the system clock</b> )	0xaa	0x07	0x03	0x5e	0xaa

在示例中, command ID 为 0x03, 设置系统时间和在后续参数中的参数大小为七字节。

同样, checksum=the lowest eight bits of (0xaa+0x07+0x03+0xaa=0x15e) =0x5e

**Parameter Command** 为长度可变的指令, 包含了对应之前 ID command 的 parameters, 像日期和时间需要设置。它通常都会发送给接下来的 ID command。如果 ID command 的参数的大小为 0, 那么就



不需要 parameter command。Parameter command 的格式如下。

格式	Sync Byte (8 bits)	Parameter(variable)	Checksum (8 bits)	Sync byte (8 bits)
示例 (set the system clock)	0xaa	0x07 0xd5 0x04 0x0c 0x11 0x36 0x00 (2005-04-12 11:54:00)	0x87	0xaa

**ACK Command** 也是长度可变指令, 包含 acknowledgement 和 ID command 和 parameter command 返回的结果, 例如要求的日期时间以及版本号。同样也包含了 length of the result 和 checksum 来进行确认。ACK command 的格式如下。

格式	Sync byte (8 bits)	Length of the return in unit of byte (8bits)	Command ID to ACK (8 bits)	Return(variable)	Checksum (8 bits)	Sync byte (8 bits)
示例 (request the System clock)	0xaa	0x07	0x04	0x07 0xd5 0x04 0x0c 0x11 0x36 0x00 (2005-04-12 11:54:00)	0x92	0xaa

**Data Packet** 用于主控设备从模块上下载图像或者视频文件。Data packet 的格式如下。

格式	Sync byte (8 bits)	Serial number of the packet 16 bits <sup>9</sup> (from 0x0001-0xffff)	File content	Checksum (16 bits)	Sync byte (8 bits)
示例	0xaa	0x0001	0x03 0x12 0x77...0x5e	0xf655	0xaa

Data packets 中的 checksum (16 bits) 是 synchronization bytes, serial number 和 file content 中最低 16 位的总和。与其它指令的 8 位 checksum 有所不同。

收到数据包后, 主控设备需要回复 ACK command 来进行确认。数据传送的 return code 清单如下所示。

- Return: 0x00 成功确认, 传送下一个数据包  
 0x01 确认失败, 重新发送当前的数据包  
 0xff 传送终止

## 2.2 指令操作

### 2.2.1 工作模式

共有 3 种工作模式, 分别是预览, 照相/录像和回放模式。指令在正确的模式下才能工作, 有些指令在任意模式中都能工作, 但是有些指令就只能在特定的模式下才能工作。

- 如: 1. system setup: 可以在任意模式里工作  
 2. set picture parameter: 只能在照相/录像模式里工作  
 3. down load data: 只能在预览模式里工作

详细请参看 0x1e (30) 指令





### 2.2.2 工作顺序

有些指令需要在执行前按照顺序逐一发送。详细的细节请参考指令描述。另外，如果在发送指令时出现错误，主控设备需要重新发送指令，否则，会一直回复失败信息。

### 3. 指令总结

系统设置			
ID in Dec	ID in Hex	功能	
0	0x00	Restore factory configuration	恢复出厂设置
1	0x01	Shutdown	关机
2	0x02	Request the revision identification	询问模块版本号
3	0x03	Set the system clock	设置系统时钟
4	0x04	Request the system time	询问系统时间
6	0x06	Snapshot configuration	照相配置
30	0x1e	Select the operation mode	选择工作模式
31	0x1f	Request the current operation mode	询问当前工作模式
159	0x9f	Select the Baud rate	选择波特率
176	0xb0	Synchronization signal	同步

JPEG Capture			
ID in Dec	ID in Hex	功能	
50	0x32	Set picture resolution&compression ratio	设置图像分辨率和压缩率
51	0x33	Request the current Luminance	询问当前亮度
53	0x35	Data Time Stamping	显示日期时间
54	0x36	String Stamping	显示字符
56	0x38	Sequence capture	连拍

AVI Capture			
ID in Dec	ID in Hex	功能	
81	0x51	Set resolution&compression ratio of AVI recored	设置 AVI 文件分辨率和压缩率
84	0x54	Start/Stop recording AVI	开始/停止录像

File Management			
ID in Dec	ID in Hex	功能	
120	0x78	Request the file information	询问当前文件信息
121	0x79	Download file from Module(Function in IDLE mode ONLY)	从模块下载文件(只能在预览模式下)
122	0x7a	Delete the targeted file	删除目标文件
200	0xc8	Playback the current AVI	回放当前 AVI
201	0xc9	Select the previous/Next file	选择前一个/后一个文件
202	0xca	Select a particular file	选择指定文件

Storage Media Management			
ID in Dec	ID in Hex	功能	
100	0x64	Select the storage media	选择存储媒介
101	0x65	Format the storage media	格式化存储媒介
102	0x66	Request information of the current storage media	询问当前存储媒介信息



Interface Management		
ID in Dec	ID in Hex	功能
155	0x9b	Select the TV Standard 选择 TV 制式
169	0xa9	Resuest connection status of external memory 询问外部记忆媒介的连接状态

#### 4. 指令清单

##### 0 – 0x00 – Restore factory configuration

<b>ID</b>	0x00
<b>Description</b>	Restore the configuration of the JPEG Module to the factory setting Parameter: N/A
<b>ID Command</b>	0xaa 00 00 54 aa
<b>Operation Mode</b>	Preview/playback mode
<b>Parameter Command</b>	N/A
<b>Return from the JPEG Module</b>	0x00: OK/ 0x01: Failed/ 0x02: USB Mode
<p>Example: Restore the configuration of the JPEG Module to the factory one</p> <p>Host: 0xaa 00 00 54 aa      Module: 0xaa 01 00 00 55 aa</p> <p>Wait for OK</p> <p># Length of the return = 1 byte;                      Command ID to ACK = 0x00;                      Return = 0x00 (OK);                      Checksum = 0x55</p>	
<p><b>Remark: factory configuration includes the following parameters</b>                      wSize, eTVStd, eWBMode, eStrobeMode, eColorEffect, elmgQty, elmgRes, eAviQty, uAviRes, eContrast, eEV, uFrequency, eSharpness, uAviTriTime, uTrigMask, bTrigMode, bAudioOn</p>	

##### 1 – 0x01 – Shutdown

<b>ID</b>	0x01
<b>Description</b>	Software shutdown the JPEG Module Parameter:N/A
<b>ID Command</b>	0xaa 00 01 55 aa
<b>Parameter Command</b>	N/A
<b>Operation Mode</b>	Preview/playback mode
<b>Return from the JPEG Module</b>	0x00:OK/ 0x01:Failed
<p>Example: Software shutdown the JPEG Module</p> <p>Host: 0xaa 00 01 55 aa      Module: 0xaa 01 01 00 56 aa</p> <p>Wait for OK</p> <p># Length of the return = 1 byte;                      Command ID to ACK = 0x01;                      Return = 0x00 (OK);                      Checksum = 0x56</p>	





**2 -0x02 - Request the revision identification**

<b>ID</b>	0x02		
<b>Description</b>	Request revision numbers of hardware, COACH, Sensor, and HCE Parameter: N/A		
<b>ID Command</b>	0xaa 00 02 56 aa		
<b>Parameter command</b>	N/A		
<b>Operation Mode</b>	Preview/playback mode		
<b>Return from the JPEG Module</b>	0xY <sub>15</sub> Y <sub>14</sub> Y <sub>13</sub> Y <sub>12</sub> Y <sub>11</sub> Y <sub>10</sub> Y <sub>9</sub> Y <sub>8</sub> Y <sub>7</sub> Y <sub>6</sub> Y <sub>5</sub> Y <sub>4</sub> Y <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> Y <sub>15</sub> Y <sub>14</sub> Y <sub>13</sub> Y <sub>12</sub> : Hardware Version Y <sub>11</sub> Y <sub>10</sub> Y <sub>9</sub> Y <sub>8</sub> : Coach Version Y <sub>7</sub> Y <sub>6</sub> : Sensor Version Y <sub>5</sub> Y <sub>4</sub> : xx Y <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> : HCE Version / 0x01: Failed		
<p>Example: Request the revision numbers of the hardware, COACH, Sensor, and HCE</p> <table> <tr> <td>Host: 0xaa 00 02 56 aa Wait for Response</td> <td>Module: 0xaa 08 02 62 b0 03 9e 08 03 01 08 1c aa # Length of the return = 8 bytes; Command ID to ACK = 0x02; Return = 0x0702 (Hardware ver.)           0x039e (COACH Ver.), 0x08 (Sensor Ver.),           xx, 0x0108 (HCE Ver.); Checksum = 0x1c</td> </tr> </table>		Host: 0xaa 00 02 56 aa Wait for Response	Module: 0xaa 08 02 62 b0 03 9e 08 03 01 08 1c aa # Length of the return = 8 bytes; Command ID to ACK = 0x02; Return = 0x0702 (Hardware ver.) 0x039e (COACH Ver.), 0x08 (Sensor Ver.), xx, 0x0108 (HCE Ver.); Checksum = 0x1c
Host: 0xaa 00 02 56 aa Wait for Response	Module: 0xaa 08 02 62 b0 03 9e 08 03 01 08 1c aa # Length of the return = 8 bytes; Command ID to ACK = 0x02; Return = 0x0702 (Hardware ver.) 0x039e (COACH Ver.), 0x08 (Sensor Ver.), xx, 0x0108 (HCE Ver.); Checksum = 0x1c		

**3 - 0x03 -Set the system clock**

<b>ID</b>	0x03
<b>Description</b>	Set the system clock Parameter: Year (2 bytes), Month (1 byte), Day (1 byte), Hour (1 byte), Minute (1 byte) and Second (1 byte)
<b>ID Command</b>	0xaa 07 03 5e aa
<b>Parameter command</b>	0xaa Y <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> M <sub>1</sub> M <sub>0</sub> D <sub>1</sub> D <sub>0</sub> H <sub>1</sub> H <sub>0</sub> M <sub>i1</sub> M <sub>i0</sub> S <sub>1</sub> S <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Y <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> : Year (in hex) M <sub>1</sub> M <sub>0</sub> : Month (in hex) D <sub>1</sub> D <sub>0</sub> : Day (in hex) H <sub>1</sub> H <sub>0</sub> : Hour (in hex) M <sub>i1</sub> M <sub>i0</sub> : Minutes (in hex) S <sub>1</sub> S <sub>0</sub> : Second (in hex) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	Preview/playback mode
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed /
<p>Example: Set the system clock to 2004/11/19 18:10:00</p>	



Host: 0xaa 07 03 5e aa 0xaa 07 d4 0b 13 12 0a 00 69 aa Wait for OK	Module: 0xaa 01 03 00 58 aa # Length of the return = 1 byte; Command ID to ACK = 0x03; Return = 0x00 (OK) Checksum = 0x58
-----------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------

**4 – 0x04 – Request the system time**

<b>ID</b>	0x04
<b>Description</b>	Request the system time Parameter: N/A
<b>ID Command</b>	0xaa 00 04 58 aa
<b>Parameter command</b>	N/A
<b>Operation Mode</b>	Preview/playback mode
<b>Return from the JPEG Module</b>	0xY <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> M <sub>1</sub> M <sub>0</sub> D <sub>1</sub> D <sub>0</sub> H <sub>1</sub> H <sub>0</sub> M <sub>i1</sub> M <sub>i0</sub> S <sub>1</sub> S <sub>0</sub> 0xY <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> : Year (in hex) 0xM <sub>1</sub> M <sub>0</sub> : Month (in hex) 0xD <sub>1</sub> D <sub>0</sub> : Day (in hex) 0xH <sub>1</sub> H <sub>0</sub> : Hour (in hex) M <sub>i1</sub> M <sub>i0</sub> : Minutes (in hex) S <sub>1</sub> S <sub>0</sub> : Second (in hex) / 0x01: Failed
Example: Request the system time Host: 0xaa 00 04 58 aa Wait for response	
Module: 0xaa 07 04 07 d5 04 0f 17 1e 05 81 aa # Length of the return = 7 bytes; Command ID to ACK = 0x04; Return = 0x07d5 (Year: 2005), 0x04 (Month: 04), 0x0f (Day: 15), 0x17 (Hour: 23), 0x1e (Minute: 30); 0x05 (Second: 05) (2005/04/15 23:30:05); Checksum = 0x81	

**6- 0x06 – Snapshot configuration**

<b>ID</b>	0x06
<b>Description</b>	Set the snapshot parameter Parameter: WhiteBalance Mode, EV, Contrast, ColorFff and Sharpness
<b>ID Command</b>	0xaa 05 06 5f aa



<b>Parameter command</b>	0xaa Z <sub>9</sub> Z <sub>8</sub> Z <sub>7</sub> Z <sub>6</sub> Z <sub>5</sub> Z <sub>4</sub> Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>9</sub> Z <sub>8</sub> : White Balance 0x00: Normal (Default),                      0x01: Day Light 0x02: Tungsten,                               0x03: Fluorescent, 0x04: Cloudy Z <sub>7</sub> Z <sub>6</sub> : EV 0x00 – 0x08 represent -2.0 – 2.0 in step of 0.5 (Default: 0x04) Z <sub>5</sub> Z <sub>4</sub> : Contrast 0x00: Normal (Default), 0x01: Stretch Z <sub>3</sub> Z <sub>2</sub> : Color Effect 0x00: Normal (Default), 0x01: B&W, 0x02: Sepia Z <sub>1</sub> Z <sub>0</sub> : Sharpness 0x00: Normal (Default), 0x01: Smooth, 0x02: Sharpen Ch <sub>1</sub> Ch <sub>0</sub> : Checksum												
<b>Operation Mode</b>	Preview/playback mode												
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed /												
<p>Example: Set daylight for White Balance, 0 for EV, normal for Contrast, B&amp;W for ColorEff, and Sharpen for sharpness</p> <table border="0"> <tr> <td>Host:</td> <td>Module:</td> </tr> <tr> <td>0xaa 05 06 5f aa</td> <td>0xaa 01 06 00 5b aa</td> </tr> <tr> <td>0xaa 01 04 00 01 02 5c aa</td> <td># Length of the return = 1 byte;</td> </tr> <tr> <td>Wait for OK</td> <td>Command ID to ACK = 0x06;</td> </tr> <tr> <td></td> <td>Return = 0x00 (OK);</td> </tr> <tr> <td></td> <td>Checksum = 0x5b</td> </tr> </table>		Host:	Module:	0xaa 05 06 5f aa	0xaa 01 06 00 5b aa	0xaa 01 04 00 01 02 5c aa	# Length of the return = 1 byte;	Wait for OK	Command ID to ACK = 0x06;		Return = 0x00 (OK);		Checksum = 0x5b
Host:	Module:												
0xaa 05 06 5f aa	0xaa 01 06 00 5b aa												
0xaa 01 04 00 01 02 5c aa	# Length of the return = 1 byte;												
Wait for OK	Command ID to ACK = 0x06;												
	Return = 0x00 (OK);												
	Checksum = 0x5b												

**30– 0x1e – Select the operation mode**

<b>ID</b>	0x1e
<b>Description</b>	Select the operation mode Parameter: Idle Mode: For downloading and reviewing pictures and videos / Capture JPG (Default): Capture still picture(s) when receiving the snapshot command / Capture AVI: Capture a video when receiving the record command / Playback: Playback the taken pictures and video
<b>ID Command</b>	0xaa 01 1e 73 aa



<b>Parameter command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Operation Mode 0x03: Idle, 0x04: Capture JPG, 0x05: Capture AVI, 0x06: Playback Ch <sub>1</sub> Ch <sub>0</sub> : Checksum		
<b>Operation Mode</b>	Preview/playback mode		
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode		
<p>Example: Select IDLE as the operation mode</p> <table> <tr> <td>Host: 0xaa 01 1e 73 aa 0xaa 03 57 aa Wait for OK</td> <td>Module: 0xaa 01 1e 00 73 aa # Length of the return = 1 byte; Command ID to ACK = 0x07; Return = 0x00 (OK); Checksum = 0x5c</td> </tr> </table>		Host: 0xaa 01 1e 73 aa 0xaa 03 57 aa Wait for OK	Module: 0xaa 01 1e 00 73 aa # Length of the return = 1 byte; Command ID to ACK = 0x07; Return = 0x00 (OK); Checksum = 0x5c
Host: 0xaa 01 1e 73 aa 0xaa 03 57 aa Wait for OK	Module: 0xaa 01 1e 00 73 aa # Length of the return = 1 byte; Command ID to ACK = 0x07; Return = 0x00 (OK); Checksum = 0x5c		

**31 – 0x1f – Request the current operation mode**

<b>ID</b>	0x1f		
<b>Description</b>	Request the current operation mode Parameter: N/A		
<b>ID Command</b>	0xaa 00 1f 73 aa		
<b>Parameter command</b>	N/A		
<b>Operation Mode</b>	All modes		
<b>Return from the JPEG Module</b>	0x01: Failed / 0x02: USB Mode: Connected with the host through the USB port / 0x03: Idle Mode: Perform no function / 0x04: Capture JPG: Capture still picture(s) when receiving the snapshot command / 0x05: Capture AVI: Capture a video when receiving the record command / 0x06: Playback: Playback the taken pictures and video		
<p>Example: Request the current operation mode</p> <table> <tr> <td>Host: 0xaa 00 1f 73 aa Wait for Response</td> <td>Module: 0xaa 01 1f 05 79 aa # Length of the return = 1 byte; Command ID to ACK = 0x1f; Return = 0x05 (Mode: Capture AVI); Checksum = 0x79</td> </tr> </table>		Host: 0xaa 00 1f 73 aa Wait for Response	Module: 0xaa 01 1f 05 79 aa # Length of the return = 1 byte; Command ID to ACK = 0x1f; Return = 0x05 (Mode: Capture AVI); Checksum = 0x79
Host: 0xaa 00 1f 73 aa Wait for Response	Module: 0xaa 01 1f 05 79 aa # Length of the return = 1 byte; Command ID to ACK = 0x1f; Return = 0x05 (Mode: Capture AVI); Checksum = 0x79		

**50 – 0x32 – Set the picture resolution and the compression ratio**

<b>ID</b>	0x32
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<b>Description</b>	Set the picture resolution and the compression ratio Parameter: Resolution: 1280*960/640*480 Compression ratio: 1x—45x(Default: 30x)
<b>ID Command</b>	0xaa 02 32 88 aa
<b>Parameter command</b>	0xaa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>3</sub> Z <sub>2</sub> : Resolution 0x00: 1280x 960, 0x01: 640 x 480 Z <sub>1</sub> Z <sub>0</sub> : Compression ratio 0x00 – 0x2c for 1x – 45x (Default: 0x18) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	All modes
<b>Return from the JPEG Module</b>	0x00: OK/ 0x01: Failed/ 0x02: USB mode
<p>Example: Set 1280*960 for the picture resolution and 45x for the compression ratio</p> <p>Host: 0xaa 02 32 88 aa 0xaa 00 2c 80 aa Wait for OK</p> <p>Module: 0xaa 01 32 00 87 aa # Length of the return = 1 byte; Command ID to ACK = 0x32; Return = 0x00 (OK); Checksum = 0x87</p>	

**51 – 0x33 – Request the current Luminance**

<b>ID</b>	0x33
<b>Description</b>	Reuquest the current Luminance Parameter: N/A
<b>ID Command</b>	0xaa 00 33 87 aa
<b>Parameter command</b>	N/A
<b>Operation Mode</b>	Preview/playback mode
<b>Return from the JPEG Module</b>	0xZ <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> : Luminance / 0x01: Failed / 0x03: Mode error
<p>Example: Request the current Luminance</p> <p>Host: 0xaa 00 33 87 aa Wait for Response</p> <p>Module: 0xaa 02 33 00 0d 96 aa # Length of the return = 2 bytes; Command ID to ACK = 0x33; Return = 0x000d (Luminance: 0x000d); Checksum = 0x96</p>	



**53 – 0x35 – Data Time Stamping**

<b>ID</b>	0x35
<b>Description</b>	Stamp the date-time on the picture (note: NOT video clip) Parameter: Format (2 bits): The format of the date-time Corner (2 bits): Which corner to stamp the date-time Style (2 bits): The style of the date-time Enable (1 bit): Enable the function NC (1 bit): Must be "0"
<b>ID Command</b>	0xaa 01 35 8a aa
<b>Parameter Command</b>	0xaa 0bb7b6b5b4b3b2b1b0 0xCh1Ch0 aa b7b6: Format (2 bits) 00: yyyy mm dd, 01: yyyy/mm/dd, 10: dd/mm/yyyy, 11: mm/dd/yyyy b5b4: Corner (2 bits) 00: Bottom right, 01: Bottom left 10: Top right, 11: Top left b3b2: Style 00: Stamp only the date, 01: Stamp only the time 10: Stamp both the date and the time b1b0: Enable 00: Enable, 10: Disable Ch1Ch0: Checksum
<b>Operation Mode</b>	Preview mode
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed
<p>Example: Stamp the data in the format of dd/mm/yyyy and the time on the bottom right of the current picture</p> <p>Host: <code>0xaa 01 35 8a aa</code>  <code>0xaa 88 dc aa</code>                  Wait for OK</p> <p>Module:  <code>0xaa 01 35 00 8a aa</code>                  # Length of the return = 1 byte;                  Command ID to ACK = 0x35;                  Return = 0x00 (OK);                  Checksum = 0x8a</p>	

**54 – 0x36 – String Stamping**

<b>ID</b>	0x36
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<b>Description</b>	Stamp a string on the picture, (NOT for video clip). This string will not see on the preview screen, only on the photo when play back. Parameter: Enable (1 byte): Enable the function FontW (1 byte):Width of the font(s) FontH (1 byte): Height of the font(s) PosX (2 bytes): X coordinate of the string (from left to right) PosY (2 bytes): Y coordinate of the string (from top to bottom) Red (1 byte): Red component of the RGB value Green (1 byte): Green component of the RGB value Blue (1 byte): Blue component of the RGB value StringLength (1 byte): Number of characters in the string (max 11) String (at most 11 bytes): ASCII code of the characters to display												
<b>ID Command</b>	0xaa N <sub>1</sub> N <sub>0</sub> 36 Ch <sub>1</sub> Ch <sub>0</sub> aa N <sub>1</sub> N <sub>0</sub> : Number of parameters Ch <sub>1</sub> Ch <sub>0</sub> : Checksum												
<b>Parameter Command</b>	0xaa Z <sub>21</sub> Z <sub>20</sub> Z <sub>19</sub> Z <sub>18</sub> Z <sub>17</sub> Z <sub>16</sub> Z <sub>15</sub> Z <sub>14</sub> Z <sub>13</sub> Z <sub>12</sub> Z <sub>11</sub> Z <sub>10</sub> Z <sub>9</sub> Z <sub>8</sub> Z <sub>7</sub> Z <sub>6</sub> Z <sub>5</sub> Z <sub>4</sub> Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> (String) Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>21</sub> Z <sub>20</sub> : 0x00: Enable, 0x01: Disable Z <sub>19</sub> Z <sub>18</sub> : 0x00 – 0xff –width of the font Z <sub>17</sub> Z <sub>16</sub> : 0x00 – 0xff – height of the font Z <sub>15</sub> Z <sub>14</sub> Z <sub>13</sub> Z <sub>12</sub> : 0x00 – X coordinate of string Z <sub>11</sub> Z <sub>10</sub> Z <sub>9</sub> Z <sub>8</sub> : 0x00 – Y coordinate of string Z <sub>7</sub> Z <sub>6</sub> : 0x00 – 0xff -Red Z <sub>5</sub> Z <sub>4</sub> : 0x00 – 0xff -Green Z <sub>3</sub> Z <sub>2</sub> : 0x00 – 0xff -Blue Z <sub>1</sub> Z <sub>0</sub> : 0x01 – 0x0b –string length (max 11) (String): ASCII code of the characters to display, only capital letter is active Ch <sub>1</sub> Ch <sub>0</sub> : Checksum												
<b>Operation Mode</b>	Preview/playback mode												
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed												
<p>Example: Stamp the string "HELLO" of that the font size is (W:80, H:90) and the RGB ratio is(0:0:255) at the (160, 150) of the picture</p> <table border="0"> <tr> <td>Host:</td> <td>Module:</td> </tr> <tr> <td>0xaa 10 36 9a aa</td> <td>0xaa 01 36 00 8b aa</td> </tr> <tr> <td>0x aa 00 50 5a 00 a0 00 96 00 00 ff 05 48 45 4c 4c</td> <td># Length of the return = 1 byte;</td> </tr> <tr> <td>4f ac aa</td> <td>Command ID to ACK = 0x36;</td> </tr> <tr> <td>Wait for Ok</td> <td>Return = 0x00 (OK);</td> </tr> <tr> <td></td> <td>Checksum = 0x8b</td> </tr> </table>		Host:	Module:	0xaa 10 36 9a aa	0xaa 01 36 00 8b aa	0x aa 00 50 5a 00 a0 00 96 00 00 ff 05 48 45 4c 4c	# Length of the return = 1 byte;	4f ac aa	Command ID to ACK = 0x36;	Wait for Ok	Return = 0x00 (OK);		Checksum = 0x8b
Host:	Module:												
0xaa 10 36 9a aa	0xaa 01 36 00 8b aa												
0x aa 00 50 5a 00 a0 00 96 00 00 ff 05 48 45 4c 4c	# Length of the return = 1 byte;												
4f ac aa	Command ID to ACK = 0x36;												
Wait for Ok	Return = 0x00 (OK);												
	Checksum = 0x8b												

**56 – 0x38 – Sequence capture**

<b>ID</b>	0x38
<b>Description</b>	Capture a number of pictures (not for video clip) Parameter: Number of picture(s) ( 1 byte)
<b>ID Command</b>	0xaa 01 38 8d aa





<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Number of picture(s) 0x01 – 0xff Ch <sub>1</sub> Ch <sub>0</sub> : Checksum												
<b>Operation Mode</b>	capture mode												
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode / 0x03: Mode error / 0x04: Memory full(RAM) / 0x05: Memory full (Flash) / 0x06: External memory card write-protect												
<p>Example: Set to take a chain of 5 pictures with a single snapshot</p> <table border="0"> <tr> <td>Host:</td> <td>Module:</td> </tr> <tr> <td>aa 01 1e 73 aa</td> <td>0xaa 01 38 00 8c aa</td> </tr> <tr> <td>aa 04 58 aa</td> <td># Length of the return = 1 byte;</td> </tr> <tr> <td>0xaa 01 38 8d aa</td> <td>Command ID to ACK = 0x38;</td> </tr> <tr> <td>0xaa 05 59 aa</td> <td>Return = 0x00 (OK);</td> </tr> <tr> <td>Wait for OK</td> <td>Checksum = 0x8d</td> </tr> </table>		Host:	Module:	aa 01 1e 73 aa	0xaa 01 38 00 8c aa	aa 04 58 aa	# Length of the return = 1 byte;	0xaa 01 38 8d aa	Command ID to ACK = 0x38;	0xaa 05 59 aa	Return = 0x00 (OK);	Wait for OK	Checksum = 0x8d
Host:	Module:												
aa 01 1e 73 aa	0xaa 01 38 00 8c aa												
aa 04 58 aa	# Length of the return = 1 byte;												
0xaa 01 38 8d aa	Command ID to ACK = 0x38;												
0xaa 05 59 aa	Return = 0x00 (OK);												
Wait for OK	Checksum = 0x8d												

**81 – 0x51 – Set the resolution and the compression ratio for AVI**

<b>ID</b>	0x51												
<b>Description</b>	Set the resolution and the compression ratio for AVI Resolution: 320 x 240 (Default) / 640 x 480 Compression ratio: 1x – 45x (Default: 30x)												
<b>ID Command</b>	0xaa 02 51 a7 aa												
<b>Parameter Command</b>	0xaa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>3</sub> Z <sub>2</sub> : Resolution 0x00: 320 x 240 (Default), 0x01: 640 x 480 Z <sub>1</sub> Z <sub>0</sub> : Compression ratio 0x00 – 0x2c for 1x – 45x (Default: 0x1d) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum												
<b>Operation Mode</b>	Preview/playback mode												
<b>Return from the JPEG Module</b>	0x00 : OK/ 0x01: failed												
<p>Example: Set 320*240 for the resolution and 20x for the compression ration of the video</p> <table border="0"> <tr> <td>Host:</td> <td>Module:</td> </tr> <tr> <td>0xaa 02 51 a7 aa</td> <td>0xaa 01 51 00 a6 aa</td> </tr> <tr> <td>0xaa 00 13 67 aa</td> <td># Length of the return = 1 byte;</td> </tr> <tr> <td>Wait for OK</td> <td>Command ID to ACK = 0x51;</td> </tr> <tr> <td></td> <td>Return = 0x00 (OK);</td> </tr> <tr> <td></td> <td>Checksum = 0xa6</td> </tr> </table>		Host:	Module:	0xaa 02 51 a7 aa	0xaa 01 51 00 a6 aa	0xaa 00 13 67 aa	# Length of the return = 1 byte;	Wait for OK	Command ID to ACK = 0x51;		Return = 0x00 (OK);		Checksum = 0xa6
Host:	Module:												
0xaa 02 51 a7 aa	0xaa 01 51 00 a6 aa												
0xaa 00 13 67 aa	# Length of the return = 1 byte;												
Wait for OK	Command ID to ACK = 0x51;												
	Return = 0x00 (OK);												
	Checksum = 0xa6												

**84 – 0x54 – Start/Stop recording AVI**

<b>ID</b>	0x54
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<b>Description</b>	Start / Stop recording AVI Parameter: Start / Stop																								
<b>ID Command</b>	Aa 01 54 a9 aa																								
<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Start / Stop 0x00: Start, 0x01: Stop Ch <sub>1</sub> Ch <sub>0</sub> : Checksum																								
<b>Operation Mode</b>	AVI capture mode																								
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode/ 0x03: Mode error / 0x04: Memory full(RAM) / 0x05: Memory full (Flash) / 0x06: External memory card write-protect																								
<p>Example: Start recording AVI</p> <table border="0"> <tr> <td>Host:</td> <td>Module:</td> </tr> <tr> <td>aa 01 1e 73 aa</td> <td>AA 01 54 00 A9 AA</td> </tr> <tr> <td>aa 05 59 aa</td> <td># Length of the return = 1 byte;</td> </tr> <tr> <td>aa 01 54 a9 aa</td> <td>Command ID to ACK = 0x54;</td> </tr> <tr> <td>0xaa 00 54 aa</td> <td>Return = 0x00 (OK);</td> </tr> <tr> <td>Wait for OK</td> <td>Checksum = 0x A9</td> </tr> </table> <p>Stop recording AVI</p> <table border="0"> <tr> <td>Host:</td> <td>Module:</td> </tr> <tr> <td>Aa 01 54 a9 aa</td> <td>AA 01 54 00 A9 AA</td> </tr> <tr> <td>0xaa 01 55 aa</td> <td># Length of the return=1byte;</td> </tr> <tr> <td>Wait for OK</td> <td>Command ID to ACK=0x54</td> </tr> <tr> <td></td> <td>Return=0x00(OK)</td> </tr> <tr> <td></td> <td>Checksum=0xA9</td> </tr> </table>		Host:	Module:	aa 01 1e 73 aa	AA 01 54 00 A9 AA	aa 05 59 aa	# Length of the return = 1 byte;	aa 01 54 a9 aa	Command ID to ACK = 0x54;	0xaa 00 54 aa	Return = 0x00 (OK);	Wait for OK	Checksum = 0x A9	Host:	Module:	Aa 01 54 a9 aa	AA 01 54 00 A9 AA	0xaa 01 55 aa	# Length of the return=1byte;	Wait for OK	Command ID to ACK=0x54		Return=0x00(OK)		Checksum=0xA9
Host:	Module:																								
aa 01 1e 73 aa	AA 01 54 00 A9 AA																								
aa 05 59 aa	# Length of the return = 1 byte;																								
aa 01 54 a9 aa	Command ID to ACK = 0x54;																								
0xaa 00 54 aa	Return = 0x00 (OK);																								
Wait for OK	Checksum = 0x A9																								
Host:	Module:																								
Aa 01 54 a9 aa	AA 01 54 00 A9 AA																								
0xaa 01 55 aa	# Length of the return=1byte;																								
Wait for OK	Command ID to ACK=0x54																								
	Return=0x00(OK)																								
	Checksum=0xA9																								

**100 – 0x64 – Select the storage media**

<b>ID</b>	0x64
<b>Description</b>	Setlect the storage media Parameter: Resident/external
<b>ID Command</b>	0xaa 01 64 b9 aa
<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Resident / external 0x00: Resident, 0x01: External Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	Preview mode
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode/ 0x50: Mode error

Example: Select the external memory as the storage media



<b>Host:</b> 0xaa 01 64 b9 aa 0xaa 01 55 aa Wait for OK	<b>Module:</b> 0xaa 01 64 00 b9 aa # Length of the return = 1 byte; Command ID to ACK = 0x64; Return = 0x00 (OK); Checksum = 0xb9
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**101 – 0x65 – Format the storage media**

<b>ID</b>	0x65		
<b>Description</b>	Format the storage media Parameter: Resident/external		
<b>ID Command</b>	0xaa 01 65 ba aa		
<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Resident / external 0x00: Resident, 0x01: External Ch <sub>1</sub> Ch <sub>0</sub> : Checksum		
<b>Operation Mode</b>	Preview mode		
<b>Return from the JPEG Module</b>	0x00 : ok/ 0x01: failed/ 0x02: USB mode/ 0x03: Mode error/ 0x06: External memory card write-protect		
<b>Example: Format the external memory</b> <table border="0"> <tr> <td><b>Host:</b> 0xaa 01 65 ba aa 0xaa 01 55 aa Wait for OK</td> <td><b>Module:</b> 0xaa 01 65 00 ba aa # Length of the return = 1 byte; Command ID to ACK = 0x65; Return = 0x00 (OK); Checksum = 0xba</td> </tr> </table>		<b>Host:</b> 0xaa 01 65 ba aa 0xaa 01 55 aa Wait for OK	<b>Module:</b> 0xaa 01 65 00 ba aa # Length of the return = 1 byte; Command ID to ACK = 0x65; Return = 0x00 (OK); Checksum = 0xba
<b>Host:</b> 0xaa 01 65 ba aa 0xaa 01 55 aa Wait for OK	<b>Module:</b> 0xaa 01 65 00 ba aa # Length of the return = 1 byte; Command ID to ACK = 0x65; Return = 0x00 (OK); Checksum = 0xba		

**102 – 0x66 – Request the information of the current storage media**

<b>ID</b>	0x66
<b>Description</b>	Request the information of the current storage media Parameter: N/A
<b>ID Command</b>	0xaa 00 66 ba aa
<b>Parameter Command</b>	N/A
<b>Operation Mode</b>	Preview/playback mode





<p>Host: 0xaa 02 78 ce aa          0xaa 00 02 56 aa          Wait for Response</p>	<p>Module: 0xaa 12 78 50 49 43 54 30 30 30 32 2e 4a 50 47 00 00 00 08 0f b2 ae aa          # Length of the return = 18 bytes;          Command ID to ACK = 0x78;          Return = 0x50494354303030322e4a50470000          (File name: PICT0002.JPG ),          0x00080fb2 (File size: 528306 bytes);          Checksum = 0x87</p> <p>Module: (For AVI file)          0xaa 14 78 50 49 43 54 30 30 30 32 2e 41 56 49 00 00 00 22 ef 80 00 06 83 aa          # Length of the return = 20 bytes;          Command ID to ACK = 0x78;          Return = 0x50494354303030322e4156490000          (File name: PICT0002.AVI ),          0x0022ef80 (File size: 2289536 bytes),          0x0006 (Video length: 6 seconds);          Checksum = 0x83</p>
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**121 - 0x79 – Download file from the JPEG Module(Function in IDLE mode ONLY)**

<b>ID</b>	0x79
<b>Description</b>	Download the targeted file from the Module (Function in IDLE mode ONLY) Parameter: File ID
<b>ID Command</b>	0xaa 02 79 cf aa
<b>Parameter Command</b>	0xaa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> : File ID 0x0000 – 0xffff (The upper limit depend on the memory size) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	Idle mode
<b>Return from the JPEG Module</b>	0xY <sub>35</sub> Y <sub>34</sub> Y <sub>33</sub> Y <sub>32</sub> Y <sub>31</sub> Y <sub>30</sub> Y <sub>29</sub> Y <sub>28</sub> Y <sub>27</sub> Y <sub>26</sub> Y <sub>25</sub> Y <sub>24</sub> Y <sub>23</sub> Y <sub>22</sub> Y <sub>21</sub> Y <sub>20</sub> Y <sub>19</sub> Y <sub>18</sub> Y <sub>17</sub> Y <sub>16</sub> Y <sub>15</sub> Y <sub>14</sub> Y <sub>13</sub> Y <sub>12</sub> Y <sub>11</sub> Y <sub>10</sub> Y <sub>9</sub> Y <sub>8</sub> Y <sub>7</sub> Y <sub>6</sub> Y <sub>5</sub> Y <sub>4</sub> Y <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> Y <sub>35</sub> Y <sub>34</sub> Y <sub>33</sub> Y <sub>32</sub> Y <sub>31</sub> Y <sub>30</sub> Y <sub>29</sub> Y <sub>28</sub> : File size Y <sub>27</sub> Y <sub>26</sub> Y <sub>25</sub> Y <sub>24</sub> : Number of packets Y <sub>23</sub> Y <sub>22</sub> Y <sub>21</sub> Y <sub>20</sub> Y <sub>19</sub> Y <sub>18</sub> Y <sub>17</sub> Y <sub>16</sub> Y <sub>15</sub> Y <sub>14</sub> Y <sub>13</sub> Y <sub>12</sub> Y <sub>11</sub> Y <sub>10</sub> Y <sub>9</sub> Y <sub>8</sub> Y <sub>7</sub> Y <sub>6</sub> Y <sub>5</sub> Y <sub>4</sub> Y <sub>3</sub> Y <sub>2</sub> Y <sub>1</sub> Y <sub>0</sub> : File name / 0x01: Failed / 0x02: USB mode / 0x03: Mode error / 0x09: File does not exist

Example: Download the file of that the ID is 3 from the JPEG Module



Host: aa 01 1e 73 aa aa 03 57 aa 0xaa 02 79 cf aa 0xaa 00 02 56 aa Wait for Response	Module: 0xaa 12 79 00 1a 7d 6e 00 1d 50 49 43 54 30 30 30 33 2e 41 56 49 02 aa # Length of the return = 18 bytes; Command ID to ACK = 0x79; Return = 0x001a7d6e (File size: 1736046 bytes), 0x001d (Number of packets: 29), 0x50494354303030332e415649 (File name: PICT0003.AVI); Checksum = 0x02
Host: (ACK) 0xaa 01 79 00 ce aa Wait for Packet 0001	Module: 0xaa 00 01 (File data: 61434 bytes) (checksum: 2 bytes) aa (Packet total size: 0xf000 = 61440 bytes)
Host: (ACK) 0xaa 01 79 00 ce aa Wait for Packet 0002	Module: 0xaa 00 02 (File data: 61434 bytes) (checksum: 2 bytes) aa (Packet total size: 0xf000 = 61440 bytes) ...
Host: (ACK) 0xaa 01 79 00 ce aa Wait for Packet 0003 ...	Module: 0xaa 00 1d (File data: 15894 bytes) (checksum: 2 bytes) aa (Packet total size: 0xf000 = 15900 bytes)
Host: (ACK) 0xaa 01 79 00 ce aa Download Completed	

**122 - 0x7a – Delete the targeted file**

<b>ID</b>	0x7a
<b>Description</b>	Delete the targeted file Parameter: File ID
<b>ID Command</b>	0xaa 02 7a d0 aa
<b>Parameter Command</b>	0xaa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> : File ID 0x0000 – 0xffff (The upper limit depend on the memory size) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	All modes
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode / 0x06: External memory card wirte-protect / 0x09: File does not exist
Example: Delete the file of that the ID is 3	
Host: 0xaa 02 7a d0 aa 0xaa 00 03 57 aa Wait for OK	Module: 0xaa 01 7a 00 cf aa # Length of the return = 1 byte; Command ID to ACK = 0x7a; Return = 0x00 (OK); Checksum = 0xcf

**155 – 0x9b – Select the YV Standard**

<b>ID</b>	0x9b
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<b>Description</b>	Select the TV Standard Parameter: NTSC/PAL
<b>ID Command</b>	0xaa 01 9b f0 aa
<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : NTSC / PAL 0x00: NTSC, 0x01: PAL (Default) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	All mode
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed
<p>Example: Select NTSC as the TV standard</p> <p>Host: 0xaa 01 9b f0 aa 0xaa 00 54 aa Wait for OK</p> <p>Module: 0xaa 01 9b 00 f0 aa # Length of the return = 1 byte; Command ID to ACK = 0x9b; Return = 0x00 (OK); Checksum = 0xf0</p>	

**159 – 0x9f – Select the Braud rate**

<b>ID</b>	0x9f
<b>Description</b>	Select the Baud rate Parameter: 115200/57600
<b>ID Command</b>	0xaa 01 9f f4 aa
<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Baud rate 0x04: 57600bps, 0x05: 115200bps (Default) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	All mode
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed
<p>Example: Select 115200bps for baud rate</p> <p>Host: 0xaa 01 9f f4 aa 0xaa 05 59 aa Wait for OK</p> <p>Module: 0xaa 01 9f 00 f4 aa # Length of the return = 1 byte; Command ID to ACK = 0x9f; Return = 0x00 (OK); Checksum = 0x5f</p>	

**169 – 0xa9 – Request the connection status of the external memory**

<b>ID</b>	0xa9
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<b>Description</b>	Request the connection status of the external memory Parameter: N/A		
<b>ID Command</b>	0xaa 00 a9 fd aa		
<b>Parameter Command</b>	N/A		
<b>Operation Mode</b>	All modes		
<b>Return from the JPEG Module</b>	0x06: External memory card write-protect / 0x07: Connect / 0x08: Disconnect		
<p>Example: Request the connection status of the external memory</p> <table> <tr> <td>Host: 0xaa 00 a9 fd aa Wait for Response</td> <td>Module: 0xaa 01 a9 07 05 aa # Length of the return = 1 byte; Command ID to ACK = 0xa9; Return = 0x07 (connect); Checksum = 0x05</td> </tr> </table>		Host: 0xaa 00 a9 fd aa Wait for Response	Module: 0xaa 01 a9 07 05 aa # Length of the return = 1 byte; Command ID to ACK = 0xa9; Return = 0x07 (connect); Checksum = 0x05
Host: 0xaa 00 a9 fd aa Wait for Response	Module: 0xaa 01 a9 07 05 aa # Length of the return = 1 byte; Command ID to ACK = 0xa9; Return = 0x07 (connect); Checksum = 0x05		

**176 – 0xb0 – Synchronization signal**

<b>ID</b>	0xb0						
<b>Description</b>	Send this command to the Module for synchronization until receiving "OK" Parameter: N/A						
<b>ID Command</b>	0xaa 00 b0 04 aa						
<b>Parameter Command</b>	N/A						
<b>Operation Mode</b>	All mode						
<b>Return from the JPEG Module</b>	0x00: OK						
<p>Example: Send a series of sychronization signal to the Module</p> <table> <tr> <td>Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)</td> <td>Module: No response</td> </tr> <tr> <td>Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)</td> <td>Module: No response ...</td> </tr> <tr> <td>Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)</td> <td>Module: 0xaa 01 b0 00 05 aa # Length of the return = 1 byte; Command ID to ACK = 0xb0; Return = 0x00 (OK); Checksum = 0x05</td> </tr> </table>		Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)	Module: No response	Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)	Module: No response ...	Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)	Module: 0xaa 01 b0 00 05 aa # Length of the return = 1 byte; Command ID to ACK = 0xb0; Return = 0x00 (OK); Checksum = 0x05
Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)	Module: No response						
Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)	Module: No response ...						
Host: 0xaa 00 b0 04 aa Wait for Response (10ms for 115200bps)	Module: 0xaa 01 b0 00 05 aa # Length of the return = 1 byte; Command ID to ACK = 0xb0; Return = 0x00 (OK); Checksum = 0x05						

**200 – 0xc8 – Playback the current AVI**

<b>ID</b>	0xc8
<b>Description</b>	Playback the current AVI Parameter: Play/Pause/Fast Forward/Backward
<b>ID Command</b>	0xaa 01 c8 1d aa



<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Playback operation 0x00: Play,                      0x01: Pause, 0x02: Stop,                      0x03: Fast Forward, 0x04: Backward h <sub>1</sub> Ch <sub>0</sub> : Checksum		
<b>Operation Mode</b>	Playback mode		
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode / 0x03: Mode error		
<p>Example: Play the current AVI</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">           Host:            0xaa 01 c8 1d aa            0xaa 00 54 aa            Wait for OK         </td> <td style="width: 50%; border: none;">           Module:            0xaa 01 c8 00 1d aa            # Length of the return = 1 byte;            Command ID to ACK = 0xc8;            Return = 0x00 (OK);            Checksum = 0x1d         </td> </tr> </table>		Host: 0xaa 01 c8 1d aa 0xaa 00 54 aa Wait for OK	Module: 0xaa 01 c8 00 1d aa # Length of the return = 1 byte; Command ID to ACK = 0xc8; Return = 0x00 (OK); Checksum = 0x1d
Host: 0xaa 01 c8 1d aa 0xaa 00 54 aa Wait for OK	Module: 0xaa 01 c8 00 1d aa # Length of the return = 1 byte; Command ID to ACK = 0xc8; Return = 0x00 (OK); Checksum = 0x1d		

**201 – 0xc9 – Select the previous/Next file**

<b>ID</b>	0xc9
<b>Description</b>	Select the Previous/Next file Parameter: Previous/Next
<b>ID Command</b>	0xaa 01 c9 1e aa
<b>Parameter Command</b>	0xaa Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>1</sub> Z <sub>0</sub> : Direction 0x00: Previous, 0x01: Next Ch <sub>1</sub> Ch <sub>0</sub> : Checksum
<b>Operation Mode</b>	Playback mode
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode/ 0x03: Mode error
<p>Example: Select the next file</p>	



<b>Host:</b> 0xaa 01 c9 1e aa 0xaa 01 55 aa Wait for OK	<b>Module:</b> 0xaa 01 c9 00 1e aa # Length of the return = 1 byte; Command ID to ACK = 0xc9; Return = 0x00 (OK); Checksum = 0x1e
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**202 – 0xca – Select a particular file**

<b>ID</b>	0xca		
<b>Description</b>	Select a particular file Parameter: File ID		
<b>ID Command</b>	0xaa 02 ca 20 aa		
<b>Parameter Command</b>	0xaa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> Ch <sub>1</sub> Ch <sub>0</sub> aa Z <sub>3</sub> Z <sub>2</sub> Z <sub>1</sub> Z <sub>0</sub> : File ID 0x0000 – 0xffff (The upper limit depend on the memory size) Ch <sub>1</sub> Ch <sub>0</sub> : Checksum		
<b>Operation Mode</b>	Playback mode		
<b>Return from the JPEG Module</b>	0x00: OK / 0x01: Failed / 0x02: USB mode		
Example: Select the file of that the ID is 20 <table border="1"> <tr> <td> <b>Host:</b>                      0xaa 02 ca 20 aa                      0xaa 00 14 68 aa                      Wait for OK                 </td> <td> <b>Module:</b>                      0xaa 01 ca 00 1f aa                      # Length of the return = 1 byte;                      Command ID to ACK = 0xca;                      Return = 0x00 (OK);                      Checksum = 0x1f                 </td> </tr> </table>		<b>Host:</b> 0xaa 02 ca 20 aa 0xaa 00 14 68 aa Wait for OK	<b>Module:</b> 0xaa 01 ca 00 1f aa # Length of the return = 1 byte; Command ID to ACK = 0xca; Return = 0x00 (OK); Checksum = 0x1f
<b>Host:</b> 0xaa 02 ca 20 aa 0xaa 00 14 68 aa Wait for OK	<b>Module:</b> 0xaa 01 ca 00 1f aa # Length of the return = 1 byte; Command ID to ACK = 0xca; Return = 0x00 (OK); Checksum = 0x1f		

附录

1.功能示例

a) Capture a JPEG

	Host	Module
1. synchronization	aa 00 b0 04 aa (repeat until module acks)	aa 01 b0 00 05 aa
2. select capture JPG Mode	aa 01 1e 73 aa aa 04 58 aa	- aa 01 1e 00 73
3. capture a JPG	aa 01 38 8d aa aa 01 55 aa	- aa 01 37 00 8d aa



b) Capture a video clip

	Host	Module
1. synchronization	aa 00 b0 04 aa (repeat until module acks)	aa 01 b0 aa 05 aa
2. select video mode	aa 01 1e 73 aa aa 05 59 aa	- aa 01 1e 00 73 aa
3. start video	aa 01 54 a9 aa aa 00 54 aa	- aa 01 54 00 a9 aa
4. stop video	aa 01 54 a9 aa aa 01 55 aa	- aa 01 54 00 a9 aa

c) Transmits a JPG to host

	Host	Module
1. synchronization	aa 00 b0 04 aa	aa 01 b0 00 05 aa
2. delect idle mode	aa 01 1e 73 aa aa 03 57 aa	- aa 01 1e 00 73 aa
3. select file #1 and transit	aa 02 79 cf aa aa 00 01 55 aa	- aa 12 79 00 01 df b3 00 02 50 49 43 54 30 30 32 2e 4a 50 47 75 aa (that mean it has 122803 byte, 2packets)
4. send ACK	aa 01 79 00 ce aa	aa 00 01 ff db ff e1 0a 6b 45 78... received first pack of the image data
5. seng ACK again	aa 01 79 00 ce aa	received another pack of the picture's data
6. completed	aa 01 79 00 ce aa	-

**2. ACSII 码表**

Dec	Hex	Character	077	04D	M
032	020	SP	078	04E	N
033	021	!	079	04F	O
034	022	"	080	050	P
035	023	#	081	051	Q
036	024	\$	082	052	R
037	025	%	083	053	S
038	026	&	084	054	T
039	027	'	085	055	U
040	028	(	086	056	V
041	029	)	087	057	W



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042	02A	*	088	058	X
043	02B	+	089	059	Y
044	02C	,	090	05A	Z
045	02D	-	091	05B	[
046	02E	.	092	05C	\
047	02F	/	093	05D	]
048	030	0	094	05E	^
049	031	1	095	05F	~
050	032	2	096	060	`
051	033	3	097	061	a
052	034	4	098	062	b
053	035	5	099	063	c
054	036	6	100	064	d
055	037	7	101	065	e
056	038	8	102	066	f
057	039	9	103	067	g
058	03A	:	104	068	h
059	03B	;	105	069	i
060	03C	<	106	06A	j
061	03D	=	107	06B	k
062	03E	>	108	06C	l
063	03F	?	109	06D	m
064	040	@	110	06E	n
065	041	A	111	06F	o
066	042	B	112	070	p
067	043	C	113	071	q
068	044	D	114	072	r
069	045	E	115	073	s
070	046	F	116	074	t
071	047	G	117	075	u
072	048	H	118	076	v
073	049	I	119	077	w
074	04A	J	120	078	x
075	04B	K	121	079	y
076	04C	L	122	07A	z