



# **LinkSprite JPEG Color Camera Serial UART Interface**

## **User Manual**

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**LinkSprite Technologies, Inc**

**[www.linksprite.com](http://www.linksprite.com)**

<b>Doc Title</b>	LinkSprite JPEG Color Camera Serial UART Interface User Manual	<b>Number</b>	LS-Y201
		<b>Version</b>	1.1

Version	Date	Description	Author
1.1	31/03/2012	The second edition	Nancy

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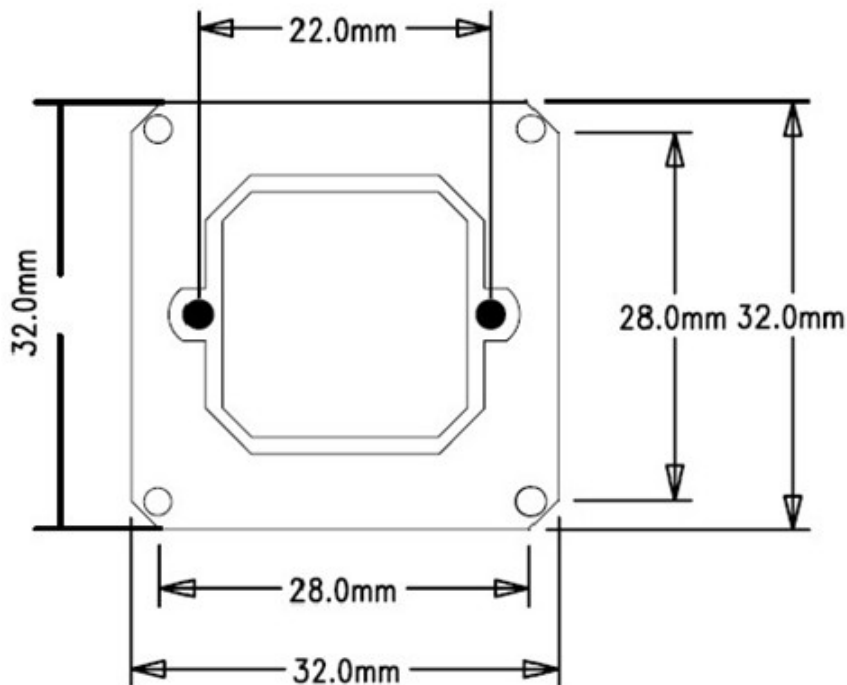
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## 1. Introduction

LS-Y201 is LinkSprite's new generation serial port camera module. It can captures high resolution pictures using the serial port. LS-Y201 is a modular design that outputs JPEG images through UART, and can be easily integrated into existing design.

## 2. Specification

- I VGA/QVGA/160\*120 resolution
- I Support capture JPEG from serial port
- I Default baud rate of serial port is 38400
- I DC 3.3V or 5V power supply
- I Size 32mm X 32mm
- I Current consumption: 80-100mA
- I Near the C03 pin is AV output, this is a analog output pin.



Footprint

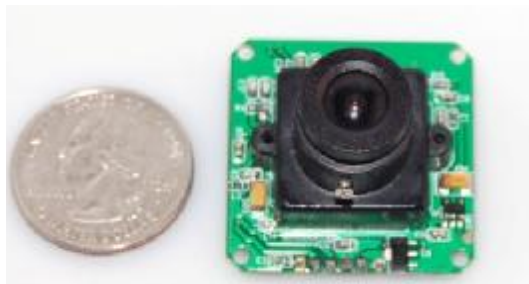
### 3. Application

- I Different image capture systems
- I Environmental monitoring
- I Industry monitoring
- I Medical equipment
- I Video phone
- I Security
- I Vehicle based GPS

### 4. Getting Started - TTL

#### 4.1 Hardware part

- I LS - Y201 – TTL camera



- I 5V DC power
- I UART-USB module



## 4.2 Hardware connection



- I LS - Y201 - TTL (TXD) to UART-USB (RXD).
- I LS - Y201 - TTL (RXD) to UART-USB (TXD).
- I LS - Y201 - TTL (GND) to UART-USB (GND). At the same time it also need to connect to GND in power.
- I LS - Y201 - TTL (VCC) to +5V DC power.
- I UART-USB module and DB9 needle connected to each, and DB9 hole connected to PC。

## 5. Getting Started——RS232

### 5.1 Hardware part

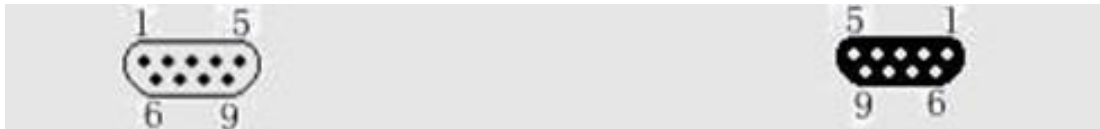
- I LS - Y201 - RS232 camera
- I 5V DC power
- I RS-232 serial cable (DB9 MALE/FEMALE)

## 5.2 Hardware connection

- I LS - Y201 - RS232 (TXD) to DB-9 MALE pin 2(RXD).
- I LS - Y201 - RS232 (RXD) to DB-9 MALE pin 3(TXD).
- I LS - Y201 - RS232 (GND) to DB-9 MALE pin 5(GND). At the same time it also need to connect to GND in power.
- I LS - Y201 - RS232 (VCC) to +5V DC power.

Note: If you are using DB-9(FEMALE), the 2 pin is TXD, the 3 pin is RXD.

DB-9 Pin definition



DB-9 MALE(Needle)

DB-9 FEMALE(Hole)

- I RS-232 (DB-9 FEMALE / Hole) Pin definition

Pin number:        2        3        5        1. 4. 6        7. 8

Signal definition: TXD   RXD   GND   Internal connected   Internal connected

Directly connect the COM port of PC

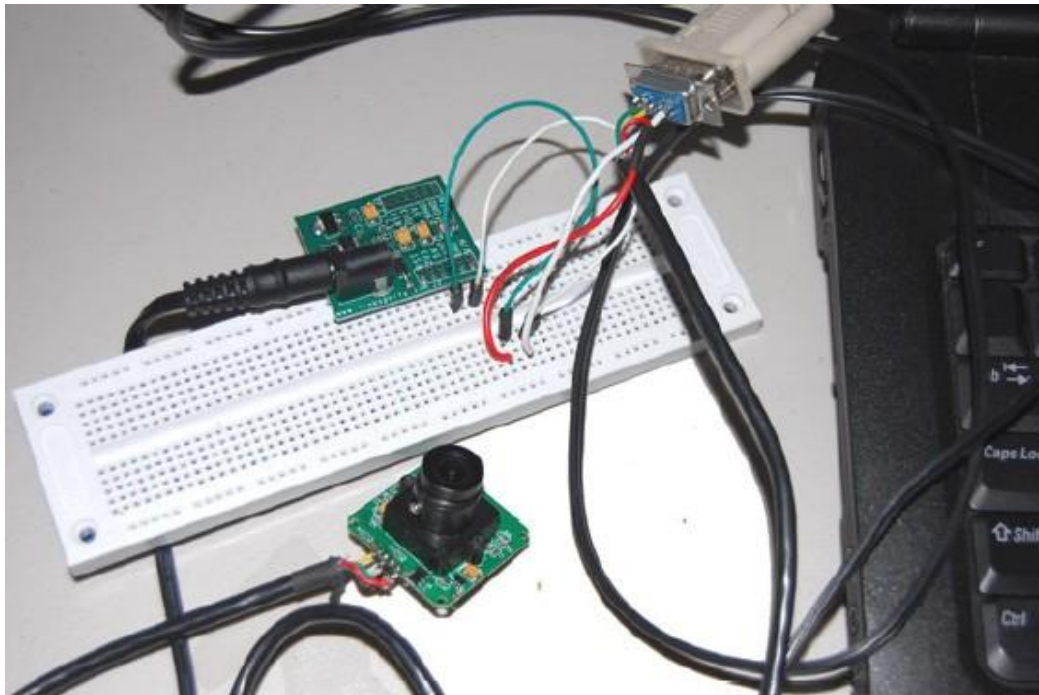
- I RS-232 (DB-9 MALE/ Needle) Pin definition

Pin number:        2        3        5        1. 4. 6        7. 8

Signal definition: RXD   TXD   GND   Internal connected   Internal connected

Directly connect the COM port of PC

### 5.3 Hardware connection



### 5.4 Software

I X-CTU Download Link: [www.digi.com](http://www.digi.com) (test software)

I Software:

<http://www.linksprite.com/download/showdownload.php?id=36&lang=en>

## 6. Test

### 6.1 Regular test

Power up information in X-CTU as the following ASCII:

Please note that the baud rate should be 38400.



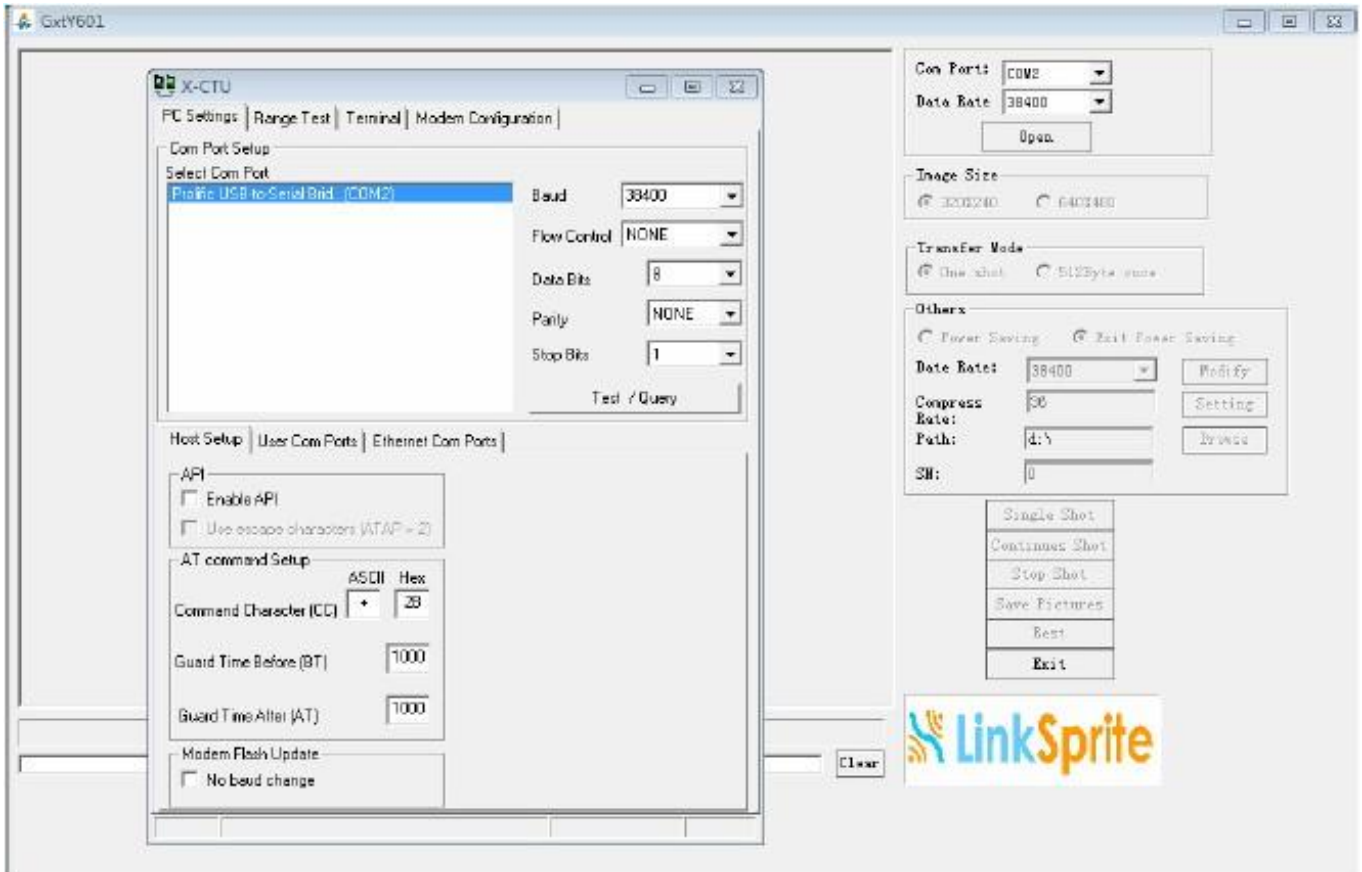


## 6.2 Software

Com Port: Choose the right Com Port。

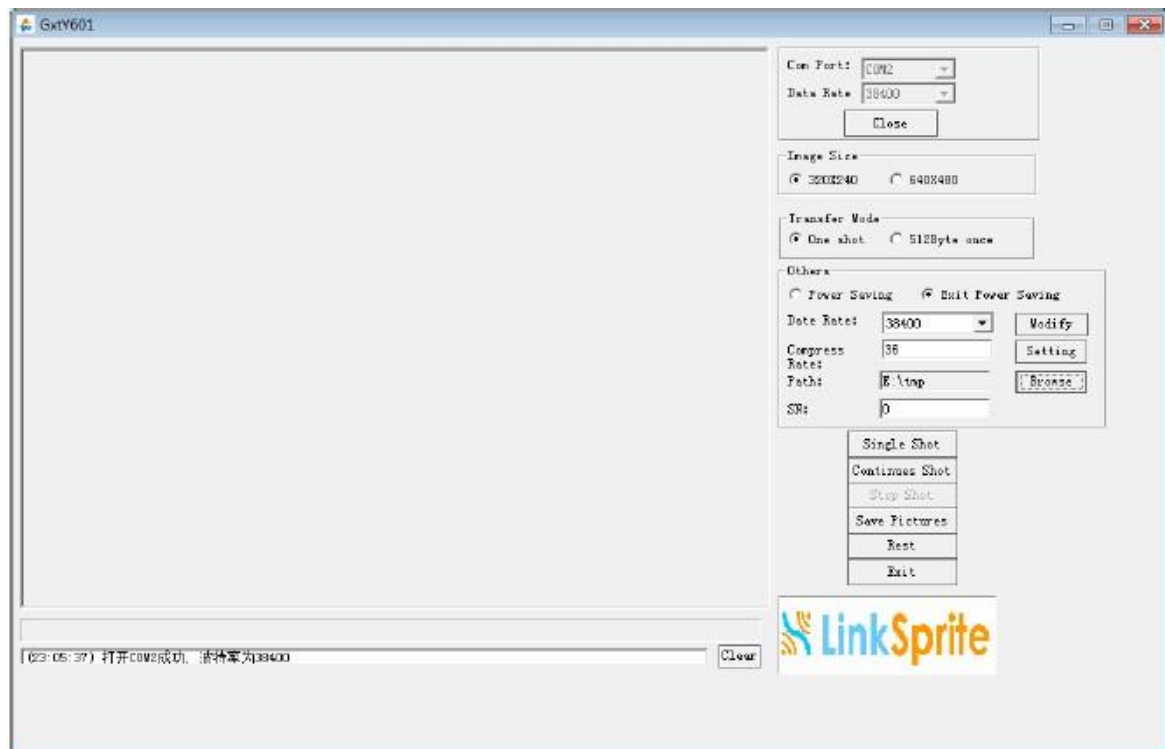
Data Port: Baud Rate settings, here it is 38400。

Click “Open” to open Com connection

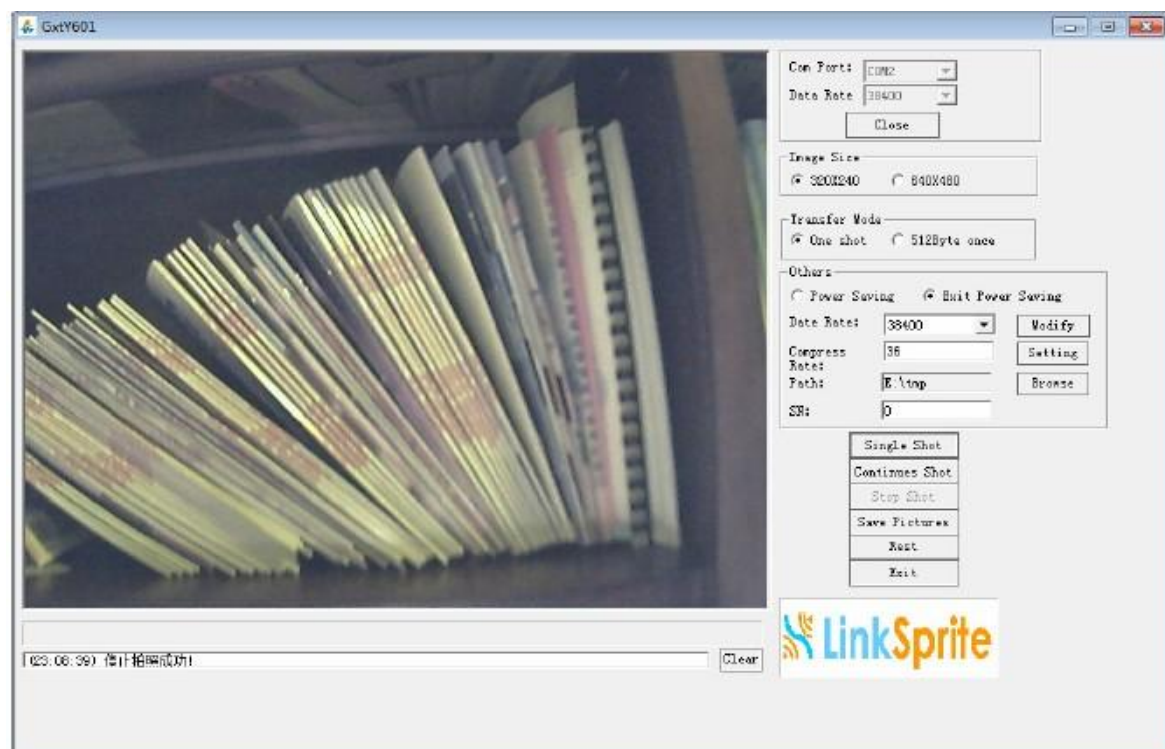


Path: Set the path for captured images. Please note that it is necessary to set the path, if it is a wrong path or not exist, then the picture may not be saved.

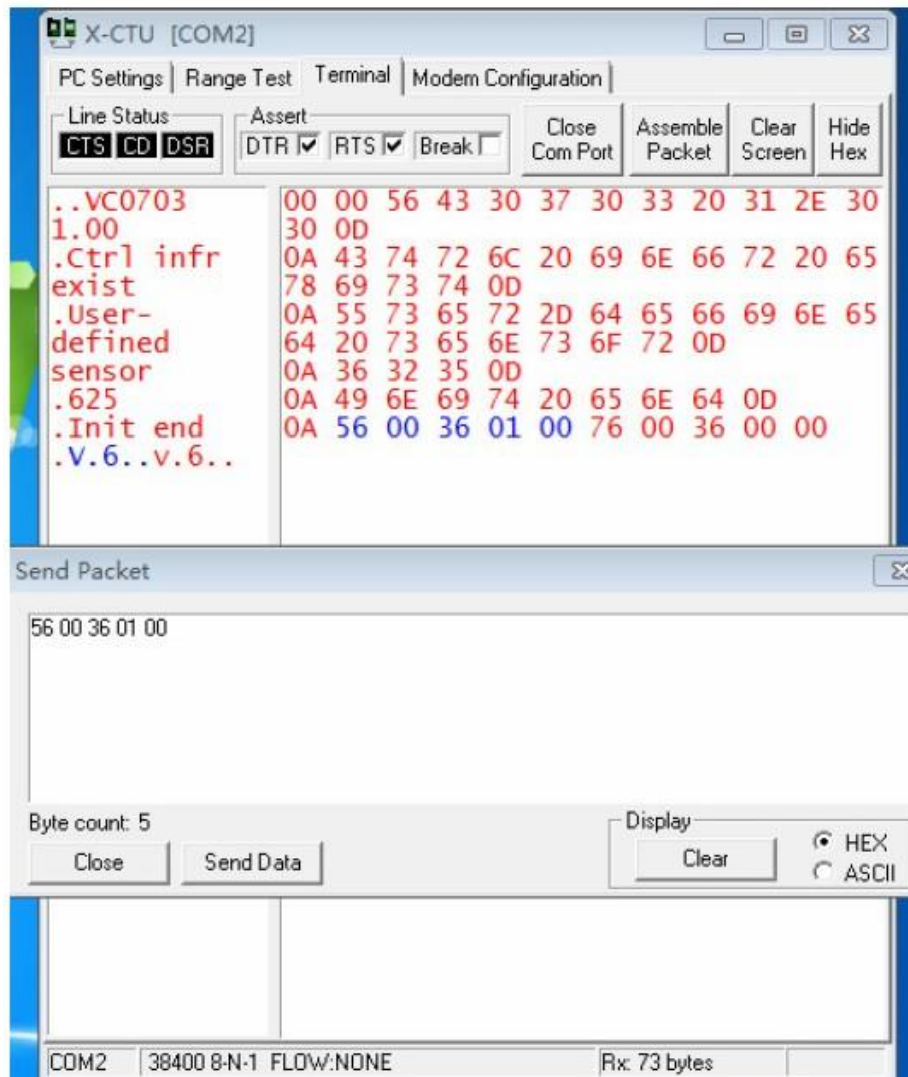
### 6.3 Test with software



Click “Single Shot”:



## 6.4 Test with X-CTU



Input HEX command in “Send Packet” and click “Send Data”, X-CTU will show the input command and return the information sent back by the camera.

## 7. Communication Protocol

### 7.1 Reset

Send: 56 00 26 00

Return: 76 00 26 00

## 7.2 Take picture

Send: 56 00 36 01 00

Return: 76 00 36 00 00

## 7.3 Read JPEG file size

Read length: 56 00 34 01 00

Return : 76 00 34 00 04 00 00 XH XL

XH XL is the length of the picture file, MSB in the front and LSB in the end.

## 7.4 Read JPEG file content

Read: 56 00 32 0C 00 0A 00 00 MM MM 00 00 KK KK XX XX

Return : 76 00 32 00 00 (Spacing Interval) FF D8    . . . . . (Spacing Interval)

76 00 32 00 00

(spacing interval) = XX    XX\*0.01ms

00   00   MM   MM   Init address

00   00   KK   KK   data length

MSB first, then LSB

Note: (Spacing Interval) = XX    XX\*0.01ms, it is better to be smaller, such as:

00 0A

JPEG file start from FF D8 end by FF D9.

To read Jpeg file, the start is always 0000, and read data block in integer multiple of 8 till it show FF D9 at the end.

## 7.5 Stop taking pictures

Stop : 56 00 36 01 03

Return : 76 00 36 00 00

## 7.6 Compression Ratio

Send: 56 00 31 05 01 01 12 04 XX

Return: 76 00 31 00 00

XX is usually 36, XX: 0X00 to 0XFF, XX is about Compression Ratio, the bigger it is, the more compressed of the picture.

## 7.7 Image size

Command 1 :

Send	Return
56 00 31 05 04 01 00 19 00 (640*480)	76 00 31 00 00
56 00 31 05 04 01 00 19 11 (320*240)	76 00 31 00 00
56 00 31 05 04 01 00 19 22 (160*120)	76 00 31 00 00

When changing the size, it needs to be reset or reconnect power, once it has been changed, the parameters will remain even disconnect power.

Command 2:

Send	Return
56 00 54 01 00 (640*480)	76 00 54 00 00
56 00 54 01 11 (320*240)	76 00 54 00 00
56 00 54 01 22 (160*120)	76 00 54 00 00

Do not disconnect or reset after sending the command, or it will turn back to 320\*240.

## 7.8 Power Saving

Send: 56 00 3E 03 00 01 01      Return : 76 00 3E 00 00

Quit Saving: 56 00 3E 03 00 01 00    Return: 76 00 3E 00 00

## 7.9 Changing Baud Rate

Send : 56 00 24 03 01 XX    XX

Return : 76 00 24 00 00

XX	XX	baud rate
AE	C8	9600
56	E4	19200
2A	F2	38400
1C	4C	57600
0D	A6	115200 (Max)

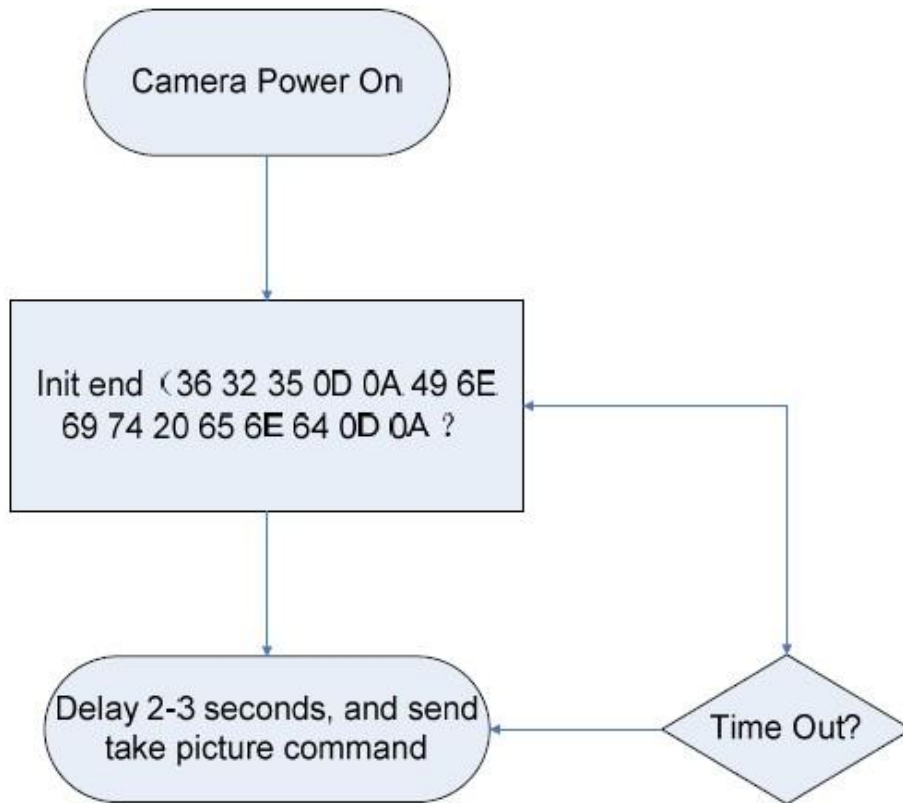
Please Note:

- I The starting read address must be the 8 integer multiples
- I For multiple cameras 56 XX 36 01 00, XX is the Device Number( Default is 00 )
- I UART is in RS232 level. If connect to the MCU, please add a level converter or remove the MAX3232 ic. RS232 level are used in the modules , UART communication distance can not be longer than 1m.
- I The serial port will show the below info when connect with power:  
  
Ctrl infr exist  
  
User-defined sensor  
  
625  
  
Init end
- I The host only have to make sure when to receive “Init end” (36 32 35 0D 0A 49

6E 69 74 20 65 6E 64 0D 0A) , then take the capture command in 2-3s.

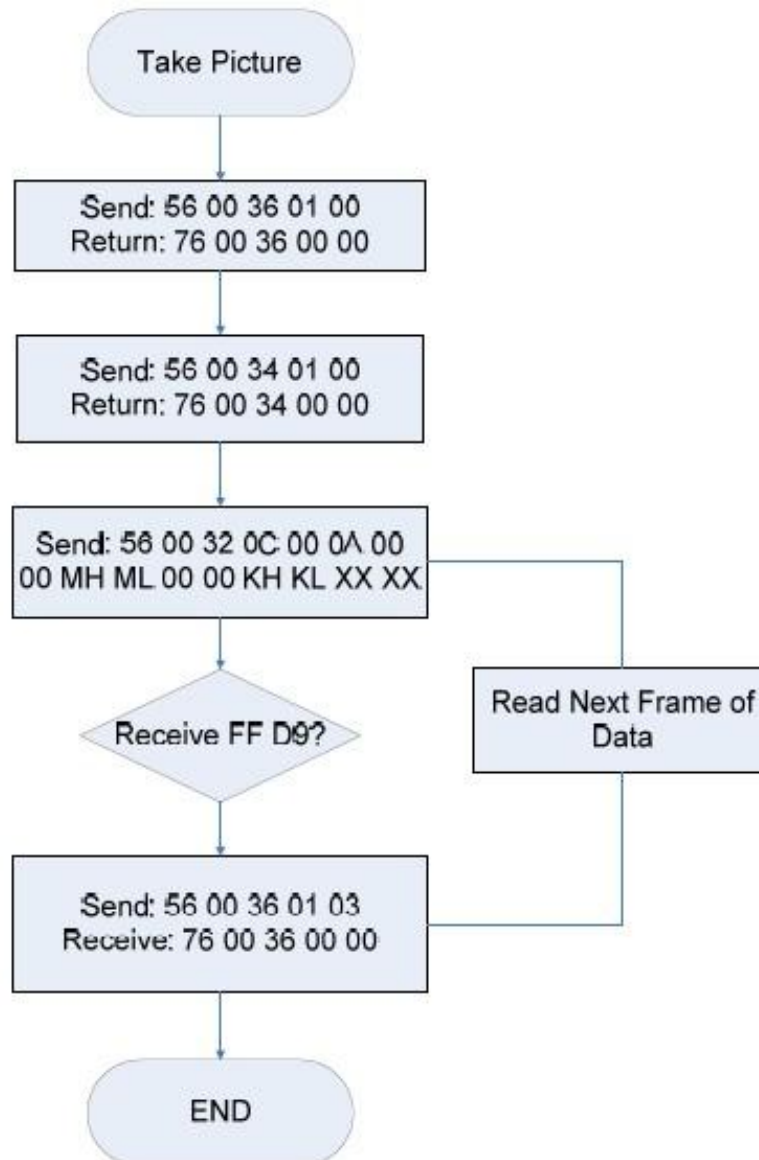
## 8. Program flow chart

### 8.1 Initialize





## 8.2 Take JPEG picture:



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