GL-Moto-Mini user manual

1. Introduction



Powered by Domino Core, GL-Moto-Mini is a Wi-Fi controller for R/C hobbies. Using your smartphone, you can control R/C cars, robots or even Helis easily. Plugin a UVC Webcam and you can have live video streaming to your smartphone.

The controller have 4-channel PWM output, USB-A, 4 LEDs, one Reset. It also have UART for both CPU and MCU and Ethernet port reserved for debugging.

You need to install it in your vehicle, as in this picture.



2. Hardware



2.1. MCU footprint

The footprint of the MCU is as attached. You can check how the MCU is connected to the interfaces of the board and how it is connected to CPU.



3. MCU Programming

You only need a USB-UART adapter to download the bin to the MCU.

3.1. Connection

You need a USB-UART adapter as this one or similar one.



You need to solder the wire to the MCU UART pins as illustrated below, then connect to your computer via the USB-UART adapter.



http://www.gl-inet.com/moto-mini

3.2. Compile the code

The code can be downloaded from our website. You can use Keil 4.0 to compile it. We are searching for an open source tool for compiling the source code.

3.3. Download program to your MCU

Download the MCU programming tools from our website. Unzip and run stc-isp-15xx-v6.85H.exe

Step1: Execute the program

You may need to change the UI to English if it is in Chinese.

🐊 STC-ISP (V6.85H) (Sales: 0513-55012928) Web:www.STCMCU.com (Support QQ:800003751) pc::RMB6000 STC: T 💶 💷 🗮 🌉										
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English Change to English Interf	Voltage(V)	ROM SRAM	EEPROM I/O	Timer	U. 🔺					
简体中文	2 5.5-3.8	8K 2048	53K 42	6						
Input IRC frequency 11.0592 ・ MHr ⑦ Oscillator high gain ⑦ Using fast download mode Next time can program only when P3.2 & P3 ⑦ Enable longer power-on-reset latency ⑦ Enable Low-Voltage reset LVD detect leve 3.82 V ・ ⑦ Inhibit EEPROM operation under Low-Voltag Hardware enable WDT after power-on-reset Watch-Dog-Timer prescal.256	2 5.5-3.8 115F2K252 5.5-3.8 115F2K452 5.5-3.8 115F2K4052 5.5-3.8 115F2K4052 5.5-3.8 115F2K6052 5.5-3.8 115F2K6052 5.5-3.8 115F2K6152 5.5-	16K 2048 24K 2048 32K 2048 40K 2048 46K 2048 56K 2048 60K 2048 61K 2048 61K 2048 62 57 2049	45K 42 37K 42 29K 42 21K 42 13K 42 5K 42 1K 42 1K 42 1AP 42 TAP 42	6 6 6 6 6 6 6						
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Step 2: Choose the correct MCU - IAP15W413AS

It is in the STC15W408AS series.

🗊 STC-ISP (V6.85H) (Sales: 0513-55012928) Web:www.STCMCU.com (Support QQ:800003751) pc::RMB6000 STC: T 💷 💷 🔤 🔤									
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Reload and download when target file is modified	elease Projec Rel	lease Help	Get HDD-SN		Beep	PassTi	mes O	Reset	

Step 3: Open the bin file

Click the "Open Code File" button and choose your bin file for MCU.



Step 4: Choose MCU crystal frequency – 22.1184Mhz

TC-ISP (V6.85H) (Sales: 0513-55012928) Web:www	.STCMCU.com	(Supp	ort (QQ:8	3000	0375:	l) p	c.:RN	/B600	00	STC:	TU		
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min baud 2400 • max baud 115200 •	00020h	34 39	00	00	00 0	0 00	00	00	00 00	00 0	00	00 00	00 0	49
Address	00030h	00 00	00	00	00 0	0 00	00	00	00 00	00 0	00	00 00	00 0	
Ox0000 🔽 Clear code buffer 🛛 Open Code File	00040h	08 00	00	01	00 0	0 00	01	00	00 00	00 0	A3 1	DD 61	B BF	
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DACCOC CICHAI EMILON DAITEI OPEN EMIRON FILE	00060h	00 00	00	00	00 0	0 00	00	00	00 00	00 00	00	00 00	0 00	
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Hardware enable WDT after power-on-reset	TimerO and	Timer2	are	usa	ble,	but :	no T:	imer	1					
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Step 5: Choose the correct COM port

The software will automatically choose the correct COM port. If not, choose it manually now.



Step 6: Download/Program

Now click the "Download/Program" button and it will be down quickly.

STC-ISP (V6.85H) (Sales: 0513-55012928) Web:www	STCMCU.com	(Supp	oort (2Q:8	30000	0375	51) p	c.:RN	1B600	00	ST			X
MCU Type IAP15W413AS Pins Auto	Code Buffer	Recom	mend	Boo	k CO	OM H	elper	Kei	1 ICE	Set	tings	MCI	∫ Sel¢	•
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min badd 2400 + max badd 115200 +	00020h	34 39	00	00	00 0	0 0	0 00	00	00 00	00 0	00	0 00	0 00	
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Ox0000 🗹 Clear code buffer Upen Code File	00040h	08 00 EC 44	00	01	10 0	0 0		00	20 00	00 0	A3 1	00 6	B BF	
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✓ Inhibit EEPROM operation under Low-Voltag														
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Hardware enable WDT after power-on-reset	About this MC	11.												
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4. MCU code

The main.c is commented in both Chinese and English. Download the source from our website.

The code is quite straightforward. If you have any questions, please as in our forum.

```
void main(void)
```

{

```
led_init(); //LED set to output
led_off(); //LED turn off
router_init(); //router set to output
router_close(); //close router
router_open(); //open router
UART_config(); //UART init
PCA_config(); //PWM init
pca_pwm_init(); //PWM set to output
//TIME_PWM test
P_PWM = 0;
P3M1 &= ~(1 << 5); //P3.5 set to output</pre>
```

ver 20151009

```
P3M0 |= (1 << 5);
       Timer_config();
       pwm = 2768; //set a init value for PWM, %10 duty cycle
       LoadPWM(pwm);
       EA = 1;
                                                   //init interrupt
       while (1)
        {
               delay_ms(1);
               if(++communicate_time > 500) //Increase each loop, when bigger than
500, it will regard as communication interrupt
               {
                        //failsafe
                        message_data[0]=1500;
                        message_data[1]=1500;
                       message_data[2]=1500;
                        message_data[3]=1500;
                        if(communicate_time==60000)//lost control
                        {
                               led_on();//turn on LED
                        }
                        else
                        {
                              led_off();//turn off LED
                        }
                }
                get_message(); //get messages
                / *
                 PWM calculation:
                * 924+3.68*(1000-1000)
                                                924 0.5
                * ----- = ----- = -----
                         36874
                                               36874
                                                              20
                                                2764 1.5
                * 924+3.68*(1500-1000)
                                       = ----- = ------
                *
                         36874
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                +
                * 924+3.68*(2000-1000)
                                                 4604
                                                              2.5
                * _____ = _____ = _____
                   36874
                *
                                              36874
                                                             20
                * /
                //message_data[0] is steering,message_data[1] is throttle
                //pwm2 connected to GL-MOTO-Mini's PWM1,the timmer is pwm2, pin is P2.7
                //PWM1 full cycle
                pwm2 = 924+3.68*(message_data[1]-1000);//20ms duty cycle 0.5~2.5
                if(pwm2 >= PWM_HIGH_MAX_PCA) pwm2 = PWM_HIGH_MIN_PCA;
                PWMn_Update(PCA2,pwm2);
```

```
//PWM1 half cycle
                 //pwm2 = 1843+1.85*(message_data[1]-1000);//20ms duty cycle 1~2
                  //if(pwm2 >= PWM_HIGH_MAX_PCA) pwm2 = PWM_HIGH_MIN_PCA;
                 //PWMn_Update(PCA2,pwm2);
                 //pwml connected to GL-MOTO-Mini's PWM2,timer is pwml, pin is P2.6
                 //PWM1 full cycle
                 pwml = 924+3.68*(2000-(message_data[0])); //20ms duty cycle
0.5~2.5
                 if(pwml >= PWM_HIGH_MAX_PCA) pwml = PWM_HIGH_MIN_PCA;
                 PWMn_Update(PCA1,pwm1);
                 //PWM2 half cycle
                 //pwm1 = 1843+1.85*(message_data[0]-1000);//20ms duty cycle 1~2
                 //if(pwml >= PWM_HIGH_MAX_PCA) pwml = PWM_HIGH_MIN_PCA;
                  //PWMn_Update(PCA1,pwm1);
                 //pwm0 is connected to GL-MOTO-Mini's PWM3, timer is pwm0 pin is P2.5
                  //PWM3 full cycle
                 pwm0 = 924+3.68*(message_data[0]-1000);//20ms duty cycle 0.5~2.5
                 if(pwm0 >= PWM_HIGH_MAX_PCA) pwm0 = PWM_HIGH_MIN_PCA;
                 PWMn_Update(PCA0,pwm0);
                 //PWM3 half cycle
                 //pwm0 = 1843+1.85*(message_data[0]-1000);//20ms duty cycle 1~2
                  //if(pwm0 >= PWM_HIGH_MAX_PCA) pwm0 = PWM_HIGH_MIN_PCA;
                 //PWMn_Update(PCA0,pwm0);
                 pwm = 924+3.68*(message_data[0]-1000);//20ms duty cycle 1~2
                 if(pwm >= PWM_HIGH_MAX_TIME) pwm = PWM_HIGH_MAX_TIME;
                 LoadPWM(pwm);
                 //pwm = 1843+1.85*(message_data[0]-1000);//20ms duty cycle 1~2
                 //LoadPWM(pwm);
        }
}
```

The control message is parsed in getmessage(), the message format is

#,1500,1500,1500,1500#

The message format is used to determine if this is a control message send from CPU. The values (1500) will be real values send by CPU.

5. The OpenWrt firmware

The OpenWrt firmware can be downloaded from our website. OpenWrt uses UART to communicate with the MCU. A daemon program is running to get message from smartphone client and then send to MCU.

(This part is to be finished)

6. Android Client

Step 1: Connect to the Wi-Fi controller

First, turn on your Wi-Fi to scan a list of wireless Aps. You will find **GL-iNet-smartcar**, click and connect to it.

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< WLAN				
开启WLAN	١			0
连接的WLAI	N			
GL-iNet- 已连接	smartcar		((î;-	\bigcirc
选取附近的V	VLAN			
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GL-iNet- 通过 WPA/W	• 83c PA2 进行保护		((:•	\bigcirc
GL-iNet- 已保存,通过	VER WPA/WPA2	进行保护	((î:	\bigcirc

Step 2: Run the APP

Run the app. It will find the controller and automatically connect to it. Click **PLAY** to continue.



Step 3, turn ON/OFF live video streaming

In the interface, you can turn on/off live video streaming by clicking "Camera ON" button. "Adj" button is used for advanced adjustment.





7. IOS APP

The IOS app is available in apple store.

(This part is to be finished)