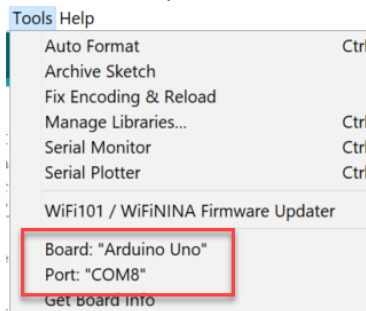


Burning 3D Chameleon Firmware using Arduino Uno on Windows

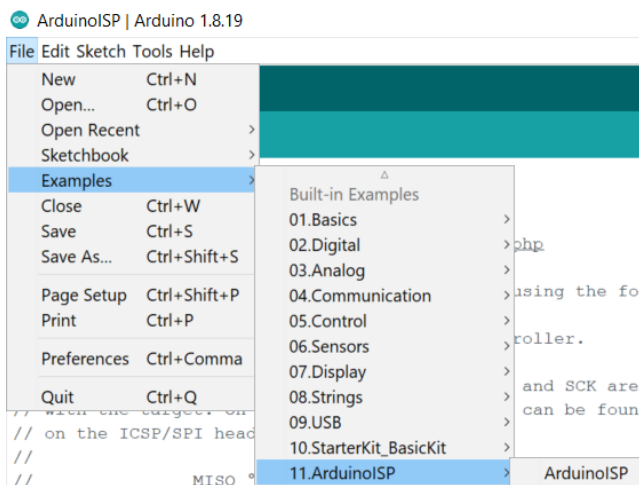
Load Arduino Uno with ArduinoISP

1. Plug in my Arduino Uno (clone) via USB.
2. Startup Arduino IDE (mine is version 1.8.19)
3. Made sure my Arduino Uno and port is selected

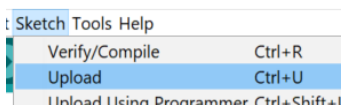


Remember the port number as we'll need this for avrdude later. Mine is com8

4. Open the ArduinoISP sketch that is provided with the IDE. Go to File → Examples →> 11. ArduinoISP→ArduinoISP

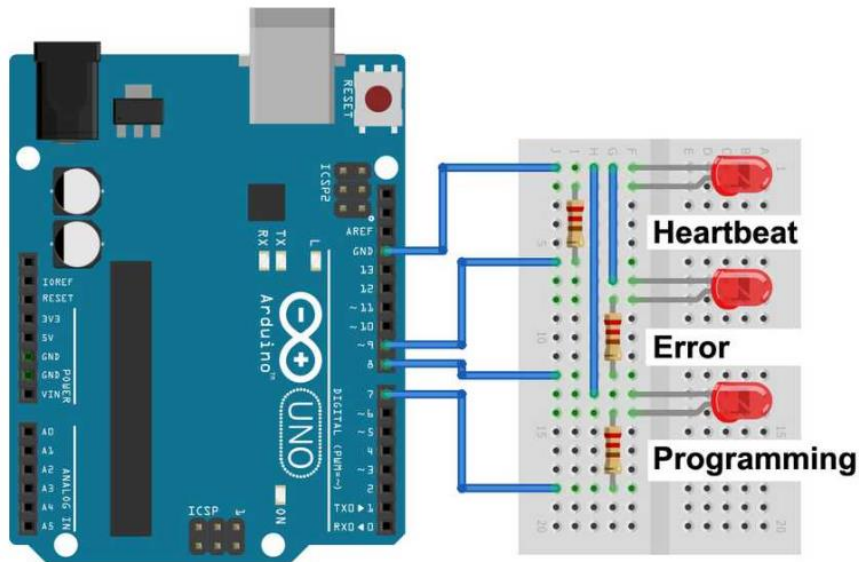


5. Upload the Sketch to UNO , Sketch → Upload. It'll compile and upload to UNO



6. Unplug the UNO

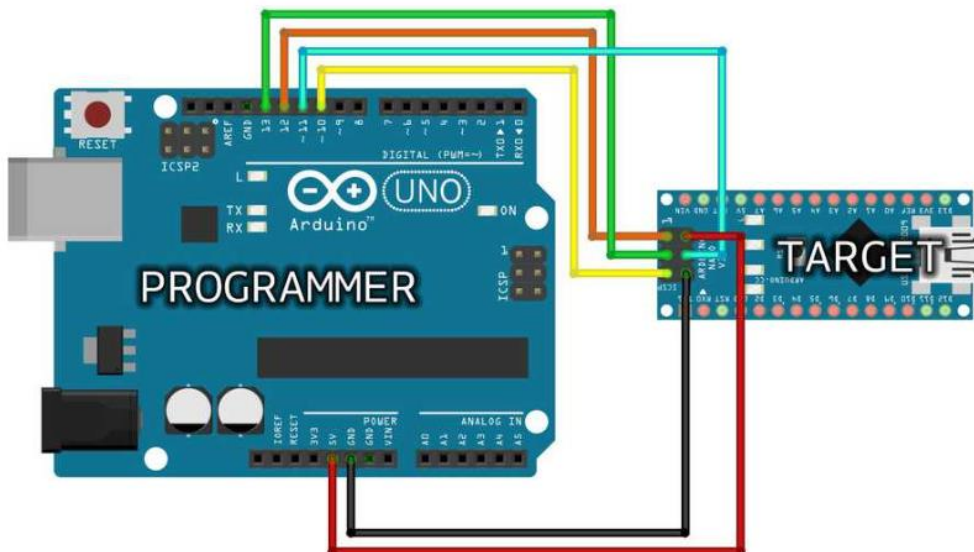
7. Optional – I build the LED so that I know if it is programming (<https://docs.arduino.cc/built-in-examples/arduino-isp/ArduinoISP>) . Resistor is 220 ohm



8. Plug UNO back to USB and the three LED will flash one at a time.

Wiring the UNO (programmer) with the 3D Chameleon control box

1. Firstly, unplug UNO from USB so that there's no power
2. Plug the wiring like below



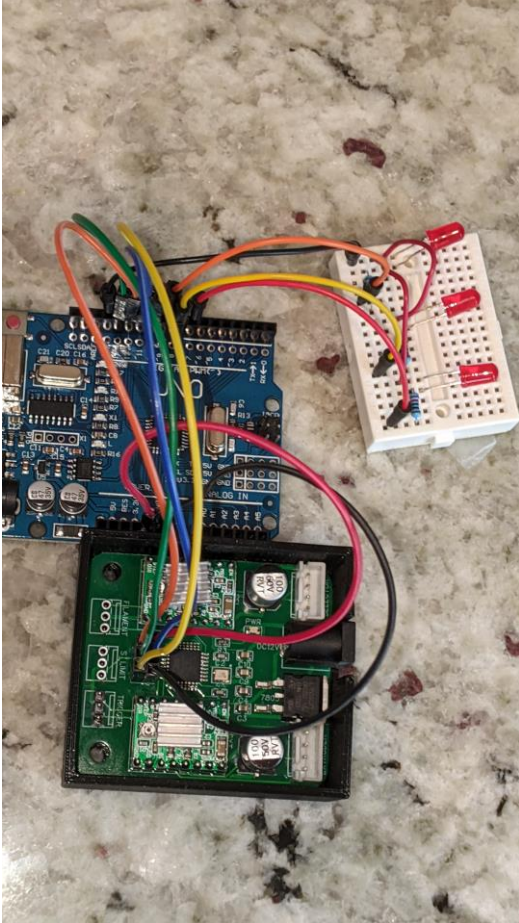
Or

	Arduino as ISP	3D Chameleon ICSP pin
MISO	D12	1
Vcc / 5V	5V	2
SCK	D13	3
MOSI	D11	4
RESET	D10	5
GND	GND	6

3. Pin 1 of 3d Chameleon ICSP board is under the 'I'



4. My final wiring looks like this



5. Now it's ready for programming

Flashing the Firmware using avrdude command prompt

1. Download the new firmware. I put it where the avrdude config file (avrdude.conf) is because I don't want to type long parameters. In my case I put it in
C:\MyDev\arduino-1.8.19\hardware\tools\avr\etc
2. Start the command prompt

```

C:\MyDev\arduino-1.8.19\hardware\tools\avr\etc>dir
Volume in drive C is Windows
Volume Serial Number is 300F-7E63

Directory of C:\MyDev\arduino-1.8.19\hardware\tools\avr\etc

10/31/2022  04:39 PM    <DIR>          .
10/31/2022  04:39 PM    <DIR>          ..
06/19/2019  04:45 PM                506,993 avrdude.conf
10/30/2022  11:14 PM                7,639 SelectorFirmwareMk3.hex
           2 File(s)                514,632 bytes
           2 Dir(s)  326,459,183,104 bytes free

C:\MyDev\arduino-1.8.19\hardware\tools\avr\etc>

```

3. I added the location of the avrdude executable to my path

Path= path=C:\MyDev\arduino-1.8.19\hardware\tools\avr\bin;%path%

```

C:\MyDev\arduino-1.8.19\hardware\tools\avr\etc>path=C:\MyDev\arduino-1.8.19\hardware\tools\avr\bin;%path%

```

Now I can call avrdude from the config file location.

4. Plug in the UNO back to the USB port and wait for it to powerup.
5. Then I check to see if UNO can talk to the 3D Chameleon with this command. Fyi my comm port to the UNO is **com8**.

avrdude -P com8 -b 19200 -c avrisp -p m328p -v

6. If it works ok, it will not have errors , eg:

```

C:\MyDev\arduino-1.8.19\hardware\tools\avr\etc>avrdude -P com8 -b 19200 -c avrisp -p m328p -v

```

avrdude: Version 6.3-20190619

Copyright (c) 2000-2005 Brian Dean, <http://www.bdmicro.com/>

Copyright (c) 2007-2014 Joerg Wunsch

System wide configuration file is "C:\MyDev\arduino-1.8.19\hardware\tools\avr\etc\avrdude.conf"

```

Using Port          : com8
Using Programmer     : avrisp
Overriding Baud Rate : 19200
AVR Part             : ATmega328P

```

Chip Erase delay : 9000 us
 PAGEL : PD7
 BS2 : PC2
 RESET disposition : dedicated
 RETRY pulse : SCK
 serial program mode : yes
 parallel program mode : yes
 Timeout : 200
 StabDelay : 100
 CmdexeDelay : 25
 SyncLoops : 32
 ByteDelay : 0
 PollIndex : 3
 PollValue : 0x53
 Memory Detail :

	Block Poll					Page			Polled				
Memory Type	Mode	Delay	Size	Indx	Paged	Size	Size	#Pages	MinW	MaxW	ReadBack		
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		
eeeprom	65	20	4	0	no	1024	4	0	3600	3600	0xff 0xff		
flash	65	6	128	0	yes	32768	128	256	4500	4500	0xff 0xff		
lfuse	0	0	0	0	no	1	0	0	4500	4500	0x00 0x00		
hfuse	0	0	0	0	no	1	0	0	4500	4500	0x00 0x00		
efuse	0	0	0	0	no	1	0	0	4500	4500	0x00 0x00		
lock	0	0	0	0	no	1	0	0	4500	4500	0x00 0x00		
calibration	0	0	0	0	no	1	0	0	0	0	0x00 0x00		
signature	0	0	0	0	no	3	0	0	0	0	0x00 0x00		

Programmer Type : STK500
 Description : Atmel AVR ISP
 Hardware Version: 2
 Firmware Version: 1.18
 Topcard : Unknown
 Vtarget : 0.0 V
 Vref : 0.0 V
 Oscillator : Off
 SCK period : 0.1 us

avrdude: AVR device initialized and ready to accept instructions

Reading | ##### | 100% 0.03s

avrdude: Device signature = 0x1e950f (probably m328p)
 avrdude: safemode: lfuse reads as 62

```
avrdude: safemode: hfuse reads as D9  
avrdude: safemode: efuse reads as FF
```

```
avrdude: safemode: lfuse reads as 62  
avrdude: safemode: hfuse reads as D9  
avrdude: safemode: efuse reads as FF  
avrdude: safemode: Fuses OK (E:FF, H:D9, L:62)
```

avrdude done. Thank you.

7. Now I burn the firmware using this command and if there are no errors, then it is done. Make sure at the end of the hex file there is a `:i` (colon 'i') for intel code.

```
avrdude -P com8 -b 19200 -c avrisp -p m328p -v -e -U flash:w:SelectorFirmwareMK3.hex:i
```

8. Notice: Don't change any fuse settings when programming.