



Flashing a Bootloader to the CR-10



by DonovanB17

The Melzi board contained in the Creality CR-10 does not come pre-flashed with a bootloader. A bootloader is what enables us to write firmware over usb. If we plan on flashing new firmware and don't want to have to take the control box apart every time, we need to flash one.

We will be flashing this bootloader via ICSP using an Arduino as the programmer. This same task can be

completed using a USB ICSP Programmer. I had an Arduino Uno lying around so that's what we'll use for this demonstration.

Note that the firmware I provided is almost totally stock. I made no real modifications. I simply provided this for others who wish to modify their firmware.



Step 1: Programming the Arduino UNO

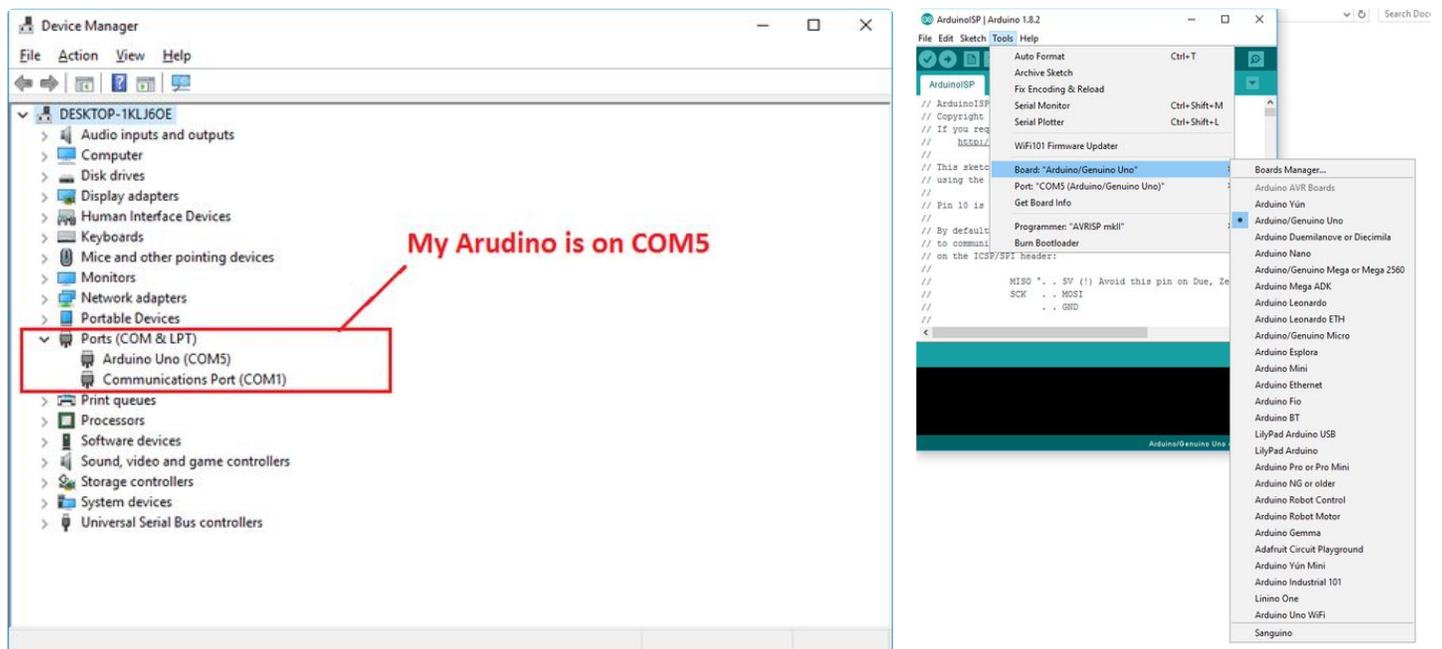
First, download and install the latest version of the Arduino IDE from Arduino. Then connect your Arduino via USB to your PC. Once connected we will have to determine which COM port your Arduino is using. So open up Device Manager and under the "Ports" section, see what COM port yours is using. In the screenshot I provided, my Arduino was using COM5.

Now we can head over to the Arduino IDE that we installed earlier.

1. Open the Arduino IDE that you just downloaded
2. From the Tools menu, select Board and then chose your board type (Arduino/Genuino UNO in my case)
3. From the Tools menu, select the port your Arduino is connected to (COM5 in my case)
4. From the File menu, select Examples > ArduinoISP > ArduinoISP
5. Select Upload (Sketch > Upload or the small right facing arrow on the toolbar)

Once that uploads successfully, your Arduino is now an ISP Programmer! Disconnect it from your PC and close the Arduino IDE.

We can now connect to our Melzi board.



Step 2: Wiring It Up

1. First off, you will have to turn off the power and remove all of the cables from the control box.
2. Once it is free, flip it over to remove the screws holding the bottom plate on.
3. Flip it over and remove the two screws on the side of the box holding up the power supply.

Once you've moved the power supply out of the way (be careful as some of the wires connected to it are not very long) you should be able to see the controller board. You can either remove the controller board from the housing or leave it in place. I chose to leave it in place to save time. If you do the same, find something to prop up the power supply.

Next, swap the USB/VREG jumper to USB so that we can power the board via USB. You can find it's location on the picture I attached.

Now we have to wire our Arduino to the Melzi controller board inside our CR-10. This will be done by connecting the ICSP pins on the Arduino to the ICSP pins on the Melzi. I've attached a few pictures to see how this is done. I recommend using female to female jumper wire to do this but any way you can wire this can work. It should be wired as follows:

Melzi ----> Arduino

MISO ----> MISO

5V -----> 5V

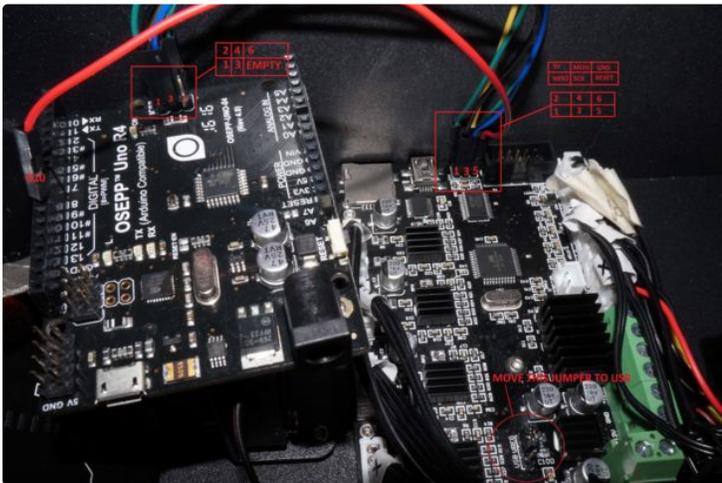
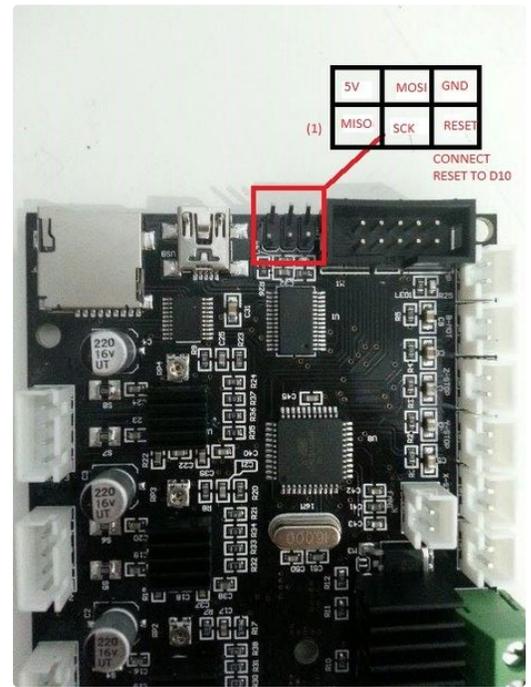
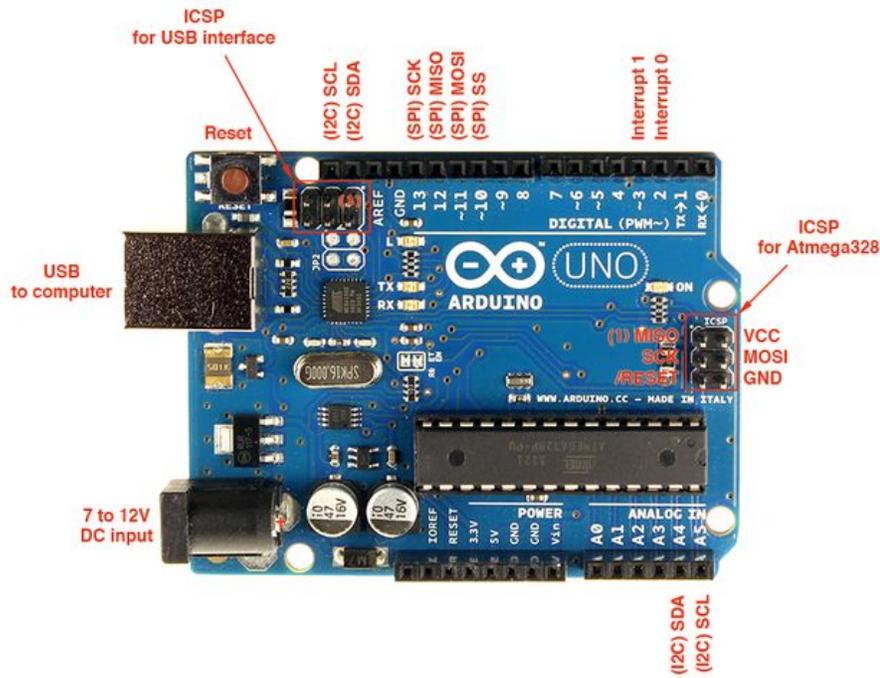
SCK ----> SCK

MOSI ---> MOSI

RESET -> Digital Pin 10

GND ----> GND

If you line up the Arduino and Melzi like I have in my picture, you can just connect the pins on each board as you see them (top left to top left, bottom left to bottom left etc..) with the exception of the RESET pin on the Melzi. The RESET pin on the Melzi needs to be connected to Digital Pin 10 on the Arduino. You can make this connection with a female to male jumper wire or you can do what I did and just slide a small pice of tinned wire in one side of a female to female jumper wire.



Step 3: Flashing the Bootloader

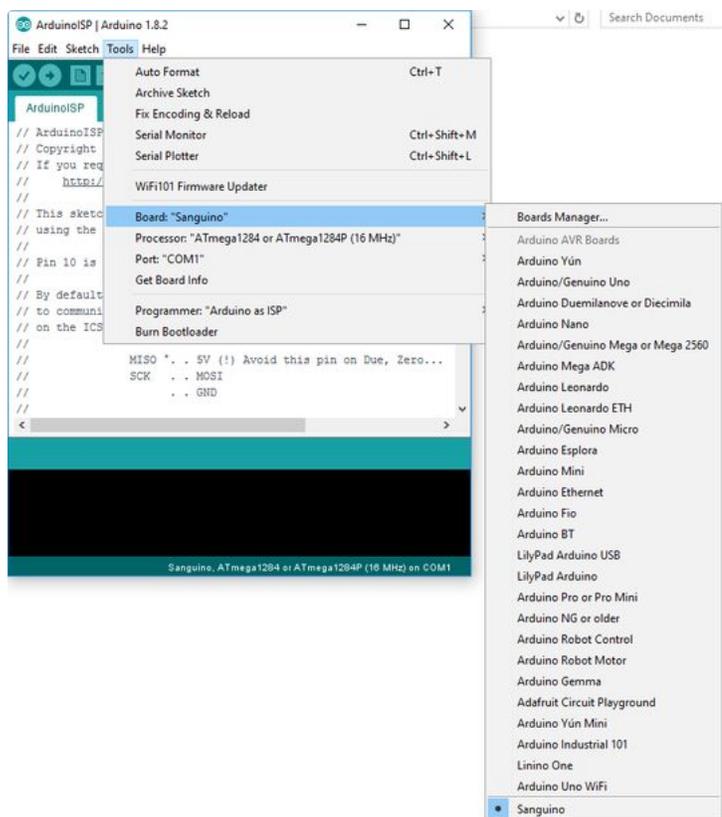
We will now flash the bootloader to the Melzi board using the Arduino UNO as a programmer. First, we have to download the Sanguino add-on for our Arduino IDE:

1. Download Sanguino from this link.
2. Extract the contents of the zip to your Arduino hardware directory (usually Program Files (x86)\Arduino\hardware)

Now we can connect things to our PC and start flashing:

1. Once everything is wired up correctly, connect the Melzi board to your PC via USB.
2. Go back into Device Manager and verify which COM port the Melzi board is using.
3. Now you can plug your Arduino board into the PC via USB as well.
4. Open the Arduino IDE and from the Tools Menu select Board > Sanguino
5. Select Tools > Processor > ATmega 1284P 16Mhz
6. Select Tools > Port and choose the port for the Melzi board that you just found from Device Manager
7. Select Tools > Programmer > Arduino as ISP
8. Finally, Select Tools > Burn Bootloader

If everything was done correctly, it will now burn the bootloader to the Melzi board using the Arduino UNO as an ICSP programmer. At the bottom of the Arduino IDE window, there will be a small black box that should say it completed successfully.



Step 4: Flashing Firmware

Now that our Melzi has a bootloader burned to it, we can flash it via USB. You can disconnect the Arduino from the Melzi board now.

For the firmware I provided on the Facebook group, you will need to download Arduino v1.0.5 (I used 1.0.5-r2). You can find it on Arduino's website. You will also need to extract the Sanguino folder to the hardware folder of the Arduino v1.0.5 installation.

1. Extract the firmware to a folder somewhere.
2. Open Arduino v1.0.5
3. File > Open and locate the folder you extracted
4. Select the Marlin.ino file.

This will now open the firmware in Arduino, you can make whatever changes you'd like here. Most changes will occur in the Configuration.h file. Once you're happy with your firmware settings:

1. Set your board to Sanguino W/ ATmega1284 or ATmega1284P (16MHz) (Tools > Board)
2. Set your port to the COM port for the Melzi board (same as the previous step Tools > Serial Port)
3. Set your Programmer to AVRISP mkII (Tools > Programmer).

Now you can hit upload and, if you've done everything right, you will now have a custom firmware on the CR-10. Any time you want to change something in your firmware, simply connect via USB, open Arduino v1.0.5, make your changes and hit upload!

MAKE SURE TO SWITCH THE **USB/VREG JUMPER BACK TO **VREG** BEFORE CLOSING UP THE BOX!**