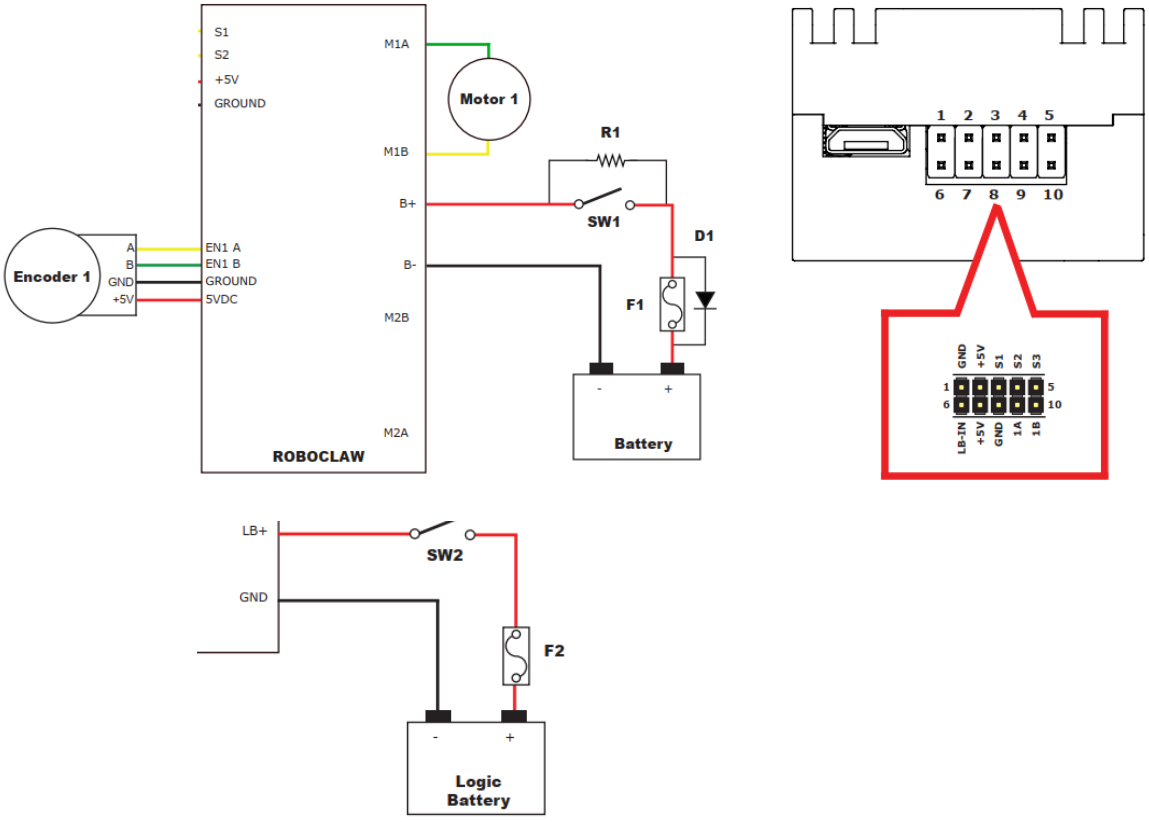
Configuración del RoboClaw Solo 34VDC DC Motor Controller

1. **Instalar driver y Motion Studio**
   https://resources.basicmicro.com/usb-driver-and-basicmicro-motion-studio-installation/

2. **Realizar las siguientes conexiones**

   En la parte trasera del controlador se encuentran 4 cables: el rojo es B+, el negro B-, el verde M1A y el amarillo M1B. La batería para alimentar la parte lógica debe ser de mínimo 6V.

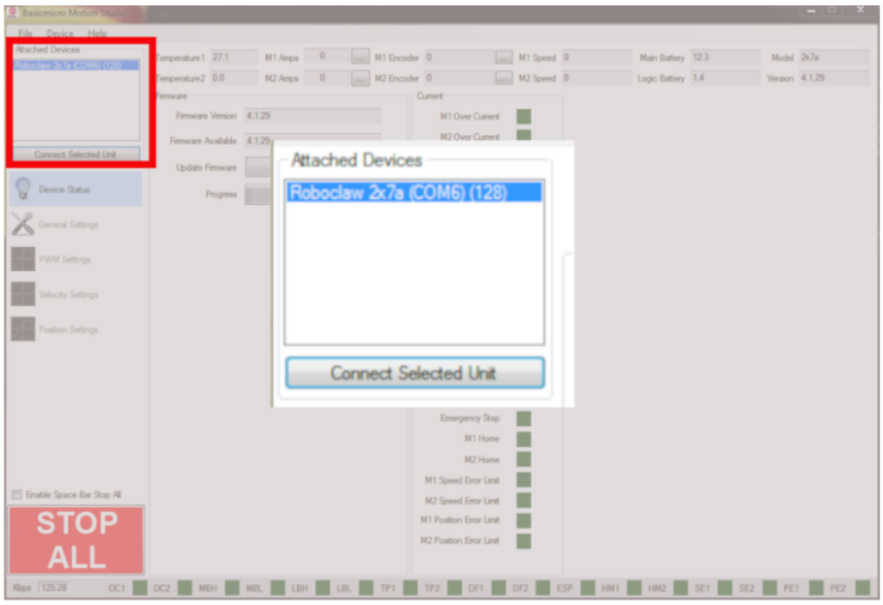


   En caso se coloque la resistencia en paralelo, R1 deberá ser de 1k y se deberá conectar además un switch en serie. El diodo debe ser uno que soporte 1 o hasta 3 A.

3. Abrir Motion Studio, conectar el RoboClaw via USB y actualizar Firmware

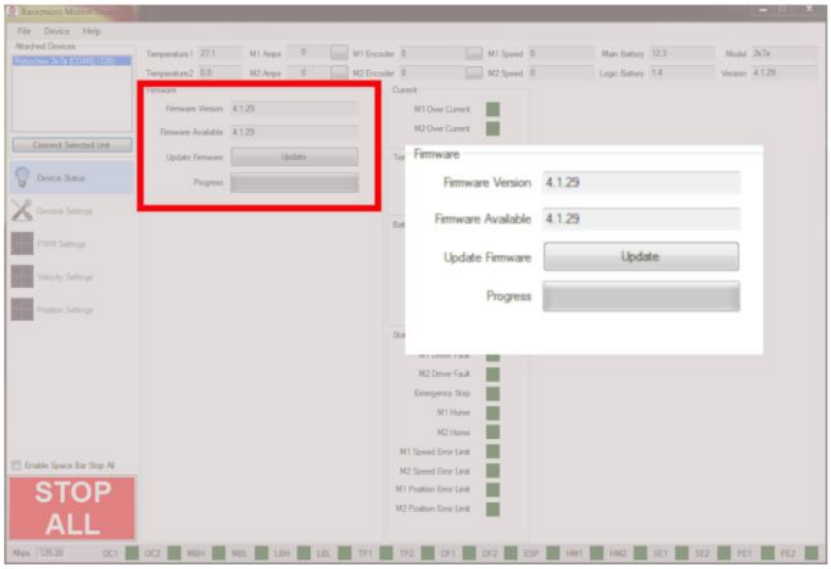
Connecting and Disconnecting a RoboClaw

After starting Motion Studio a RoboClaw must be connected to the application. In the upper left-hand corner of the application is a window that shows all of the RoboClaws visible to Motion Studio. To connect a RoboClaw select one from the list then click "Connect Selected Unit". The "Stat1" LED on the RoboClaw will flash rapidly when it's connected to Motion Studio. To disconnect the RoboClaw click on the same button used to connect the RoboClaw, it should be labeled "Disconnect Selected Unit".



Updating Firmware

The firmware for the RoboClaw motor controller can be updated from inside Motion Studio. Click on "Device Status" on the left side of Motion Studio. Now locate the section labeled "Firmware". There are two fields at the top of this section indicating the firmware currently on the board and the firmware version available from BasicMicro. If the two versions are the same the firmware does not need to be updated. If there is a difference in versions the firmware must be updated. To update the firmware click on the button labeled "Update". A dialog box will pop up with information on the new firmware, click "OK" and the update process with start. The RoboClaw will disappear from the list of devices and then be re-added to the list once the process completes. After updating the firmware the RoboClaw must be reconnected by clicking "Connect Selected Unit" to continue using Motion Studio.



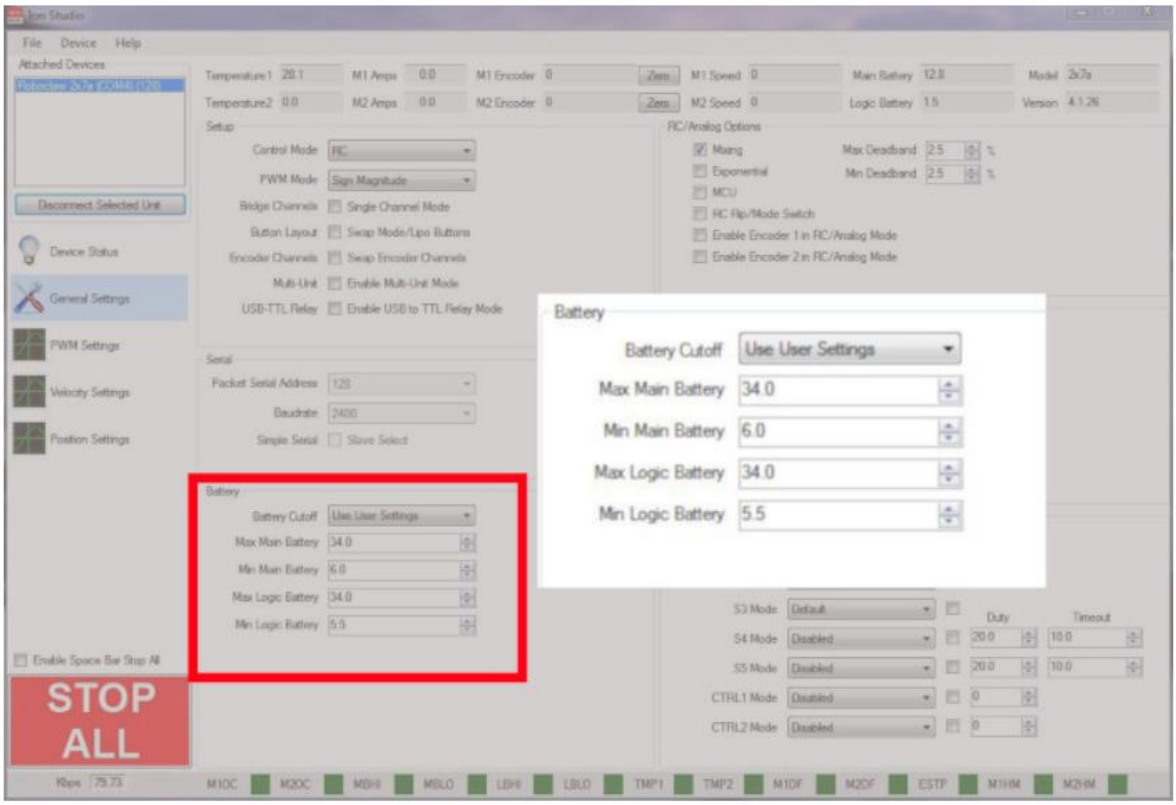
4. Configurar los ajustes de batería en Motion Studio

En la parte izquierda dirigirse a la sección “General Settings” y luego a “Battery Settings”, en ella colocar los voltajes mínimos y máximos en el modo “Use User Settings”, según el número de celdas de la batería de LiPo que se use para los motores (main) y la parte lógica.

Cells	Minimum Voltage	Maximum Voltage
2	6.0-7.0V	8.4V
3	9.0-10.5V	12.6V
4	12.0-14.0V	16.8V
5	15.0-17.5V	21.0V
6	18.0-21.0V	25.2V
7	21.0-24.5V	29.4V
8	24.0-28.0V	33.6V

Configuration

We’ll go over each configuration below. To configure the battery settings click on “General Settings” in the left-hand side of Basic Micro Motion Studio. Now locate the section labeled “Battery”. This is the section we’ll be using for this tutorial.



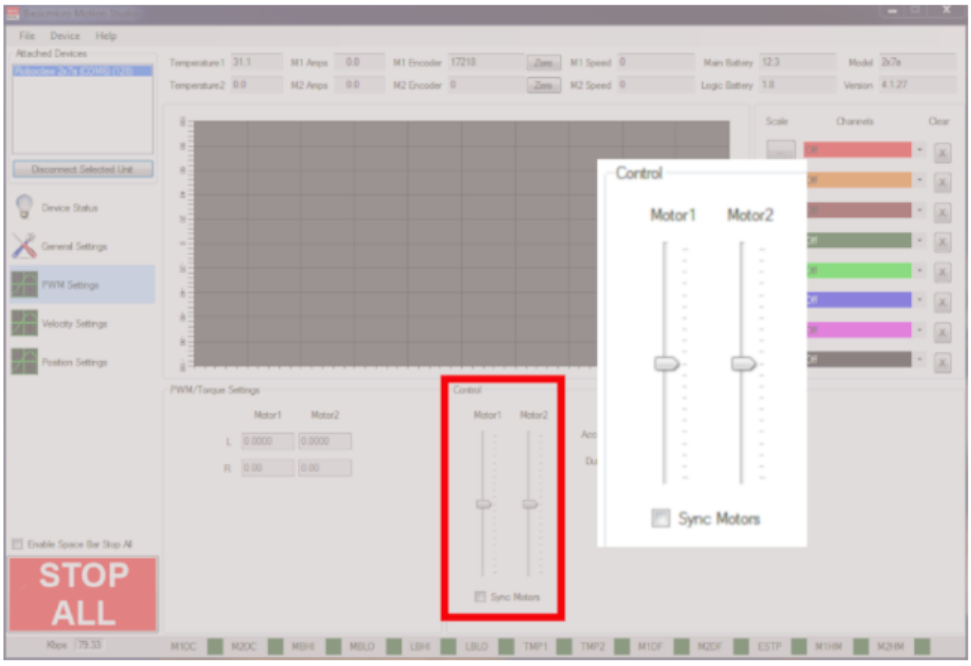
5. Verificar voltajes

Verificar con el multímetro, si los voltajes mostrados en la parte superior del programa Motion Studio son iguales a los medidos, de no ser iguales calibrar siguiendo esta guía: https://resources.basicmicro.com/calibrating-motor-controller-voltage-readings/, desde el paso 4.

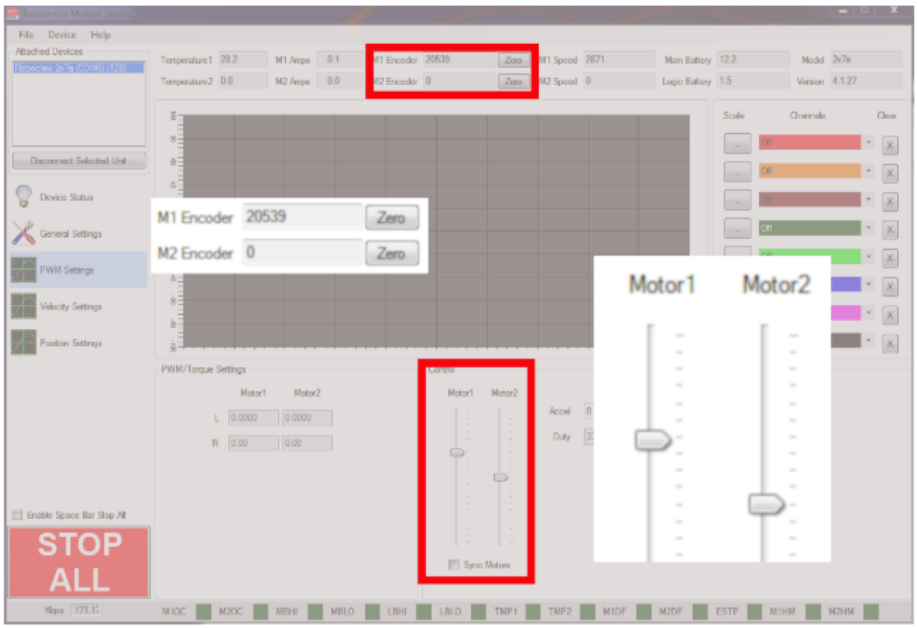
6. Testear los motores y lectura de encoder

Seguir los siguientes pasos para verificar el correcto movimiento del motor y la lectura del encoder.

5. Open Motion Studio and connect to the RoboClaw by clicking "Connect Selected Unit" in the upper left-hand side of the application. Click on "PWM Settings" in the left-hand pane. Here the motors will be tested to make sure they're working. Find the box labeled "Control". Slide the sliders for Motor 1 and/or Motor 2. The motors should turn when operating the sliders. Also check to ensure that the motors turn forwards when sliding the sliders up and backwards when sliding the sliders down. If the motors do not turn the proper direction you need to reverse the wiring of one or both motors.



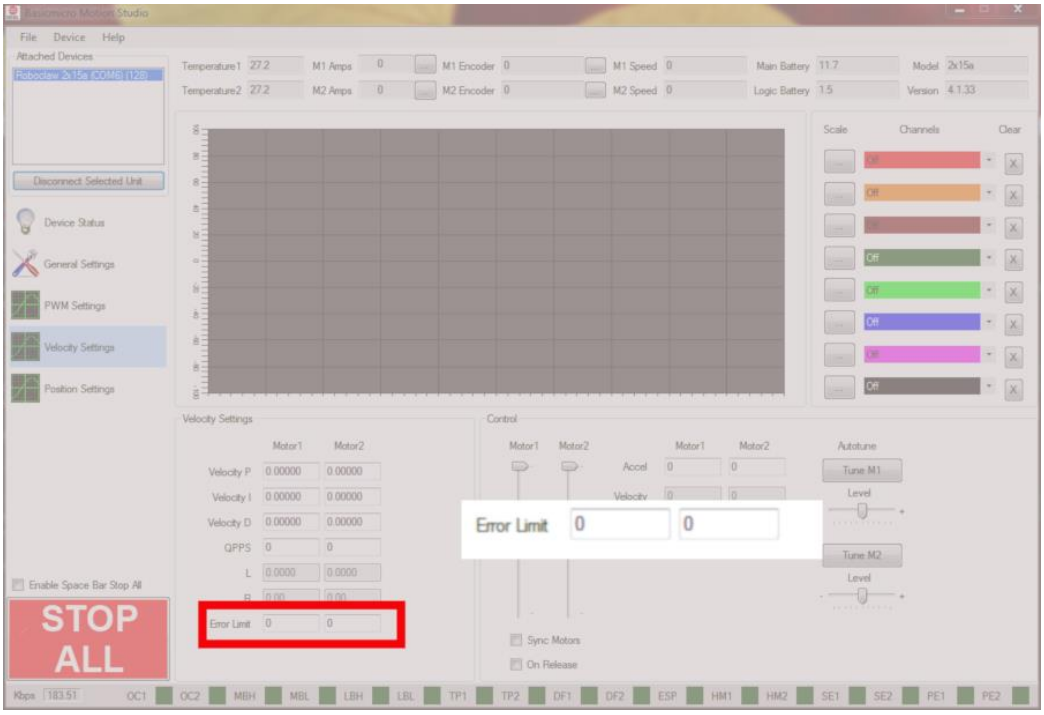
6. If encoders are being used they should be tested while still in the PWM Settings window. Use the sliders labeled “Motor 1” and “Motor 2” to move the motors forwards and backwards. Moving the slider up should move the motor forwards and down backwards. If the encoders are working properly the “M1 Encoder” and “M2 Encoder” values at the top of the window should increment when the motor moves in the forwards direction and decrement in the backwards direction. The the encoder counts do not increment and decrement properly reverse the encoder signal connections.

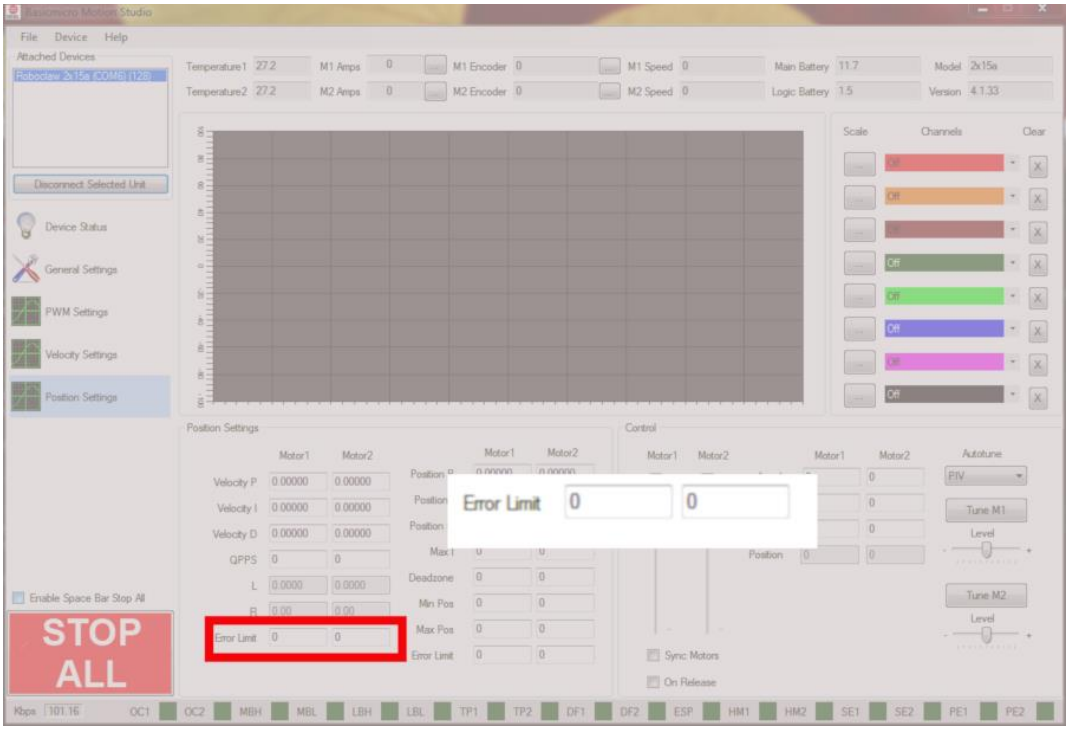


7. Autotune para velocidad y posición

Sintonizar los valores de PID para posición y velocidad, siguiendo esta guía https://resources.basicmicro.com/auto-tuning-with-motion-studio/

Adicionalmente, en los ajustes de velocidad y posición, se les puede establecer limites de error, para que en caso el error supere esos valores, los motores automáticamente se detengan.


Basicmicro Motion Studio
File Device Help
Attached Devices
Roboclaw 2x15a [COM8] [128]
Disconnect Selected Unit
Device Status
General Settings
PWM Settings
Velocity Settings
Position Settings
Temperature1 27.2
Temperature2 27.2
M1 Amps 0
M2 Amps 0
M1 Encoder 0
M2 Encoder 0
M1 Speed 0
M2 Speed 0
Main Battery 11.7
Logic Battery 1.5
Model 2x15a
Version 4.1.33
Scale
Channels
Clear
Velocity Settings
Motor1 Motor2
Velocity P 0.00000 0.00000
Velocity I 0.00000 0.00000
Velocity D 0.00000 0.00000
QPPS 0 0
L 0.0000 0.0000
R 0.00 0.00
Error Limit 0 0
Control
Accel
Velocity
Autotune
Tune M1
Level
Tune M2
Sync Motors
On Release
Enable Space Bar Stop All
STOP ALL
Kbps 183.51
OC1 OC2 MBH MBL LBH LBL TP1 TP2 DF1 DF2 ESP HM1 HM2 SE1 SE2 PE1 PE2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Position Settings
Motor1 Motor2
Velocity P 0.00000 0.00000
Velocity I 0.00000 0.00000
Velocity D 0.00000 0.00000
QPPS 0 0
L 0.0000 0.0000
R 0.00 0.00
Error Limit 0 0
Deadzone 0 0
Min Pos 0 0
Max Pos 0 0
Control
Autotune
Tune M1
Level
Tune M2
Sync Motors
On Release
Enable Space Bar Stop All
STOP ALL
Kbps 101.16
OC1 OC2 MBH MBL LBH LBL TP1 TP2 DF1 DF2 ESP HM1 HM2 SE1 SE2 PE1 PE2

8. Guardar ajustes en el controlador

Finalmente, se guardan todos los ajustes realizados en el controlador.

Saving Settings to Board

After making any changes to the settings in Motion Studio the changes must be saved to the motor controller. This is done by clicking "Device" in the menu at the top of the application and then clicking on "Write Settings". Once this is done the settings have been saved to the board and the board can be disconnected from Motion Studio.