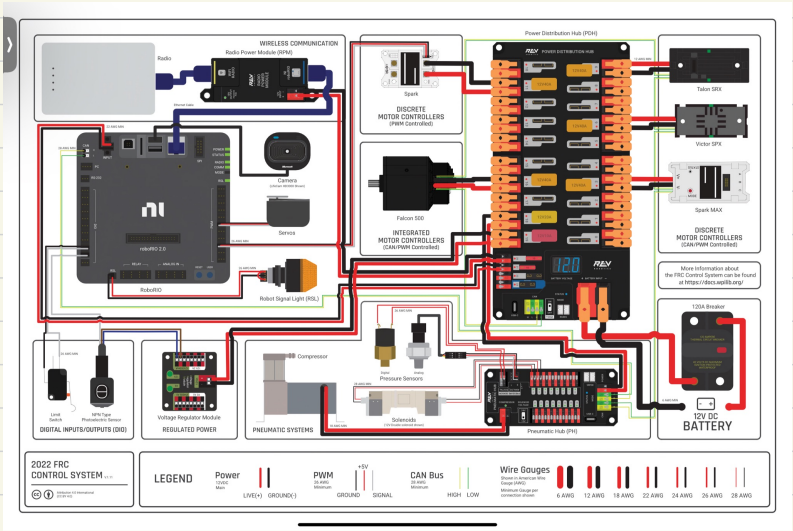
General Info

1. FRC Control Website
   https://docs.wpilib.org/en/stable/index.html

   a. Learn Java → Codecademy

   b. Learn wiring



C. Software Installation
   - WPI Lib
     https://docs.wpilib.org/en/stable/docs/zero-to-robot/step-2/offline-installation-preparations.html

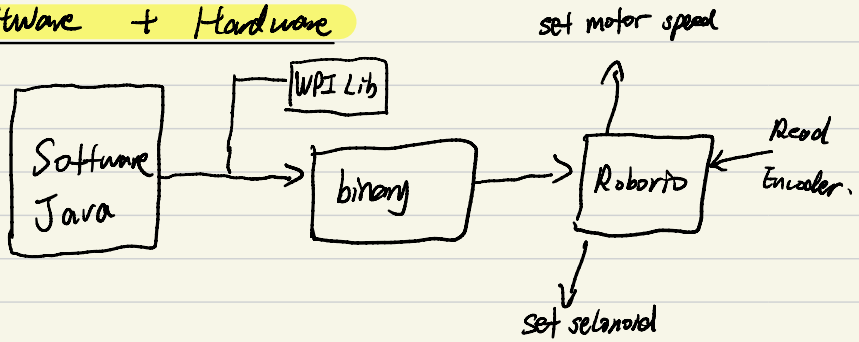
   - FRC Game Tools (DS, Robot Imager,
     https://docs.wpilib.org/en/stable/docs/zero-to-robot/step-2/frc-game-tools.html

- VS Code + WPI
  https://docs.wpilib.org/en/stable/docs/zero-to-robot/step-2/wpilib-setup.html

d. VS code 101 (Come back)
   - Create your first project

Details will covered later.

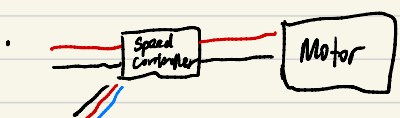
Software + Hardware



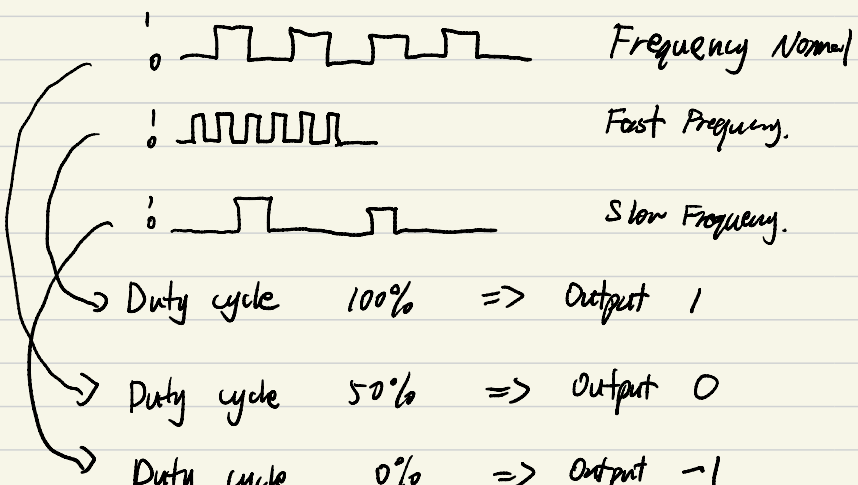
1. Motor Control (PWM)

a. plug a motor to a battery => 1

b. -1 and 1 output.



PWM (Pulse Width Modulation)



~~PWM~~ Set motor speed (__)

Pros

Easy wiring / coding

Cons

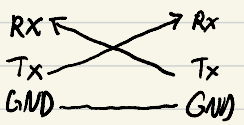
→ * Low resilience to interference / magnetic interference.

Controller —send→ Dumb device

Dumb device —Back→ Controller

2. Serial Communication (UART, RS-232, USART)

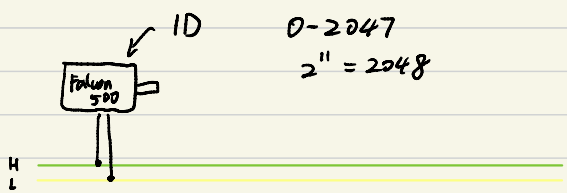
• USB.

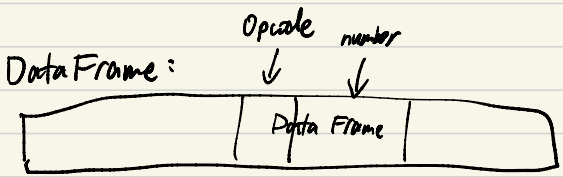


← send & receive

3. SPI , I2C

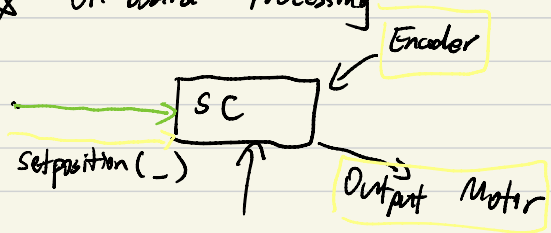
4. CAN (Controller Area Network)





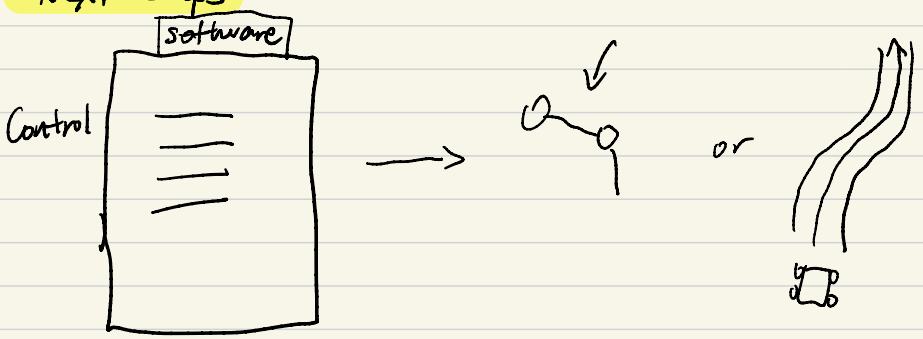
https://pwang649.github.io/myWiki/docs/Communication%20Protocols/Communication%20Protocols%20-%20CAN

On board Processing



(Foreshadowing to lectures in the future).

Next steps:

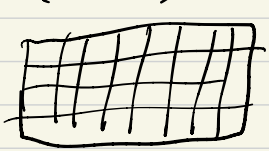


Vision

Encoder
↳ number

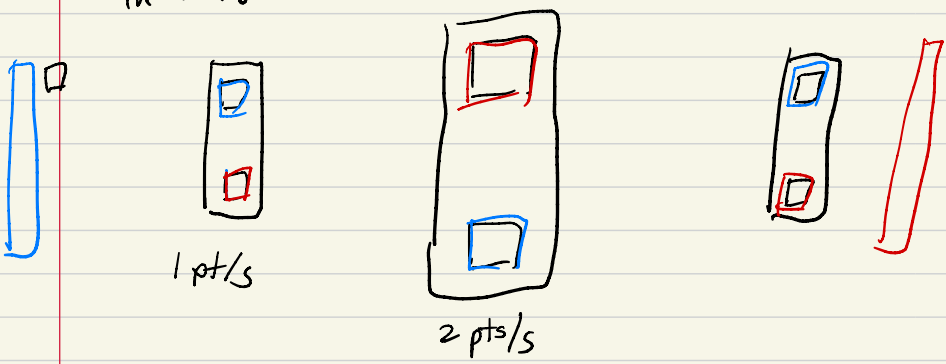
Beam-Breaker
↳ Boolean (True/False)

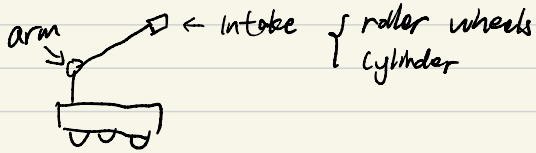
↳ Image
2D array of numbers
(0-255)



Game Play Strategies

In 2018



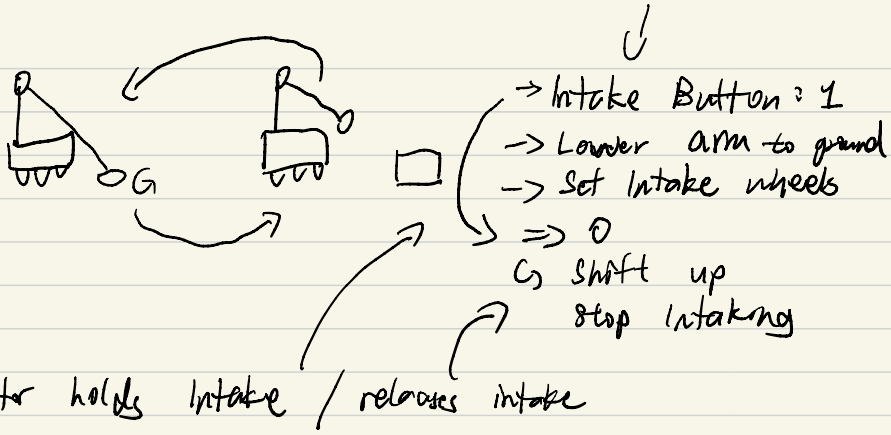
Teleop : 

Driver
- Driving
- shift gear

Operator
- Arm Position Control
- Intake (Spinning intake wheels)
- Outake (wheels + cylinder actuation)

Three positions ⟶ Joystick Buttons (2)
↳ Encoder read position
↳ Output

Ex:
Arm Subsystem.
→ Input (Encoder)
→ Command (Joystick)
→ Output <= Input + Command



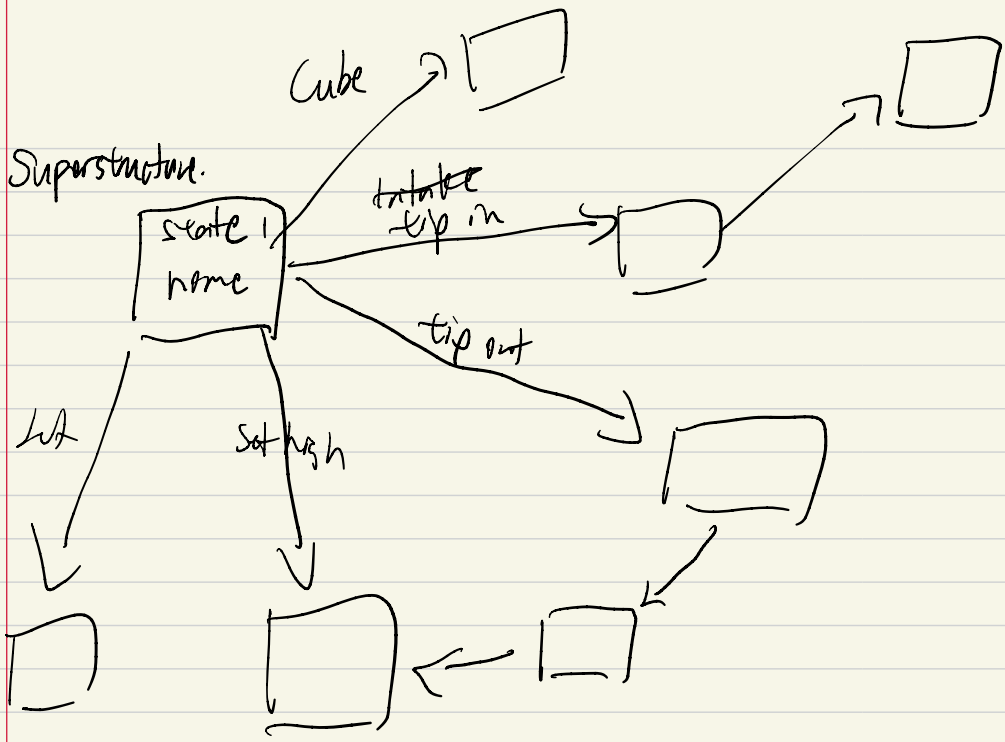
Auto :

1. Path following
2. Teleop features (Arm, Intake, Cylinder).

Ex. Chezy 18 Qual 49

Parallel { Path Following (First path)
Sequential { Set Arm Mid
Wait _ Secs
Set Arm High
Shoot

Parallel { Path Following (Path 2 : Backup)
Set Intake => 0
Set Arm Down



HW:

1. Install VS code UPI

2. Learn Java { if / else / For / while / switch.