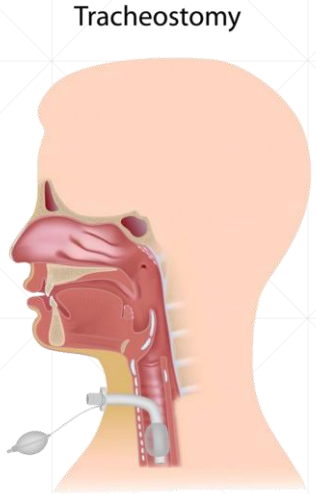
EDES 301

Trach Hero Proposal

10/05/2025

Meghan Paral

Background Information



Problem

Lack of accessible, affordable at-home training tools for caregivers of children with tracheostomies

Goal

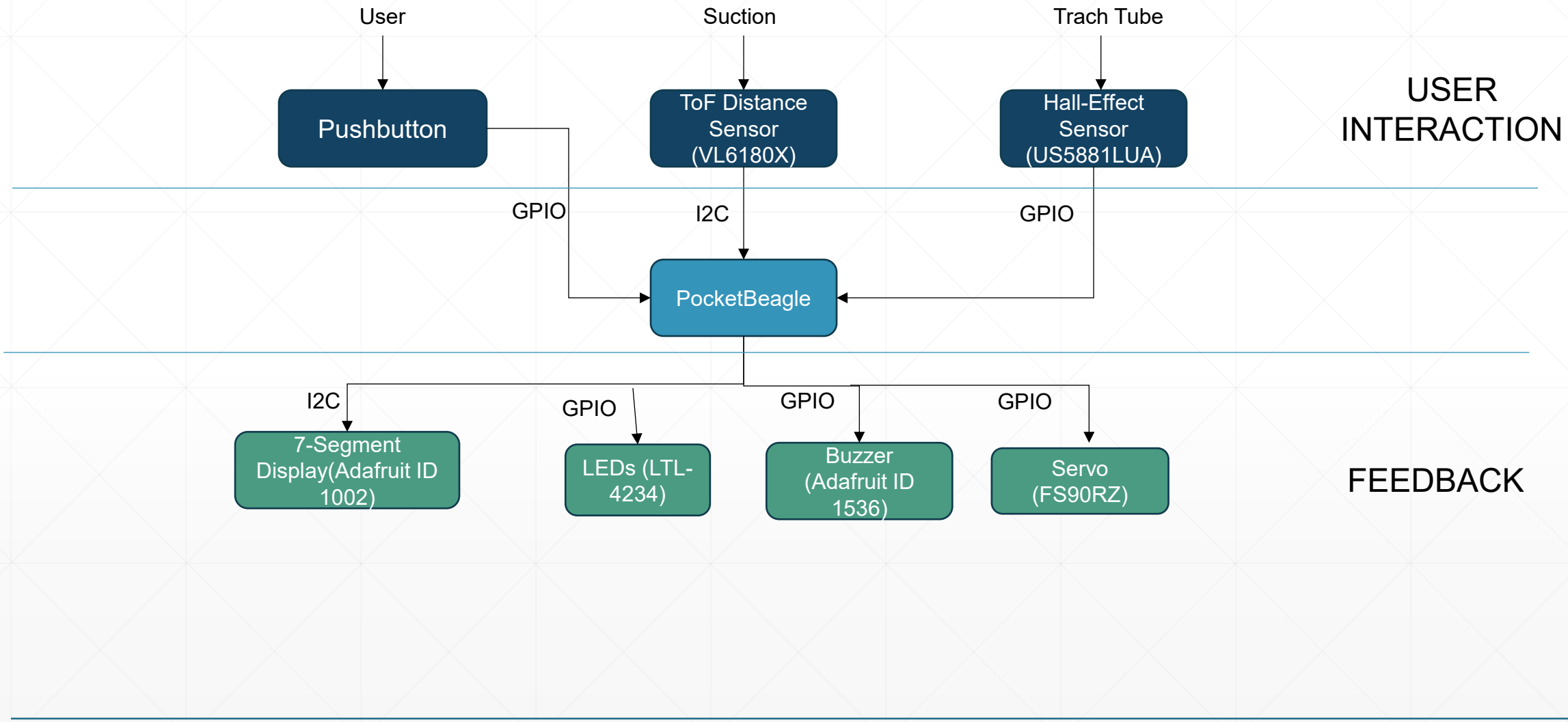
Create a low-cost, "gamified“ system to train caregivers in critical tracheostomy care skills, such as suctioning and tube changes.

System

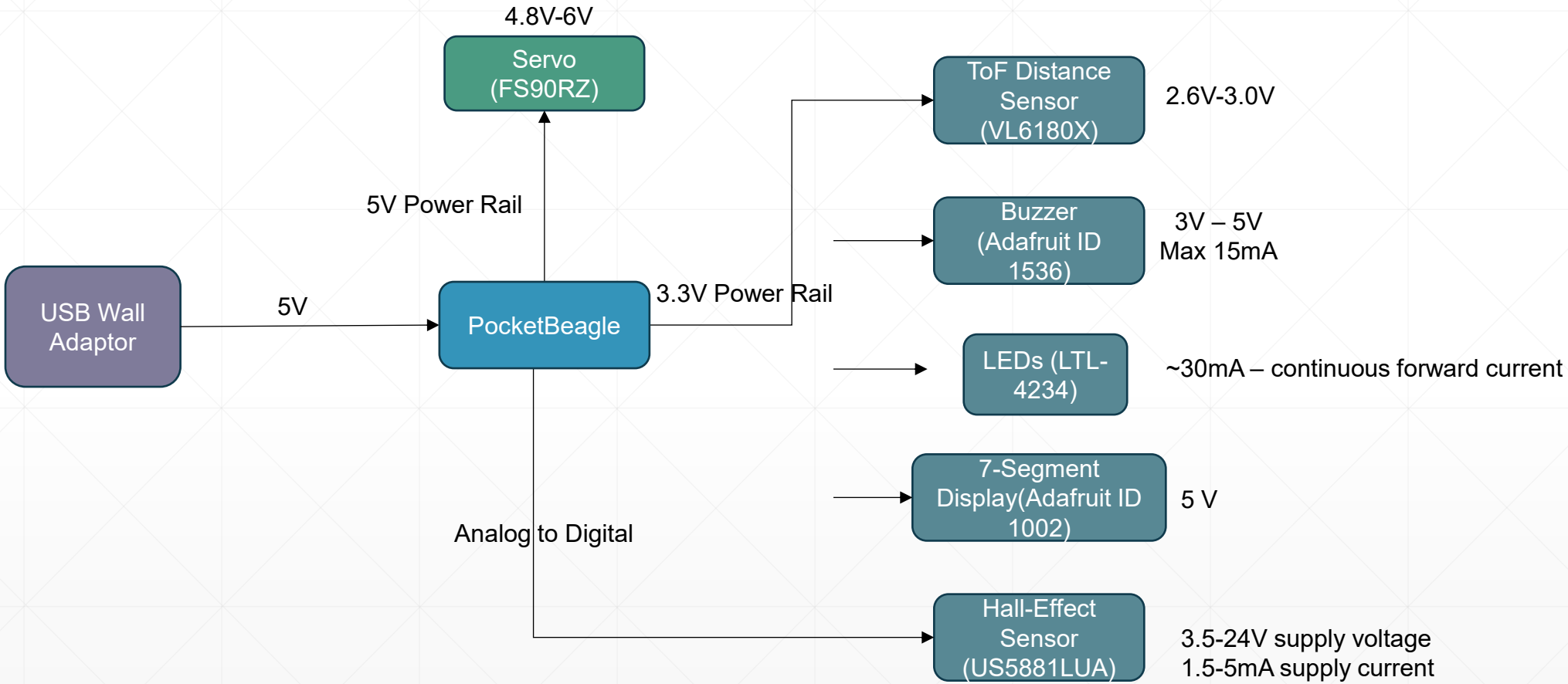
Sensors and real-time feedback with LEDs, acoustic, and haptic feedback

No existing projects I have found with a similar premise – here are some useful hackster pages though: https://www.hackster.io/SURYATEJA/amazing-games-using-hall-effect-sensors-518818

System Block Diagram



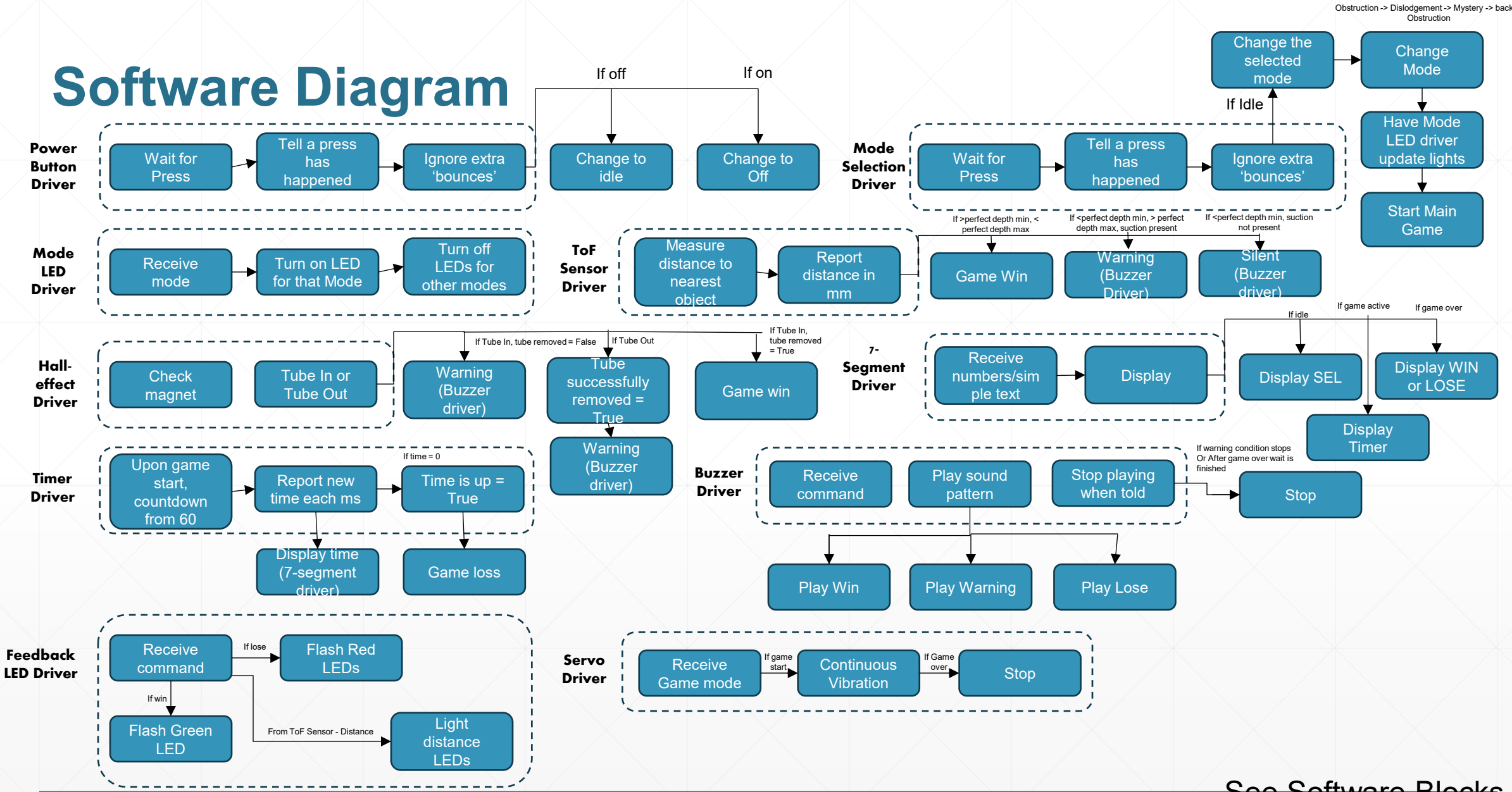
Power Block Diagram



Components / Budget - $27.85

Component	EDES301 to Buy?	Cost
PocketBeagle(parts kit)	No	$0.00
Pushbuttons(parts kit)	No	$0.00
LEDs(parts kit)	No	$0.00
Adafruit 0.56 4-Digit 7-Segment Display w/I2C Backpack - White [STEMMA QT / qwiic] : ID 1002 : Adafruit Industries, Unique & fun DIY electronics and kits	Yes	$10.95
Buzzer 5V - Breadboard friendly : ID 1536 : Adafruit Industries, Unique & fun DIY electronics and kits	Yes	$0.95
Adafruit VL6180X Time of Flight Distance Ranging Sensor (VL6180) [STEMMA QT] : ID 3316 : Adafruit Industries, Unique & fun DIY electronics and kits **NOT ON PARTS LIST**	Yes	$13.95
Hall effect sensor [US5881LUA] : ID 158 : Adafruit Industries, Unique & fun DIY electronics and kits **NOT ON PARTS LIST**	Yes	$2.00
Amazon.com: FEETECH FS90RZ 360 Degree Continuous Rotation Micro Servo Motor 9g Servo Mini Servo with Matching Wheels for RC Helicopter Airplane Car Boat Robot Controls : Toys & Games	No	$5.40

Software Diagram



See Software Blocks Doc for additional detail