



# Introduction to Robotics

Manipulation and Programming

## Unit 3: Sensors and Vision

SENSOR DEVELOPMENT KIT XARM (DRY LAB)

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IEEE SENIOR MEMBER



# Disclaimer

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- In the following dry lab, the instructor does not promote any product. The example development kit is chosen completely based on the convenience of promoting robot education.
- Student are not required to purchase any thing. Nor will any part of the hardware components be required to complete any part of the course assignments.
- These dry lab are designed for demonstration purpose only.



# Objective

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- Introduce a sensor development kit and assemble it.
- Give student a sense of what will be needed when a robot system is going to be developed. (Only an example)



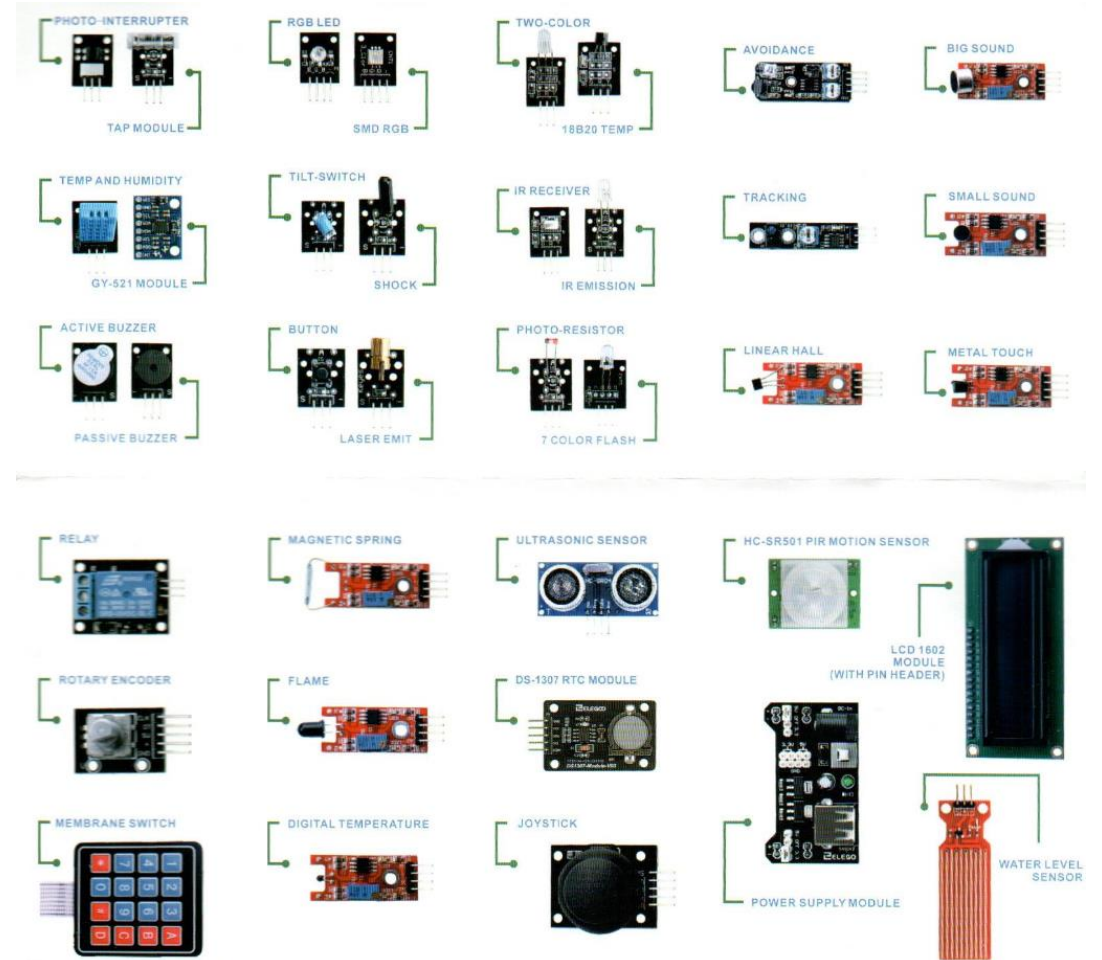
**XArm and its Secondary Development Kit (SDK)**

# Overview of SDK

## SECTION 1

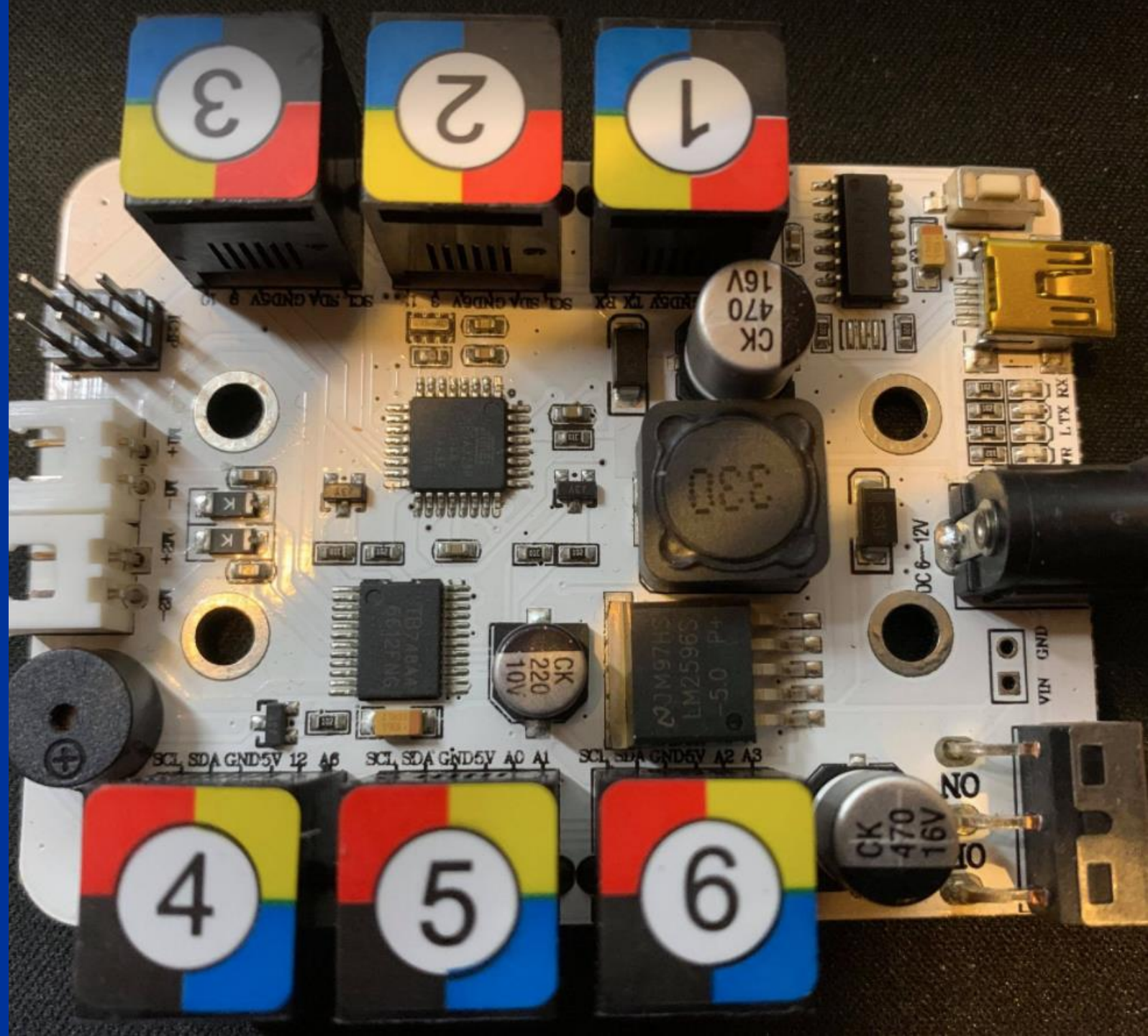
## Scratch/Arduino secondary development kit ( Extra purchase)

	1pcs		1pcs		1pcs		1pcs
Controller		Touch button module		Dot matrix board		Digital tube module	
	1pcs		1pcs		1pcs		1pcs
Infrared sensor		Infrared receiver		Infrared remote controller		Ultrasonic sensor	
	1pcs		1pcs		1pcs		1pcs
Sound sensor		RGB indicator module		Rotary knob sensor		Serial port switching module	
	1pcs		1pcs		2pcs		6pcs
Servo switching module		Micro servo		L-shaped bracket		Connection wire	



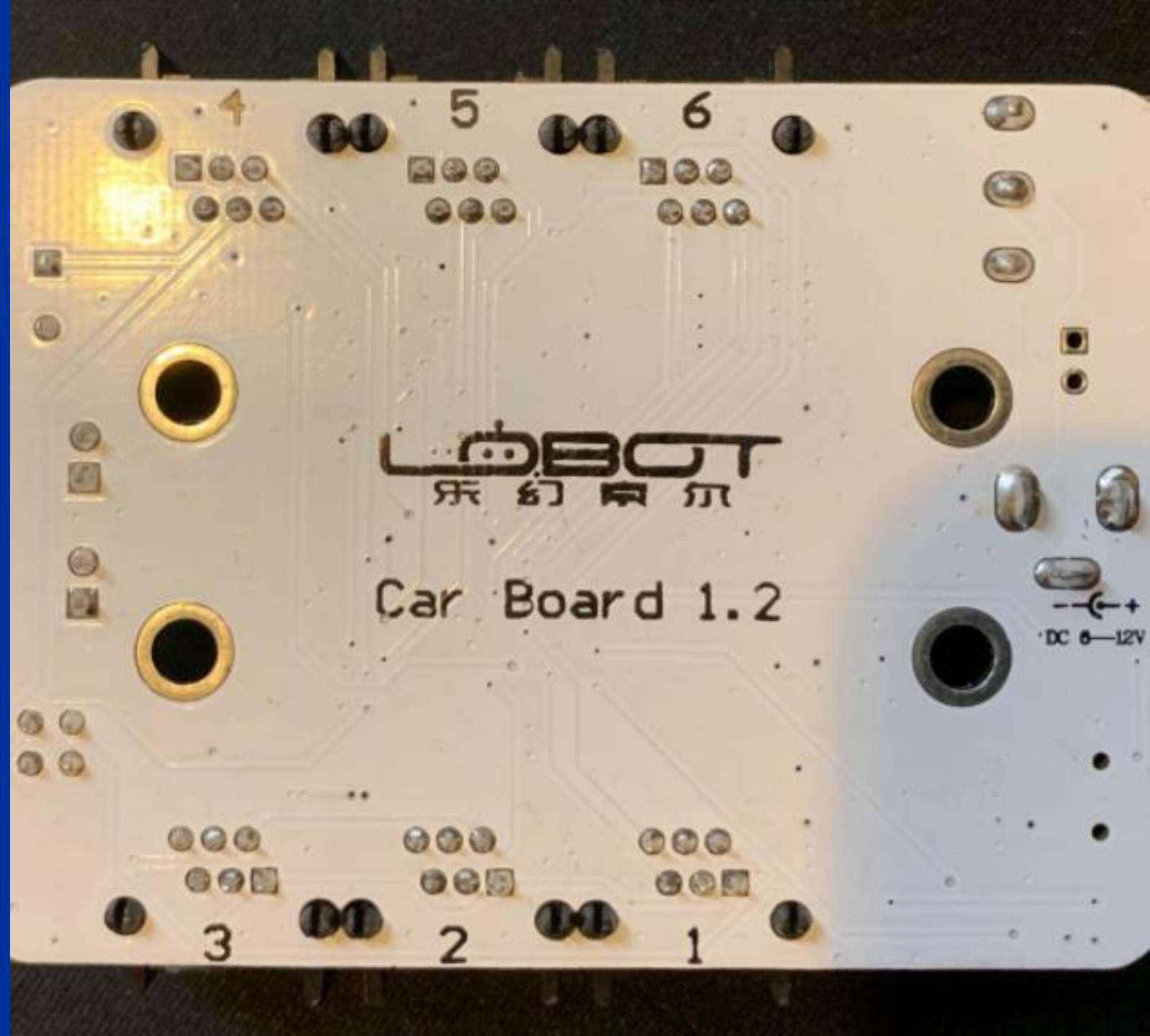


Controller  
Connect to  
Arduino  
Processor and  
XArm





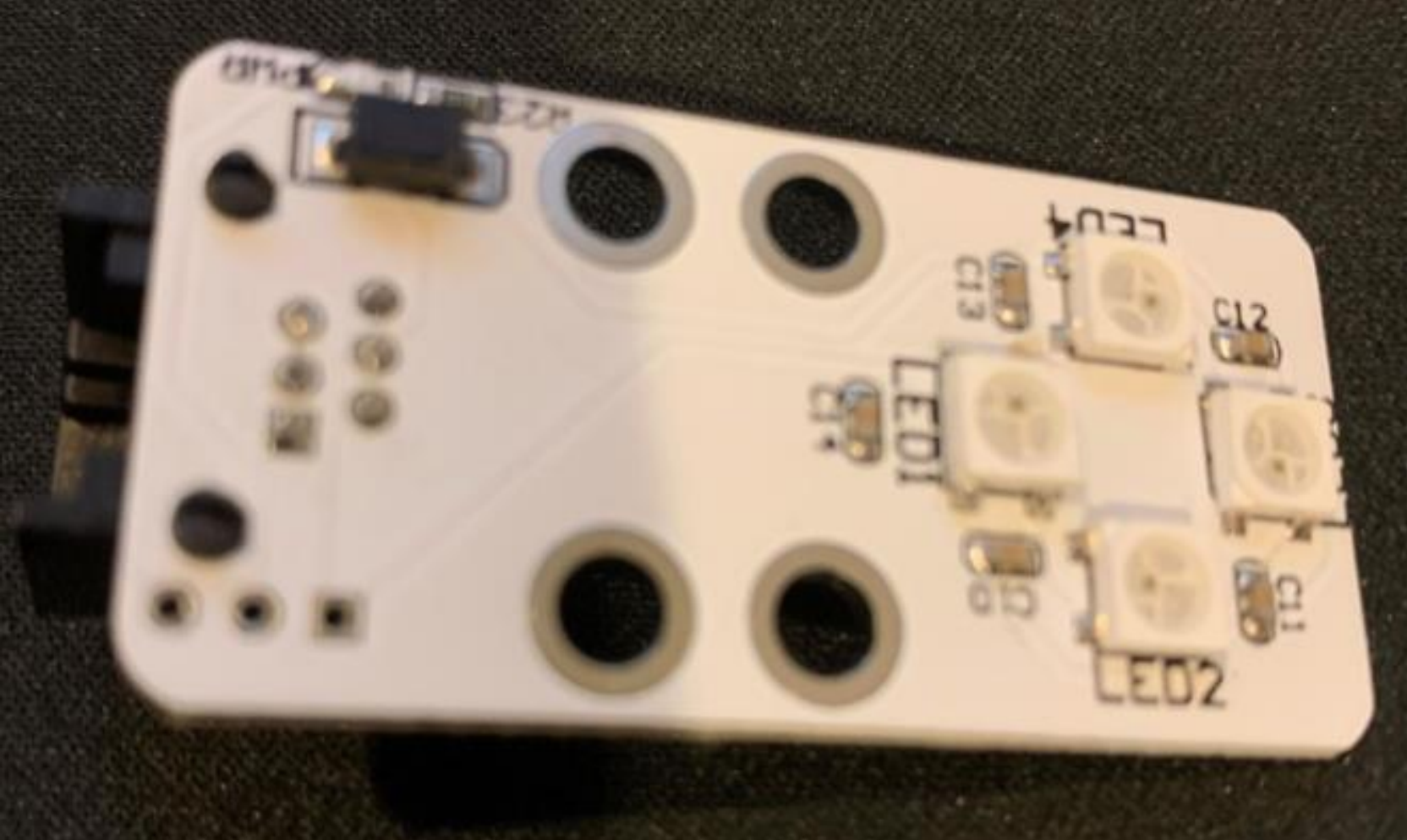
# Backview of Controller Board





# Electrical Sensors

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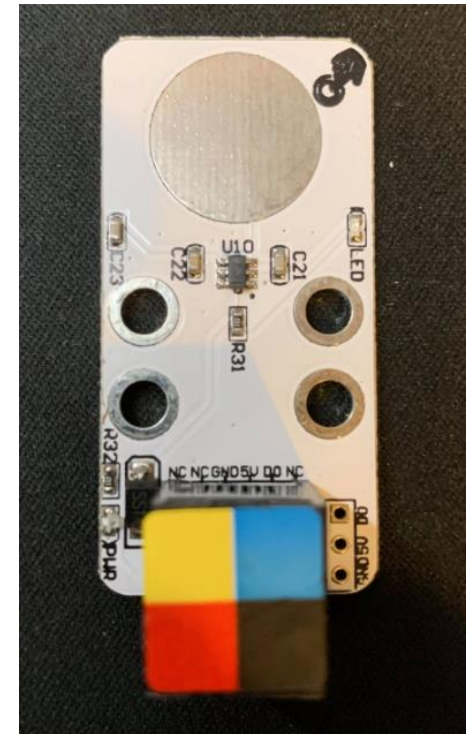
RGB LED Module



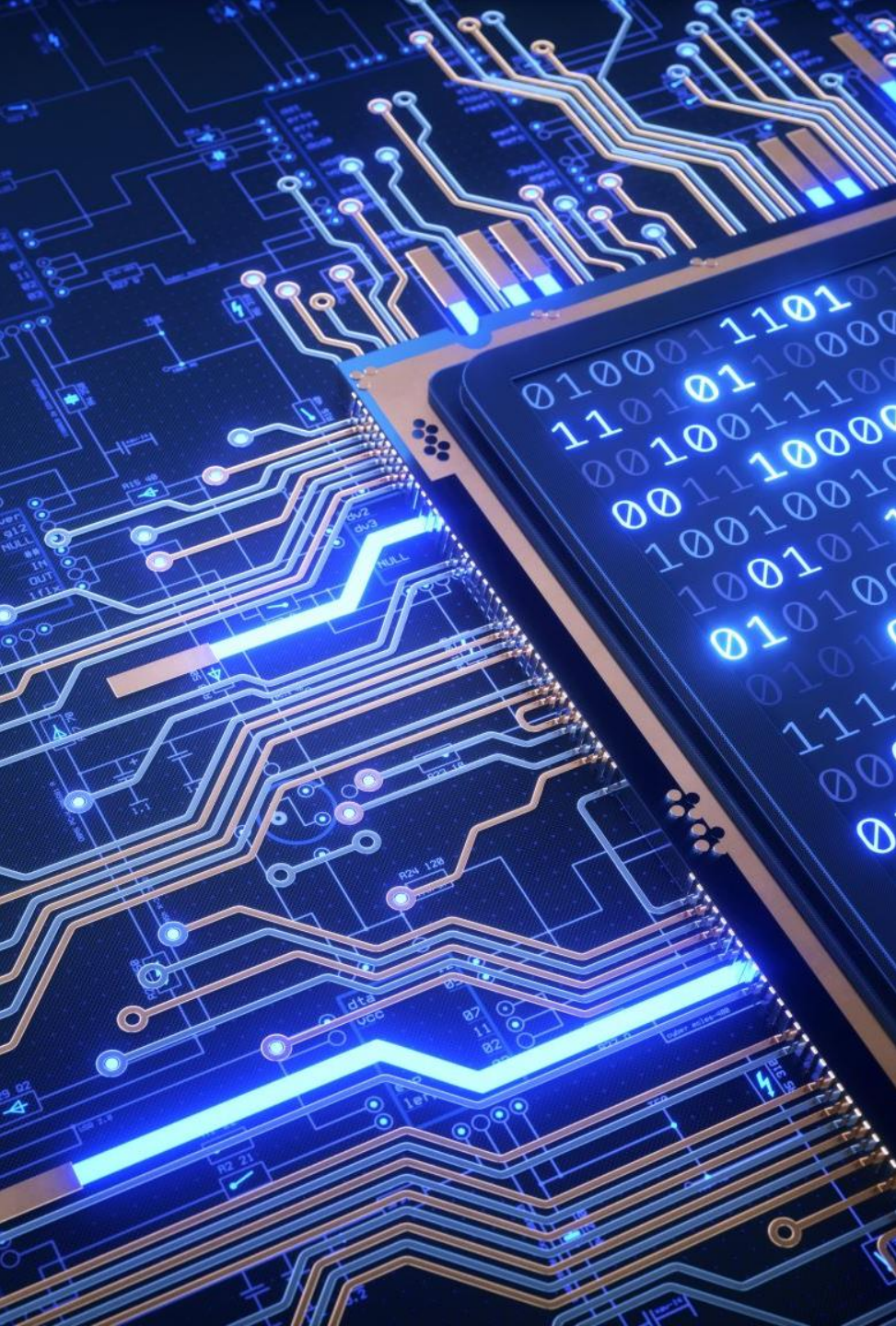
# Potentiometer Module



# Touch Button Module

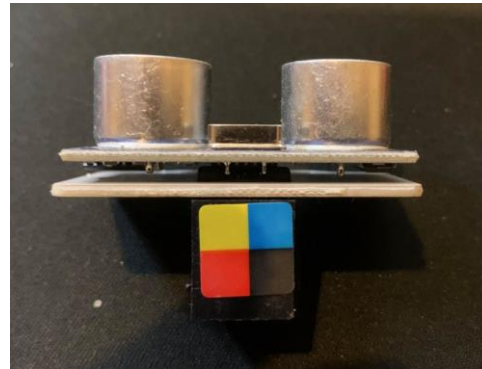
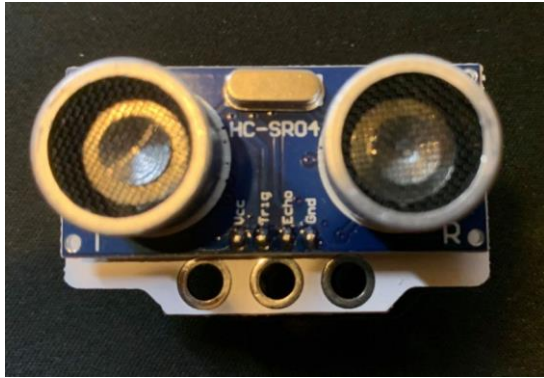
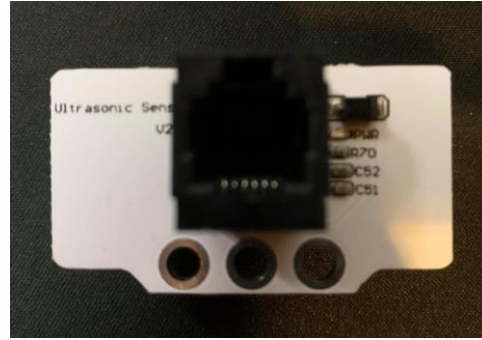
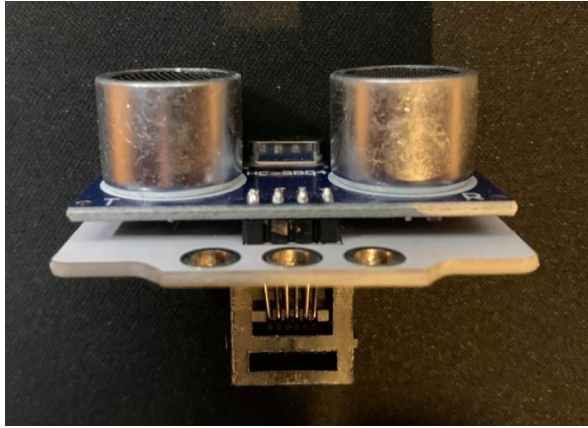






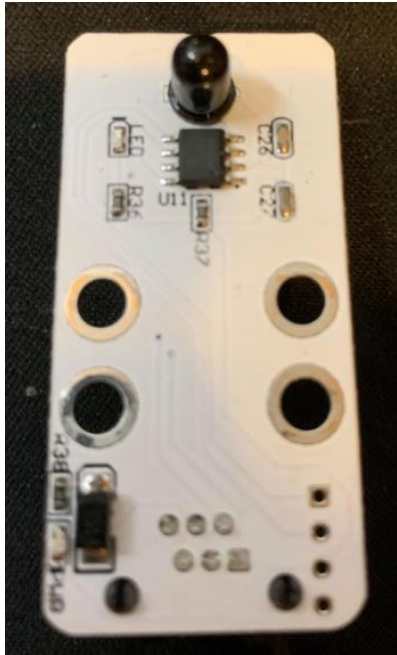
# Signal Sensors

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# Ultrasonic Sensor Module

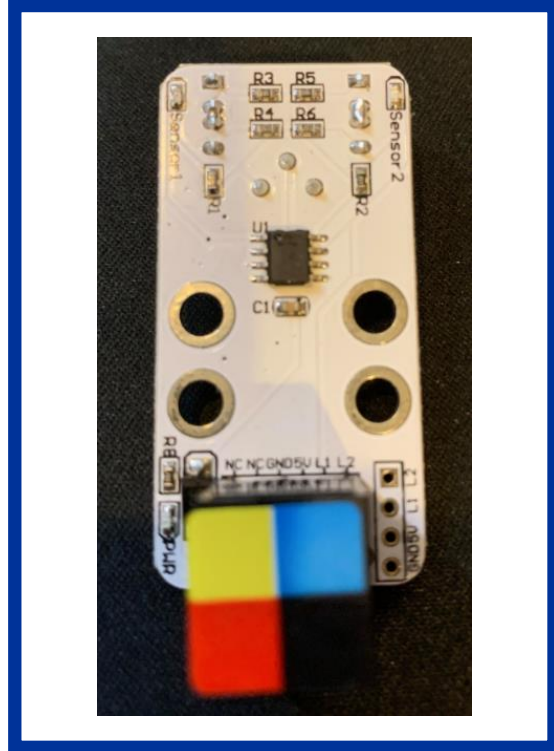
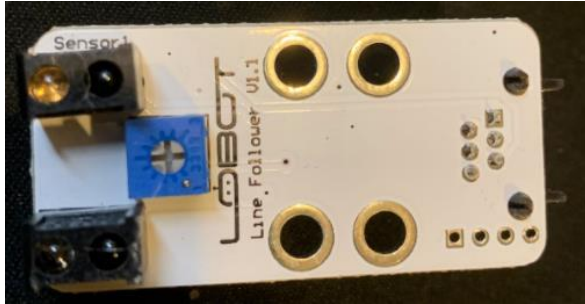
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# Infrared Receiver

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# Infrared Sensor (Connector)

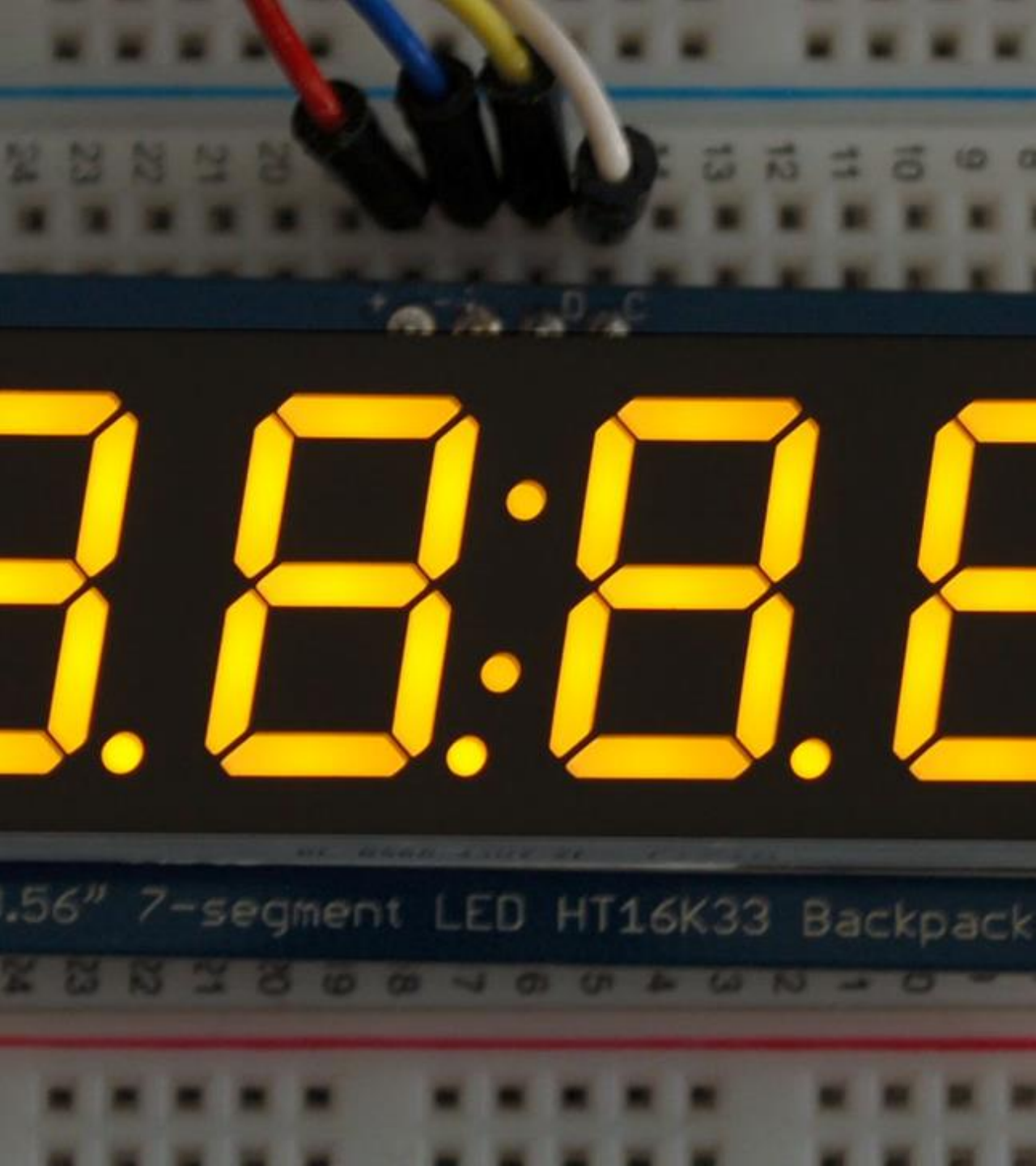
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# Sound Sensor

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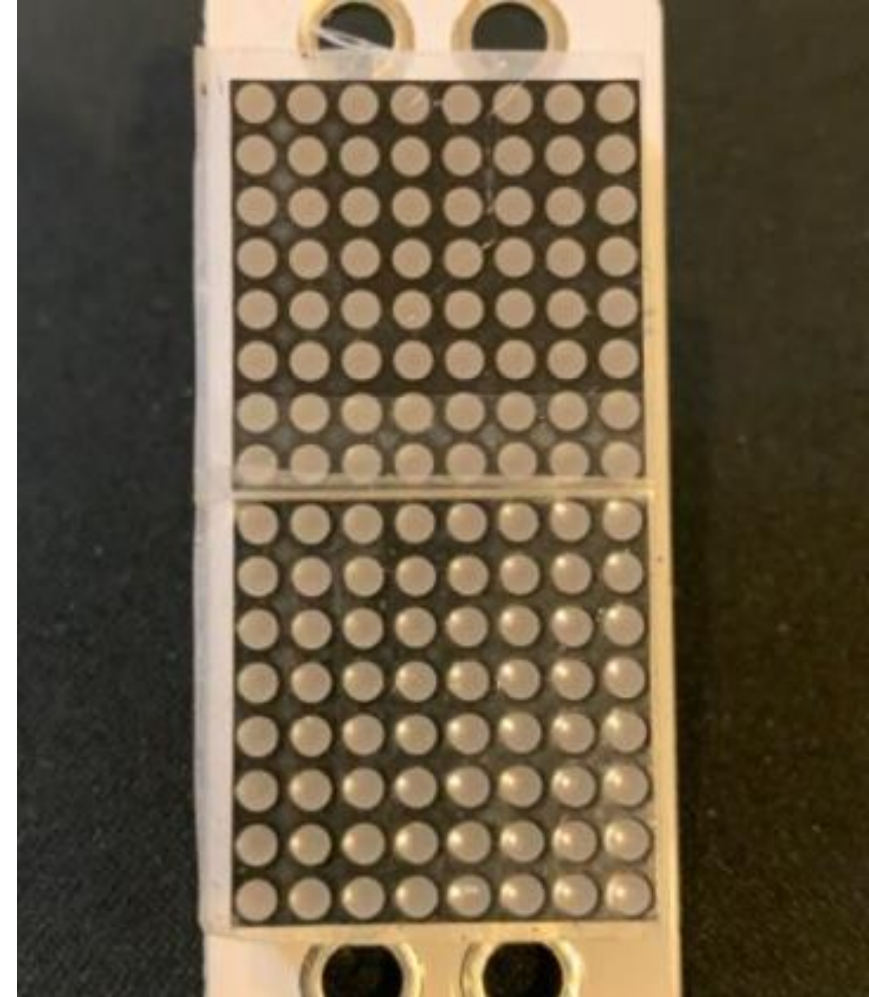
# LED Displays

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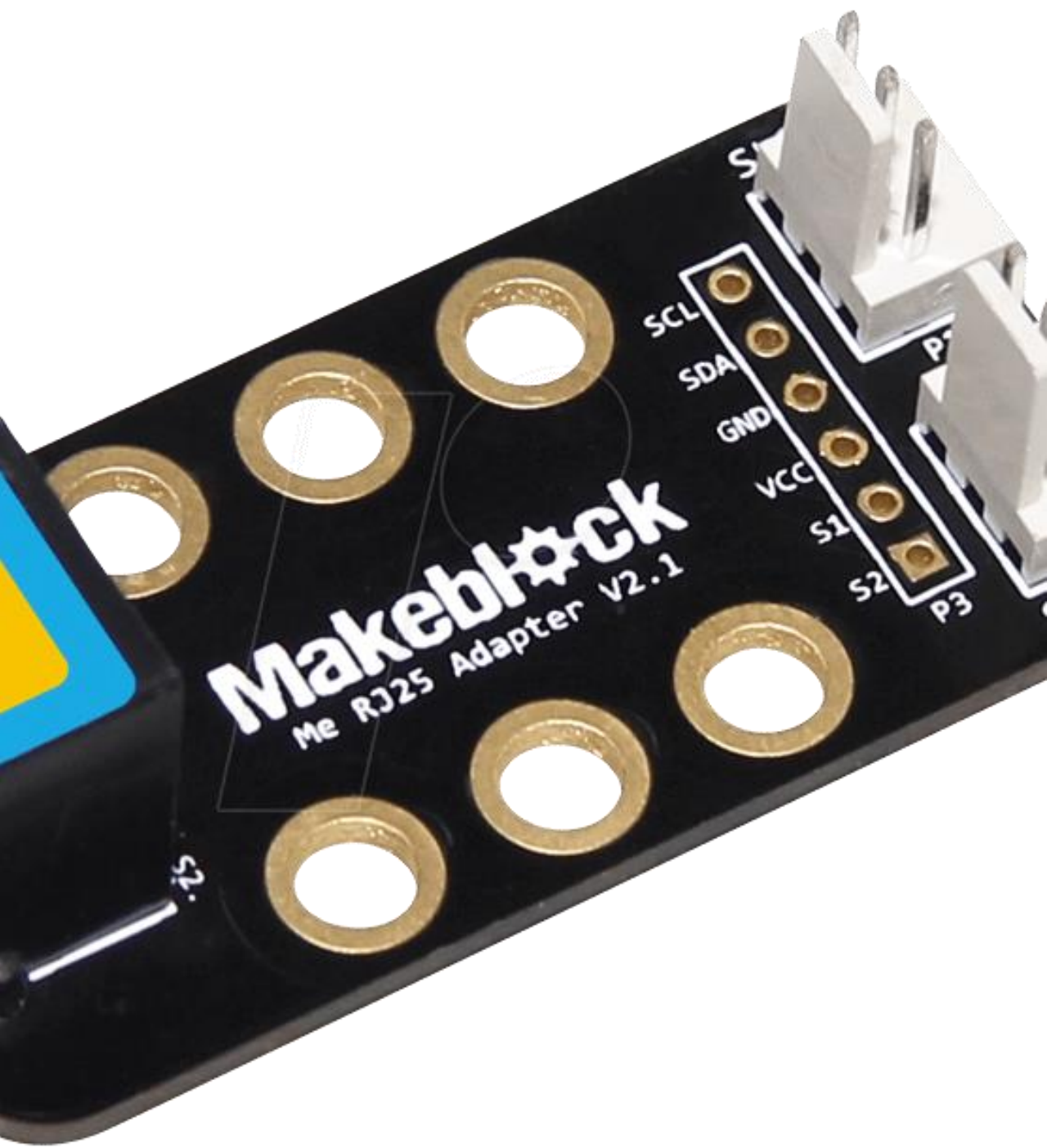


BCD Display  
Binary Coded Decimal Display





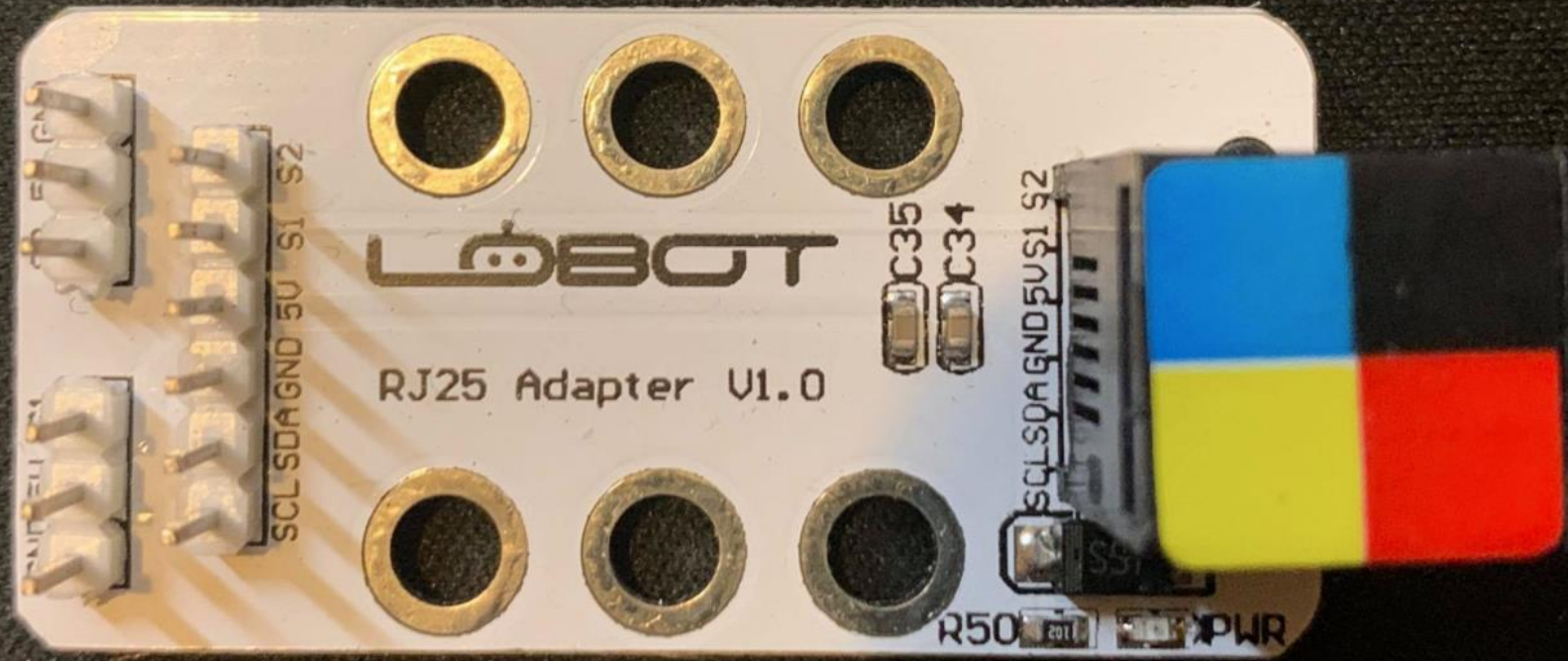
LED Matrix Display



# Connectors

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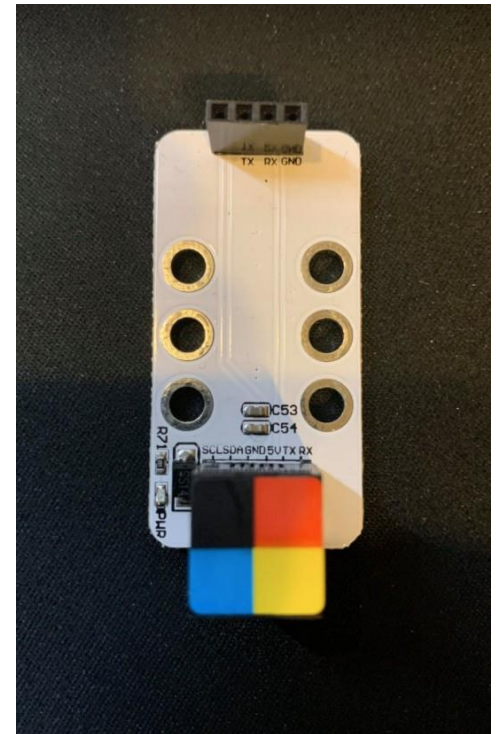




RJ 25 Adapter



# RJ25 to XArm Adapter

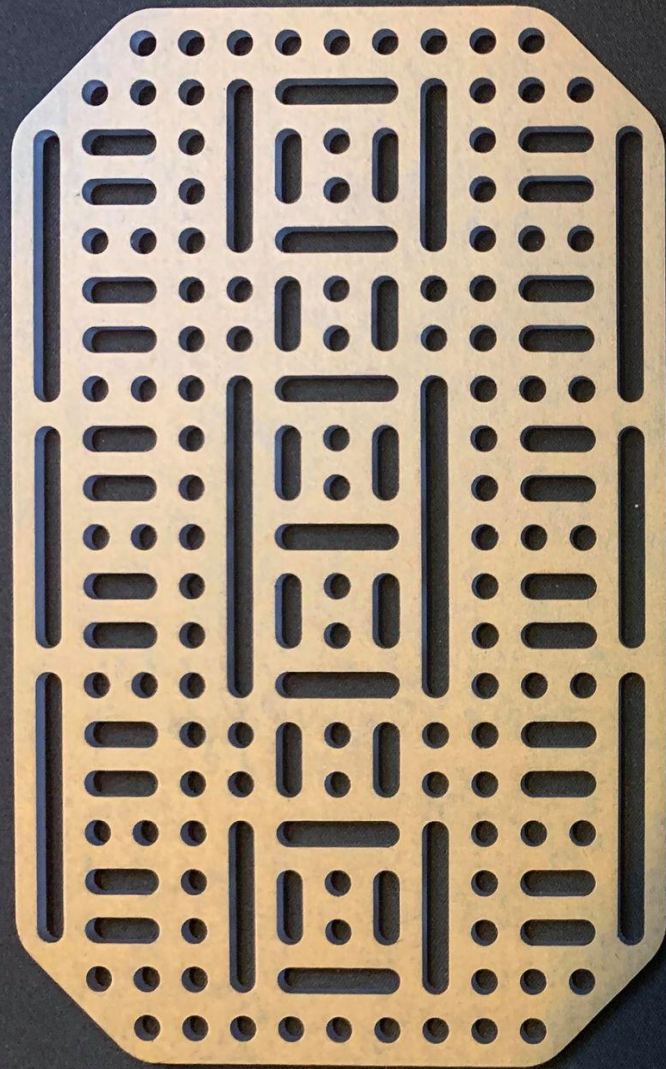


# Activity 1:

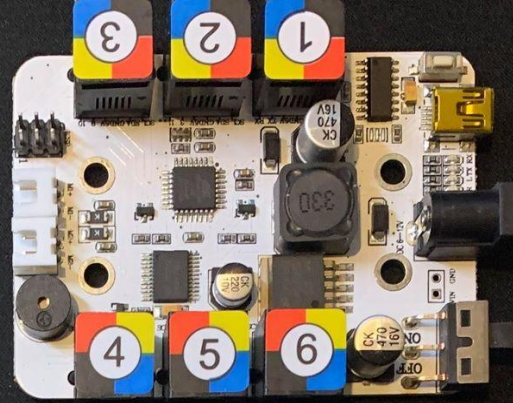
## Controller and Sensor Assembly

SECTION 2





Acrylic Board



Controller



RJ25 to XArm Adapter



Ultrasonic Sensor



L-shaped Bracket



Nuts and Screws



Wires

amazonbasics

# Action 1: Ultrasonic Sensor

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# Action 2: Controller Board

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# Action 3: Ultrasonic Unit to XArm

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# Action 4: Integration

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