Technical sheet

Abilix Robotics U kit

What's in the box?

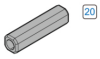
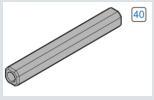
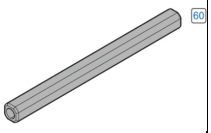
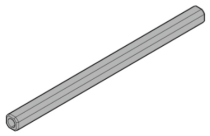
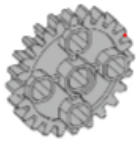
Programmable Logic Controller:
User friendly main control board. This is the brain for every project in this course. The controller manages the program signals from and to each sensor and actuator. It connects to a mobile device through a Wi-Fi connection. It offers a simple UI through an LCD touchscreen.

Main characteristics:

- RJ11 connector pins for 7 sensors, 4 motors, and 1 camera module
- Quad core Cortex-A7 processor @1.3GHz
- 1.6GB storage
- 512MB RAM
- Wi-Fi & Bluetooth modules
- 2.3” LCD touchscreen
- Embedded sensors: Gyroscope, Compass, Microphone.
- 1500mAh rechargeable Lithium battery

Structural parts:

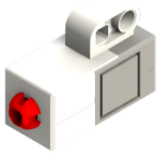
A total of **426** plastic parts are included in this kit. These structural components are meant to be assembled without the need of special tools.

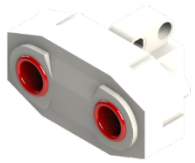
Part list				
Porous beam Black 30mm x10 	Porous beam Red 30mm x3 	Porous beam Green 30mm x3 	Porous beam Yellow 30mm x3 	Porous beam Blue 30mm x3 
Porous beam 20mm x14 	Porous beam Gray 30mm x10 	Porous beam gray 70mm x12 	Porous beam White 110mm x4 	Axle(20mm) x4 
Axle (30mm) x4 	Axle (40mm) x4 	Axle(50mm) x4 	Axle (60mm) x4 	Axle(80mm) x4 
Coupling (90°) x2 	Beam U shape x2 	Guide Wheel x2 	Mecanum Wheel x 1 	Marble x1 
Bolt(20mm) x90 	Bolt(30mm) x40 	Bolt(15mm) x18 	Axle sleeve x10 	Square beam x4 
Middle A connector x4 	Slide bearing x4 	Short bolt(2mm) x5 	Porous beam 90° x6 	Porous beam 90° x6 
Porous beam 126.87° x10 	Porous beam 126.87° x4 	Gray gear #1 x2 	Gray gear #1 x4 	Black gear #1 x8 

Black gear #2 x4 	Yellow gear #1 x2 	Yellow gear #2 x4 	Cube x20 	Half cube x6 
Cube connector x10 	Slope cube x6 	Non-slip rubber x21 	Rail x36 	Rail rim x4 
Tire x2 	Rim x2 	Cables x7 		

Sensors

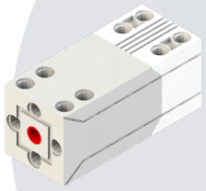
These components are used to collect data from the environment. Each sensor must be connected to the PLC board and be programmed individually.

Sensor list			
Picture	**Name**	**Quantity**	**Function**
-	Compass (embedded)	1	Using the earth's magnetic field, determines the position in which the PLC is facing.
-	Gyroscope (embedded)	1	Determines the acceleration force magnitude in X, Y and Z axis.
-	Microphone (embedded)	1	Records any environmental audio when active.
-	Position (embedded in motor)	2	Determines motor's axis actual position and RPM
	Touch	4	Recalls the current state of the button, either pressed or not.

	Ultrasonic	1	Using an ultrasonic soundwave calculates the distance between the sensor and an object in front of it. Best reads from 1 to 25in.

Actuators

These components are used to create motion within an assembly. Each actuator must be connected to the PLC board and be programmed individually.

Actuator list			
Picture	**Name**	**Quantity**	**Function**
-	RGB LED (embedded)	1	Individually controllable RGB LED light.
-	Speaker (embedded)	2	Play any sound coming from the PLC board.
	Small motor	2	Creates rotational motion at low torque and high speeds.

Minimum Hardware Requirements

Mobile Device: with Operating Systems iOS 9.3 or later or Android Oreo 8.0 or later. Memory: 8GB Minimum and RAM: 2GB Minimum.

Applications:

Download the following Apps in your device:

- Robotics U Mobile App

This application encloses every functionality the Robotics U has. The app contains introductory activities, a project gallery, interactive 3D assembly manuals, and two different block-based programming environments.

The app is available for iOS and Android users:

Apple AppStore: https://apps.apple.com/us/app/robotics-u/id1281226677
Google PlayStore: https://play.google.com/store/apps/details?id=com.partnerx.robotU

The App Includes 2 programming modules:

- Block-based Programming (Simple Coding)

This programming tool is the easiest way to start programming robotics. The user works in an environment in which there are pre-programmed blocks; each block contains a predefined sequence which makes the robot move in a certain way. In this tool, there is no chance for failure since every block has been previously proven to work. This programming method is recommended for absolute beginners.

- Advanced Coding / Scratch Coding

This programming tool uses natural language blocks to program the robot; works just as any other Scratch programming environment. If you are already familiar using Scratch, this tool will fit you best.