

FREENOVE FNK0020

Freenove Ultimate Starter Kit (Model FNK0020) for Raspberry Pi: Instruction Manual

Model: FNK0020 | Brand: FREENOVE

1. INTRODUCTION

The Freenove Ultimate Starter Kit (FNK0020) is designed to provide a comprehensive learning experience for users interested in electronics and programming with Raspberry Pi. This kit includes a wide array of electronic components and modules, along with extensive tutorials and code examples across multiple programming languages. Please note that a Raspberry Pi board is **NOT** included in this kit and must be purchased separately. Detailed tutorials and code for all projects are available for download. The download link can be found on the product box.

2. WHAT'S INCLUDED: KIT COMPONENTS

This kit contains 223 items, including commonly used electronic components, modules, sensors, and wires, enabling 128 projects from simple to complex. Below is an overview of the components:

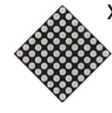
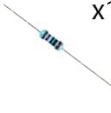
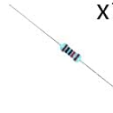
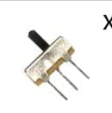
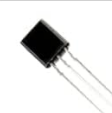
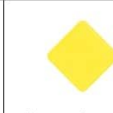
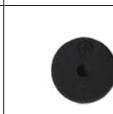
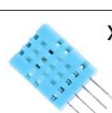
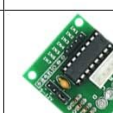
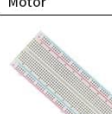
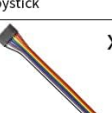
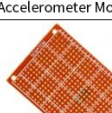
Raspberry Pi is NOT included in this kit! Download Needed: Tutorial and Code (No paper tutorial.)		 x10 Red LED	 x4 Green LED	 x4 Blue LED	 x4 Yellow LED	 x1 RGB LED	 x1 LED Bar Graph
The download link can be found on the box!		 x1 7-Segment Display	 x1 4-Digit 7-Segment Display	 x1 LED Matrix	 x20 Resistor-220	 x10 Resistor-1K	 x10 Resistor-10K
 x3 Potentiometer	 x2 Capacitor 0.1uf	 x2 Capacitor 10uf	 x6 Push Button	 x4 Big Push Button	 x1 Red Push Button Cap	 x1 Green Push Button Cap	 x1 Blue Push Button Cap
 x2 Switch	 x1 Vibration Switch	 x1 Keypad	 x2 Rectifier Diode	 x2 Switch Diode	 x2 NPN Transistor	 x6 PNP Transistor	 x1 Yellow Push Button Cap
 x1 2X AA Battery Holder	 x1 9V Battery Cable	 x1 Breadboard Power Module	 x1 Motor Driver Chip	 x3 Serial to Parallel Chip	 x1 ADC Module	 x2 Active Buzzer	 x1 Passive Buzzer
 x1 Temperature and humidity Sensor	 x1 Thermistor	 x1 Photoresistor	 x1 Relay	 x1 Motor	 x1 Servo	 x1 Stepping Motor	 x1 Stepping Motor Driver
 x1 Joystick	 x1 Infrared Motion Sensor	 x1 Ultrasonic Ranging Module	 x1 Accelerometer Module	 x1 LCD Module	 x1 GPIO Extension Board	 x1 Project Board	 x1 65 Jump Wire M-M
 x1 10 Jump Wire F-F	 x1 10 Jump Wire F-M	 x1 40 Pin GPIO Cable	 x3 General Board	 x1 40 Pin Header	 x1 Female 40 Pin Header	 x1 Resistor Color Code Card	 x1 Plastic Box

Image: Detailed view of all 223 components included in the Freenove Ultimate Starter Kit, neatly arranged and labeled.

The kit includes various LEDs (red, green, blue, yellow, RGB), 7-segment displays, LED matrix, resistors (220Ω, 1KΩ, 10KΩ), potentiometers, capacitors, push buttons, switches, vibration switches, keypads, rectifiers, transistors, battery holders, breadboard power module, motor driver chips, active and passive buzzers, temperature and humidity sensors, thermistors, photoresistors, relays, motors, servos, stepping motors, joysticks, infrared motion sensors, ultrasonic ranging modules, accelerometer modules, LCD modules, GPIO extension boards, project boards, jumper wires, and a plastic box for organization.

3. COMPATIBLE RASPBERRY PI MODELS

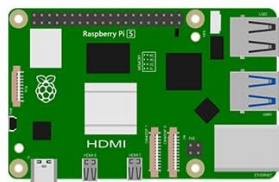
The Freenove Ultimate Starter Kit is compatible with a wide range of Raspberry Pi boards. Ensure your Raspberry Pi is one of the models listed below for optimal compatibility. The Raspberry Pi board itself is not included in this kit.

- Raspberry Pi 5
- Raspberry Pi 400
- Raspberry Pi 4B
- Raspberry Pi 3B+

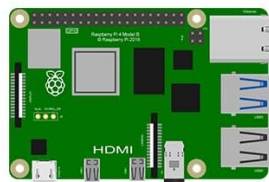
- Raspberry Pi 3B
- Raspberry Pi 3A+
- Raspberry Pi 2B
- Raspberry Pi 1B+
- Raspberry Pi 1A+
- Raspberry Pi Zero 2 W
- Raspberry Pi Zero W
- Raspberry Pi Zero

Compatible Models

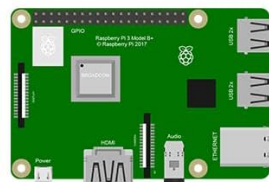
Compatible with the latest and mainstream Raspberry Pi boards.



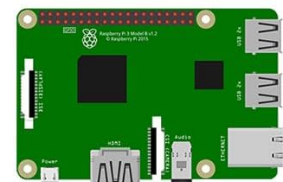
Raspberry Pi 5
(Recommended)



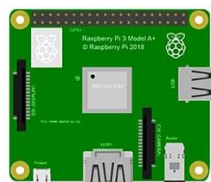
Raspberry Pi 4 Model B
(Recommended)



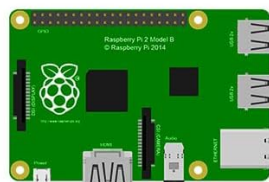
Raspberry Pi 3 Model B+
(Recommended)



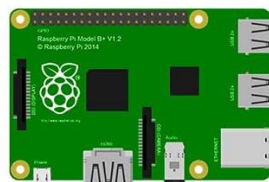
Raspberry Pi 3 Model B
(Recommended)



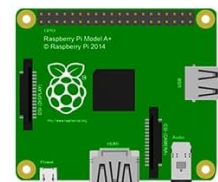
Raspberry Pi 3 Model A+



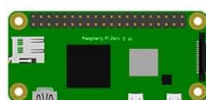
Raspberry Pi 2 Model B



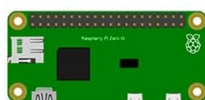
Raspberry Pi 1 Model B+



Raspberry Pi 1 Model A+



Raspberry Pi Zero 2 W



Raspberry Pi Zero W



Raspberry Pi Zero



Raspberry Pi 400
(Recommended)

Note: Raspberry Pi is NOT included in this kit.

Image: Visual representation of compatible Raspberry Pi models, including Raspberry Pi 5, 4B, 3B+, 3B, 400, Zero 2 W, Zero W, and Zero.

4. SETUP AND INITIAL CONFIGURATION

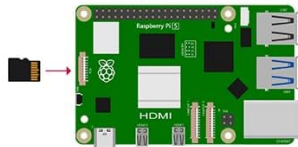
Before beginning any projects, it is crucial to set up your Raspberry Pi and download the necessary tutorials and code. The kit does not include a paper tutorial; all documentation is provided digitally.

4.1. Downloading Tutorials and Code

1. Locate the download link: The specific download link for the 962-page detailed tutorial and code files can be found on the product box.
2. Access the Freenove website: Navigate to the provided URL using a web browser.
3. Download the package: Download the compressed file containing the tutorials, code examples (Python, C, Java, Scratch, Processing), and datasheets.
4. Extract files: Unzip the downloaded file to a convenient location on your computer.

Detailed Tutorial

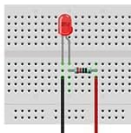
Shows you how to program the components with Raspberry Pi.



Provide step-by-step guidance on using Raspberry Pi.
Starting from installing the system.



Knowledge of electronics and components is included.
Start by lighting up an LED.



```
// led on
digitalWrite(ledPin, HIGH);
delay(1000);

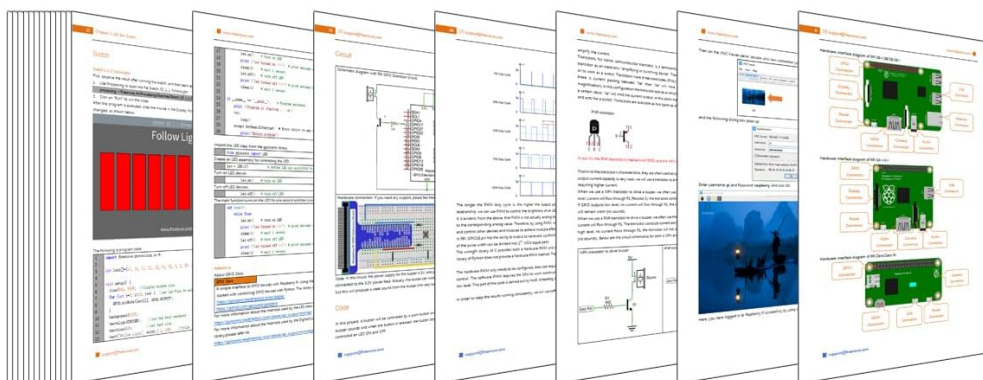
// led off
digitalWrite(ledPin, LOW);
delay(1000);
```

Dozens of projects from simple to complex are included.
Each has wiring diagrams, code and explanations.



Provide free and timely technical support services.
Feel free to contact us if you need any help.

Examples of tutorial:



The download link can be found on the box! (No paper tutorial.)

Image: Examples of the detailed digital tutorial, illustrating step-by-step guides, schematics, and code explanations.

4.2. Connecting the Raspberry Pi to the Kit

The kit utilizes a GPIO Extension Board and a ribbon cable to connect to your Raspberry Pi. Follow the specific wiring diagrams provided in the downloaded tutorial for each project. Ensure all connections are secure before powering on your Raspberry Pi.

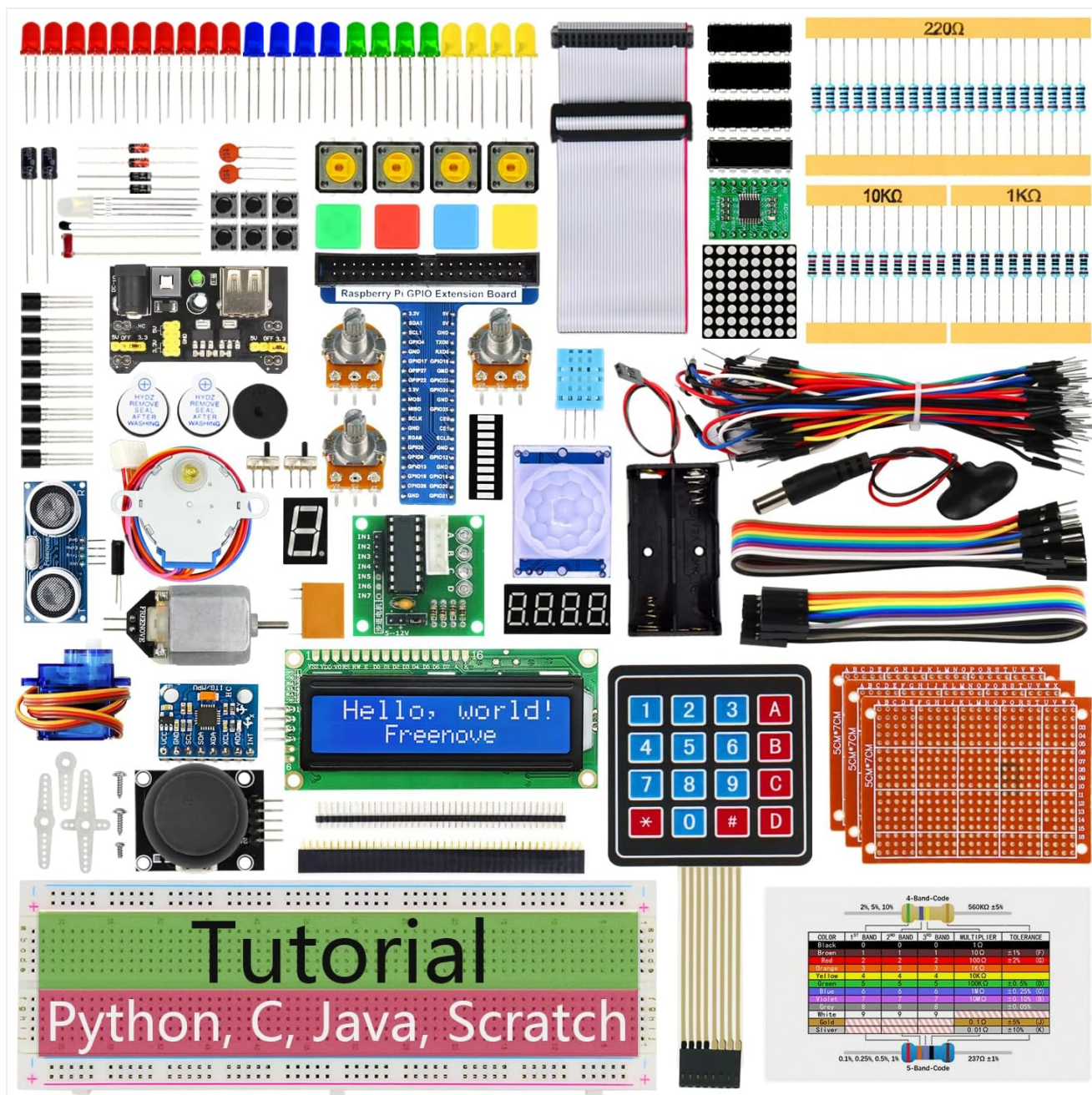


Image: The Freenove Ultimate Starter Kit components, including a breadboard and various modules, connected to a Raspberry Pi via a ribbon cable.

For a visual guide on setting up and using the kit, refer to the official Freenove video:



Video: An official Freenove video demonstrating the setup and various projects of the Ultimate Starter Kit for Raspberry Pi.

5. OPERATING THE KIT: PROJECTS AND PROGRAMMING

The kit offers 128 projects, ranging from basic LED control to more complex sensor applications and interactive games. Each project is accompanied by detailed instructions, wiring diagrams, and complete code in multiple programming languages.

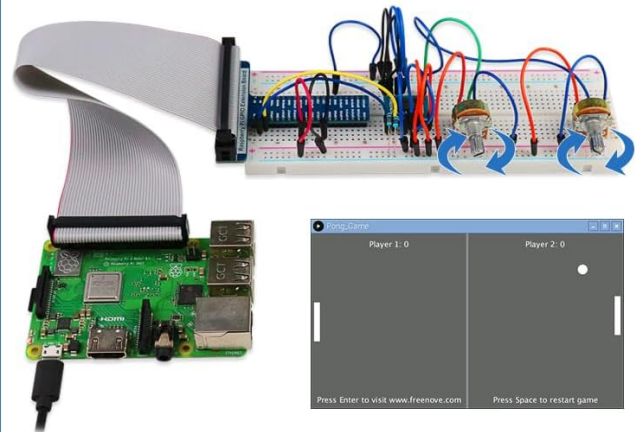
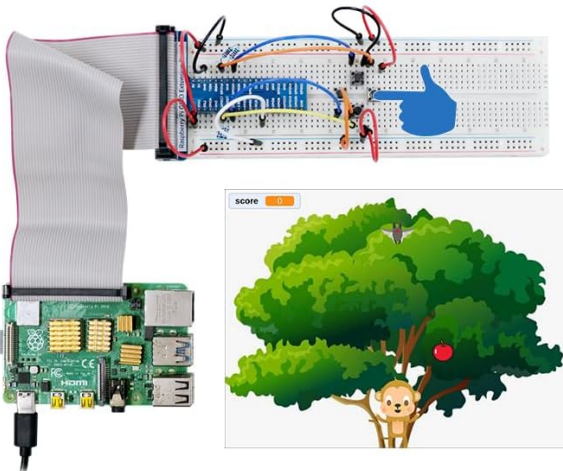
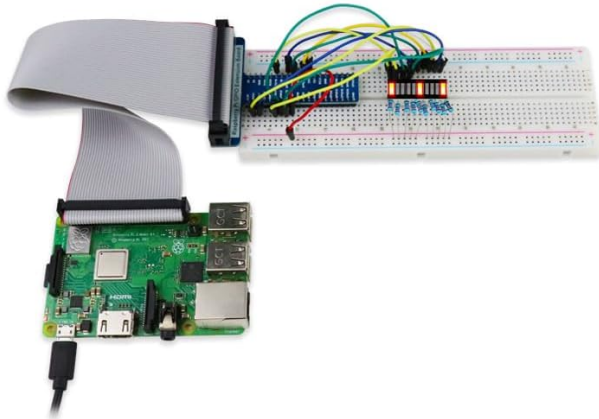
5.1. Programming Languages Supported

- **Python:** Compatible with Python 2 & 3, widely used for Raspberry Pi projects.
- **C:** A classic language for embedded systems and hardware interaction.
- **Java:** For developing robust applications.

- **Scratch:** A block-based graphical coding platform, ideal for beginners.
- **Processing:** A flexible platform for creating graphical interfaces and interactive projects.

Project Examples

Includes dozens of projects from simple to complex.



Note: Raspberry Pi is NOT included in this kit.

Image: Visual examples of the five supported programming languages (Python, C, Java, Scratch, Processing) and their application in projects.

5.2. Project Execution

For each project, the tutorial provides:

- **Schematics:** Detailed circuit diagrams.
- **Wiring Diagrams:** Visual guides for connecting components on the breadboard.
- **Complete Code:** Ready-to-use code in the supported languages.
- **Detailed Explanations:** Understanding of the project's principles and functionality.

5 Sets of Codes

Includes code for popular programming languages / coding platforms.



python™

The most popular and easy-to-use language



Language

The most classic and widely used language



Java

One of the most popular language



Processing

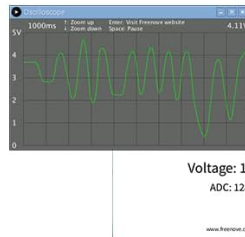
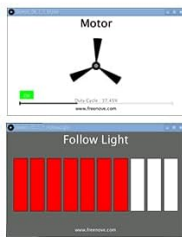
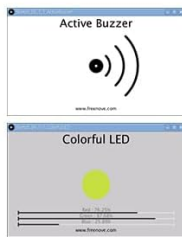
A flexible platform for graphical interface



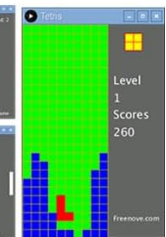
SCRATCH

Block-based graphical coding platform

Examples of Processing:



Voltage: 1.66V
ADC: 128

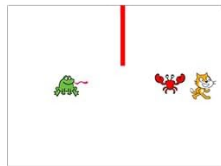


Projects

Instruments

Games

Examples of Scratch:



The download link can be found on the box! (No paper tutorial.)

Image: Several examples of completed projects, including controlling components and interactive software applications, built using the kit.

An overview of various projects and their functionalities can be seen in this video:



Video: A Freenove video showcasing different projects that can be built with the kit, demonstrating simplified wiring and various functionalities like push buttons, night lamps, LED matrices, RFID access, and ultrasonic distance measurement.

6. MAINTENANCE

To ensure the longevity and proper functioning of your Freenove Ultimate Starter Kit, please follow these maintenance guidelines:

- **Storage:** Store all components in the provided plastic box in a cool, dry place away from direct sunlight and moisture.
- **Handling:** Handle electronic components with care to avoid bending pins or damaging sensitive parts.
- **Cleaning:** Use a soft, dry cloth to clean components. Avoid using liquids or abrasive cleaners.
- **Power Management:** Always disconnect power before making or changing connections to prevent short

circuits and damage to components.

7. TROUBLESHOOTING

If you encounter issues while working with the kit, consider the following troubleshooting steps:

- **Check Connections:** Verify that all wires and components are correctly connected according to the wiring diagrams in the tutorial. Ensure firm connections.
- **Review Code:** Double-check your code for any typos or logical errors. Compare it with the provided example code.
- **Power Supply:** Ensure your Raspberry Pi and any external modules are receiving adequate power.
- **Component Orientation:** Some components, like LEDs and diodes, are polarity-sensitive. Ensure they are inserted in the correct orientation.
- **Tutorial Reference:** Refer to the detailed tutorial for specific troubleshooting tips related to each project.

If problems persist, please contact Freenove technical support for assistance.

8. SPECIFICATIONS

Feature	Detail
Brand	FREENOVE
Model Name	Freenove FNK0020
Item Model Number	FNK0020
Compatible Models	Raspberry Pi 5 / 400 / 4B / 3B+ / 3B / 3A+ / 2B / 1B+ / 1A+ / Zero 2 W / Zero W / Zero (Raspberry Pi NOT included)
Number of Items	223
Number of Projects	128
Tutorial Pages	962 (Digital download only)
Programming Languages	Python (2&3), C, Java, Scratch, Processing
Item Weight	1.21 pounds
Package Dimensions	8.23 x 5.83 x 1.85 inches

9. WARRANTY AND SUPPORT

Freenove is committed to providing high-quality products and excellent customer service. While specific warranty details are not provided in this manual, Freenove offers free and timely technical support for all its products.

9.1. Technical Support

If you require assistance with your kit, including questions about components, tutorials, or troubleshooting, please contact Freenove's technical support team. When contacting support, it is helpful to provide the following information:

- Your computer's operating system (Windows, Mac, Linux)
- The name of your Freenove kit (Ultimate Starter Kit FNK0020)
- The specific project number and page from the tutorial
- A detailed description of the issue you are experiencing, including any error messages or unexpected behavior.

You can reach Freenove support via email at atsupport@freenove.com.



Video: A SunFounder video highlighting the availability of 161 free online tutorials in 5 programming languages (Python, C, Java, Node.js, and Scratch) for their Raspberry Pi Ultimate Kit, demonstrating various projects like a speech clock, camera with shutter, attendance system, reversing alarm, password lock, and fruit piano.