User Manual

Template version

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1. Introduction

Global explanation about Frogger FPGA version purpose, the overview of the product and content of the manual.

1.1 Product Overview:

The **Frogger Game** is a recreation of the classic arcade game, designed to be played on a custom FPGA board using a Go-board for controls. The goal is to navigate the frog safely across the road and river to reach the other side.

1.2 Manual Content:

The user manual contain this following content:

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2. Safety Information

Before using the product, read the following safety precautions:

- Ensure that the FPGA and Go-board are placed on a stable surface.
- Avoid touching exposed electrical components while the system is powered.
- Disconnect power before making any hardware changes.
- Handle all components with care to avoid damage.

3. System Requirements

To ensure proper functionality, verify that you have the following:

- **Hardware**:
  - Go Board (https://nandland.com/the-go-board/)
  - Micro USB wire
  - HDMI-compatible display (for game visuals)
  - HDMI wire with VGA adaptor
- **Software**:
  - FPGA design software (e.g., Quartus or Vivado)
  - Pre-programmed bitstream file for the game
  - Python 3.9 at least
  - APIO
  - Driver libusbK (v3.1.0.0) install on the Go Board

4. Hardware Setup

Follow these steps to set up your hardware:

Step 1: Connect Go Board to Power

- Plug a micro USB wire on this indicated port (see the Go Board plan at the bottom of this page).

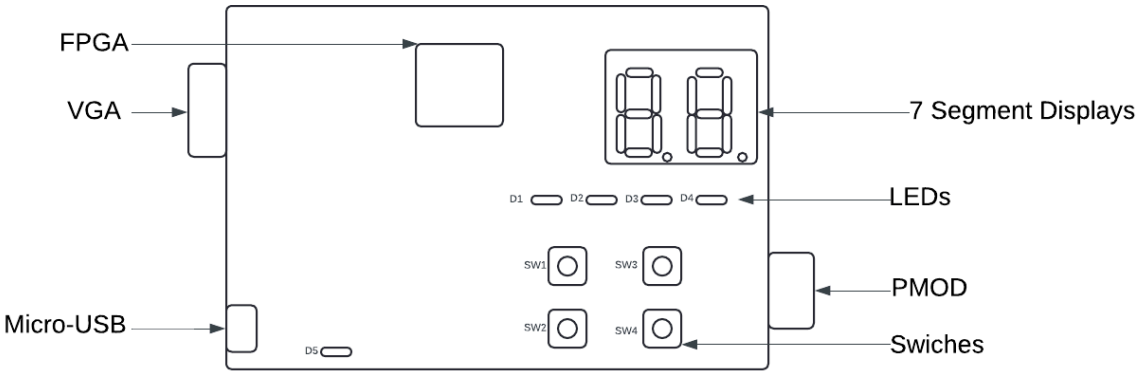
Step 2: Connect HDMI to Display

- Use the HDMI cable to connect the Go Board to your display and plug it on the VGA port (see the Go Board plan at the bottom of this page).

Step 3: Power On

- Power on the Go Board and ensure the power indicator light is on (D5 LED).

Note: Ensure all connections are secure before powering on.



5. Software Installation

Step 1: Clone the Github repository

- Clone this following repository → `git clone https://github.com/algosup/2023-2024-project-5-flutter-team-6/tree/main`

Step 2: Install Python

- Download Python on this following link: https://www.python.org/downloads/

Step 3: Install APIO

- Once Python was installed, in theTerminal on **MAC** OR run cmd.exe in administrator mode on **Windows**, type the following command → `-m pip install apio`.
- Install all package with this command → `apio install -a`

Step 4: Install Driver

- Plug in the Go Board to the computer.
- Enable driver using this command → `apio drivers --ftdi-enable`
- **Windows only:** A window called Zadig should appear.At first, go to the Option button → list all devices. From the dropdown, select Dual RS232-HS (Interface 0) and libusbk form the Driver dropdown.
- **Windows only:** Click on replace Driver button.
- **Windows only:** Wait a couple minutes until the process is over.
- **Windows only:** After the pop up appeared with “The driver was installed successfully.” , click on close and leave the window.
- Unplug and plug the Go Board again. The setup is ready.

Step 5: Build and Execute the Software

- Plug in the Go Board to the computer.
- Go the terminal on **MAC** or cmd.exe on **Windows** go to same path as the GitHub repository source code → `\2024-2025-project-1-fpga-team-5\src`
- Type → `apio upload`
- Now the Go Board has the program inside and is ready to use the software while the device is powered ON.

6. Getting Started

Now that the hardware is set up and software is installed, you're ready to play the game.

Step 1: Launch the Game

- Upon booting the FPGA, the Frogger game should start automatically, and the game's main menu will appear on the display.

Step 2: Use the Go-board to Navigate

- The Go-board buttons correspond to directional inputs for the game:
    - **Up Button**: Move frog up
    - **Down Button**: Move frog down
    - **Left Button**: Move frog left
    - **Right Button**: Move frog right

7. How to Play

Objective:

Navigate your frog across the busy road and the river, avoiding obstacles such as cars and falling into the water.

Controls:

Use the Go-board buttons to move the frog:

- **Move Up**: Press the upper-left button
- **Move Down**: Press the lower-left button
- **Move Left**: Press the lower-right button
- **Move Right**: Press the upper-right button

Game Over:

The game ends if the frog is hit by a car or falls into the water. To restart the game, press the **reset** button on the FPGA.

8. Troubleshooting

If you encounter any issues, refer to this section for solutions.

Problem: No Display Output

- **Solution**: Verify that the HDMI cable is connected correctly. Check the power status of the FPGA.

Problem: Go-board Inputs Are Not Responding

- **Solution**: Ensure that the Go-board is securely connected to the FPGA. Reboot the FPGA to reinitialize the connection.

Problem: Game Crashes or Freezes

- **Solution**: Press the reset button on the FPGA to restart the game. If the problem persists, reload the bitstream file using the FPGA design software.

9. FAQs

- **Q: Can I modify the game?**
    - **A**: Yes, the game code can be modified through the provided FPGA software (e.g., Quartus or Vivado). Detailed instructions can be found in the Developer's Guide.
- **Q: Can I use a different control interface?**
    - **A**: While this version uses the Go-board, you can adapt the controls by modifying the input pins in the FPGA design.

10. Warranty and Support

If you experience issues with the product, you are covered under a 1-year warranty. Contact our support team at **support@example.com** for assistance. Be sure to have your purchase details on hand.

For additional help or replacement parts, visit our support website: www.example.com/support

Thank you for choosing our FPGA-based Frogger game! Enjoy the classic arcade experience.