User Manual: Joystick2PPM

1. Introduction

Joystick2PPM is a high-performance Android application that allows you to control RC models using a Logitech Extreme 3D Pro joystick. It converts the joystick movements and button presses into a PPM (Pulse Position Modulation) signal via a connected PiKoder USB device, which can then be plugged into the trainer port of your RC transmitter or directly into a RF module.

2. Prerequisites

To use this application, you will need:

- **Android Device**: A smartphone or tablet running Android 7.0 (Nougat) or higher with USB Host (OTG) support.
- **USB OTG Adapter**: To connect USB devices to your Android device's charging port.
- **USB Joystick**: Logitech Extreme 3D Pro
- **PiKoder USB-PPM Converter**: The hardware interface that generates the PPM signal.

3. Getting Started

3.1 Hardware Connection

1. Connect your **Joystick** and the **PiKoder USB-PPM device** to your Android device using a USB Hub and an OTG adapter.
2. Launch the **Joystick2PPM** application.
3. The application will prompt for permission to access the USB devices. Grant permission for both the Joystick and the PiKoder.

3.2 Connection Status

Look at the status indicators (colored dots) on the dashboard:

- **Green**: Device is connected and active.
- **Red**: Device not detected.
- **Yellow (PiKoder only)**: PiKoder is connected, but the Joystick is not sending data.

4. The Dashboard

The interface is divided into two main sections:

4.1 Joystick Controls (Left Side)

- **Axis Monitors**: Visual bars show the current position of the X, Y, Z, and Rx axes.
- **Hat Visualizer**: A 2D box tracks the position of the 8-way hat switch (POV).
- **Button Indicators**: 12 numbered boxes light up green when the corresponding joystick button is pressed.

4.2 Servo Outputs (Right Side)

- **Channel List**: Shows the 8 available PPM output channels.
- **Output Bars**: Display the actual signal value (0-255) being sent to the PiKoder.

5. Configuration

5.1 Mapping Channels

Each of the 8 output channels can be assigned to a specific joystick input:

1. Tap the **Input Selector** (the dropdown menu) next to the channel number.
2. Select the desired source:
    i. **Rx, X, Y, Z**: Primary joystick axes.
    ii. **Flight Mode**: A signal based on the currently selected flight mode (1-6).
    iii. **Hat**: The vertical position of the hat switch.
    iv. **B1 - B12**: Specific joystick buttons. 3. If you select an input already assigned to another channel, the application will automatically **swap** the mappings to prevent conflicts.

5.2 Reversing and Toggling

The **"rev"** column behaves differently depending on the input type:

- **For Axes**: Checking the box inverts the signal direction (e.g., pushing up becomes signal down).
- **For Buttons**: Checking the box enables **Toggle Mode**.
    - *Unchecked*: The channel output is maximum PPM pulse width of 2ms while the button is held, and 0 when released (Momentary).
    - *Checked*: Pressing the button once switches the channel output to maximum PPM pulse width of 2ms and keeps it there. Pressing it again switches it back to 0 (Toggle/Latch).

5.3 Flight Modes

The application supports 6 discrete flight modes. - **Activation**: Use joystick buttons **7 through 12** to instantly switch to Flight Mode 1 through 6. - **Mapping**: Assign “Flight mode” as an input to any servo channel. The output value will change in steps corresponding to the active mode (e.g., Mode 1 = Low, Mode 6 = High).

6. Persistence

All mappings, reversal settings, and the last selected flight mode are **automatically saved**. When you restart the application, your previous configuration will be restored immediately.

7. Troubleshooting

- **No Joystick Data**: Ensure the OTG adapter is fully plugged in. Some phone cases prevent a secure connection.
- **PiKoder Not Connecting**: If the indicator stays red, try unplugging and re-plugging the PiKoder.
- **Screen Turning Off**: The app is designed to keep the screen on during use, but ensure you have sufficient battery or are connected to a power source via a charging hub.
- **Lag/Latency**: Ensure no heavy background apps are running. The app is optimized for high-speed control (50Hz), but extreme system load can affect performance.