BLUETOOTH CONTROLLED UGV THROUGH THE ANDROID APPLICATION

GADDAM LIKHITHESHWAR

March 28, 2023

Contents

Abstract

This manual shows how to control the UGV through the android application using Bluetooth and display on the seven segment according the controls in the android app.

1 Components

Components	Values	Quantity
Vaman Bord		1
JumperWires	M-F, F-F	15
Breadboard		1
UGV-kit		1
Seven-Segment display		1
Resistor	220	1
Motor Driver IC	L293	1
USB-UART		1

2 Implementation

1. Connect the USB-UART pins to the Vaman ESP32 pins according to Table

VAMAN LC PINS	UART PINS
GND	GND
ENB	ENB
TXD0	RXD
RXD0	TXD
0	IO0
5V	5V

2. Follow the instructions which are given below:

```
# To copy repository
svn co https://github.com/likhith1101/fwcassgn/
    trunk/Bluetooth-controlled-ugv
cd Bluetooth-controlled-ugv

# To build ESP32 firmware
cd esp32_pwmctrl
pio run
# To flash ESP32 firmware, connect usb-uart
    adapter
pio run -t nobuild -t upload
# If using termux, use scp to send .pio/build/
    esp32doit-devkit-v1/firmware.bin to PC

# To build m4 firmware
cd m4_pwmctrl/GCC_Project
# modify line 140 of config.mk to setup path to
    pygmy-sdk or qorc-sdk
# default path is /data/data/com.termux/files/home
    /pygmy-dev/pygmy-sdk
make
# If using termux, Use scp to send output/
    m4_pwmctrl.bin to PC

# To build fpga source
cd fpga_pwmctrl/rtl
ql_symbiflow -compile -d ql-eos-s3 -P pu64 -v
    *.v -t AL4S3B_FPGA_Top -p quickfeather.pcf
    -dump jlink binary
# If using termux, use scp to send
    AL4S3B_FPGA_Top.bin to PC

# To flash eos s3 soc, connect usb cable to vaman
    board
sudo python3 <Type path to tiny fpga programmer
    application> --port /dev/ttyACM0 --
    appfpga AL4S3B_FPGA_Top.bin --m4app
    m4_pwmctrl.bin --mode m4-fpga --reset
```

3. After uploading the code in the vaman board as per the given instructions, then download the Dabble apk and install it on the Android Mobile and give the necessary permissions.
4. On Android Mobile, open the Dabble application.Select gamepad option in the app and then select joystick mode.
5. Connect esp32 by clicking bluetooth icon in the app, which enables bluetooth and esp32 will get connected.
6. Now connect the Seven Segment to the Vaman board according to the given connection given in the table

VAMAN PINS	SEVEN SEGMENT PINS
IO-32	a
IO-33	b
IO-25	c
IO-26	d
IO-27	e
IO-14	f
IO-12	g

Now you can observe the changes on sevensegment display for every key pressed on the joystick on the android application