EE 326: Electronic System Design 1

WiFi Module API

Firmware version 1.0

This document describes the UART API for the WiFi module firmware. All commands issued must end with a carriage return and a newline character. The **Response** specification indicates what is returned to the MCU UART, not the debugging UART. The debugging UART may show more information. Any invalid command will get a response of "invalid command" to both the MCU UART and the debugging UART.

1 System

- Perform UART test.
  - **Command**: test
  - **Action**: None
  - **Response**: SUCCESS
- Get firmware version.
  - **Command**: ver
  - **Action**: Prints <VERSION_NUMBER> to the debugging UART.
  - **Response**: None
- Get MAC address of ESP32.
  - **Command**: get mac
  - **Action**: Prints MAC address to debugging UART.
  - **Response**: None
- Set SPI baud rate.
  - **Command**: set spi_baud <BAUD_RATE>
  - **Action**: Set SPI baud rate to <BAUD_RATE>.
  - **Response**: None
- Transfer image.
  - **Command**: image_transfer <LENGTH_IN_BYTES>
  - **Action**: Activate controller SPI transfer of <LENGTH_IN_BYTES> bytes. Make sure the peripheral is ready for transfer.
  - **Response**: None
- Start WiFi provisioning mode on ESP32.
  - **Command**: provision
  - **Action**: Starts provisioning mode on ESP32. This configures the ESP32 as an access point with SSID "ESD1 XY", where X is the fifth byte of the MAC address and Y is the sixth byte of the MAC address. When you connect to this access point, you will be taken to a captive portal that will allow you to configure your network. When provisioning is complete, the ESP32 will boot into its normal mode of operation.
  - **Response**: None

2 GPIOs

- Configure network GPIO.
  - **Command**: set net_gpio <PIN_NUM>
  - **Action**: Set the pin indicated by <PIN_NUM> to indicate whether the ESP32 is connected to the internet. If there is a connection, the pin outputs HIGH. Otherwise, it outputs LOW.
  - **Response**: None
- Configure websocket clients GPIO.
  - **Command**: set clients_gpio <PIN_NUM>
  - **Action**: Set the pin indicated by <PIN_NUM> to indicate whether any clients are connected to the websockets server hosted by the ESP32, indicating that someone is watching the video stream. If any clients are connected, the pin outputs HIGH. Otherwise, it outputs LOW.
  - **Response**: None
- Configure command complete GPIO.
  - **Command**: set comm_gpio <PIN_NUM>
  - **Action**: Set the pin indicated by <PIN_NUM> to indicate when an API command has finished being received and processed. At the start of processing, this pin goes LOW. When processing is complete, this pin goes HIGH. Therefore, the MCU can sense the rising edge to indicate when it is safe to proceed to the next command.
  - **Response**: None

3 Indicators (LEDs)

- Configure network indicator.
  - **Command**: set wlan_gpio <PIN_NUM>
  - **Action**: Set the pin indicated by <PIN_NUM> to indicate the status of the network connection. Short blinks (125ms) indicate no connection. Long blinks (1s) indicate a connection. If <PIN_NUM> is specified as "off", then the indicator is disabled.
  - **Response**: None
- Configure websocket connection indicator.
  - **Command**: set websocket_gpio <PIN_NUM>
  - **Action**: Set the pin indicated by <PIN_NUM> to indicate the status of the websockets connections (i.e. whether clients are connected or not). Short blinks (125ms) indicate no connections. Long blinks (1s) indicate at least one connection. If <PIN_NUM> is specified as "off", then the indicator is disabled.
  - **Response**: None
- Configure provisioning indicator.
  - **Command**: set ap_gpio <PIN_NUM>
  - **Action**: Set the pin indicated by <PIN_NUM> to indicate the status of provisioning mode. Short blinks (125ms) indicate that provisioning mode is active but no clients have connected to the access point. Long blinks (1s) indicate that provisioning mode is active an a client has connected to the access point. When provisioning is complete, the indicator turns off. If <PIN_NUM> is specified as "off", then the indicator is disabled.
  - **Response**: None