ODROID ESP12E Smart Power 2 with 15V 4A Adapter Instruction Manual

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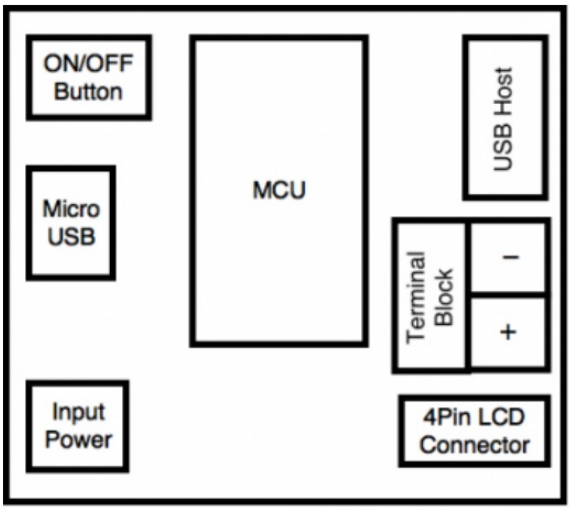
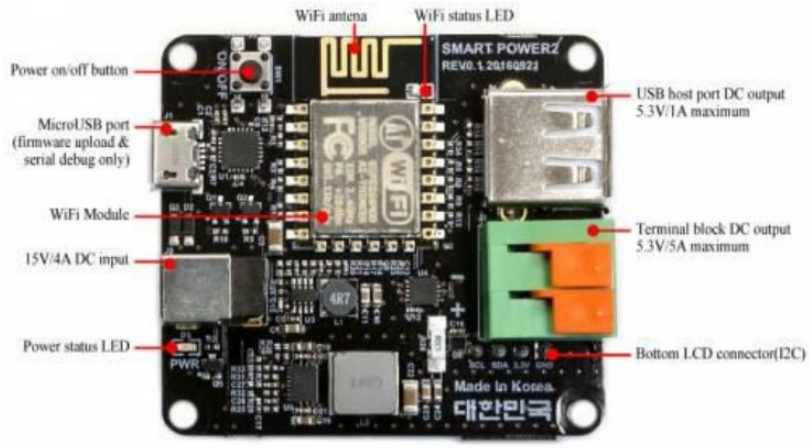
Contents hide

Android Smart Power 2 – How to use

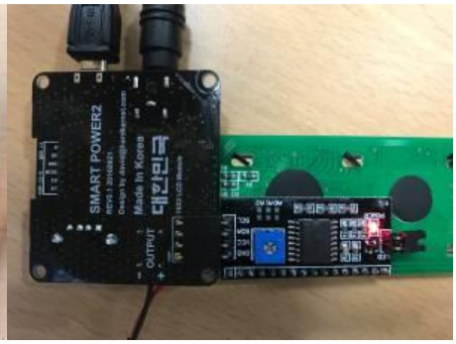




Connect the included 15V/4A adapter and plug the output cable into the terminal block.
Ensure the DC plug cable is properly connected to the negative(black) and positive**(red).**
Caution! if you plug it the other way, your board will be seriously damaged.

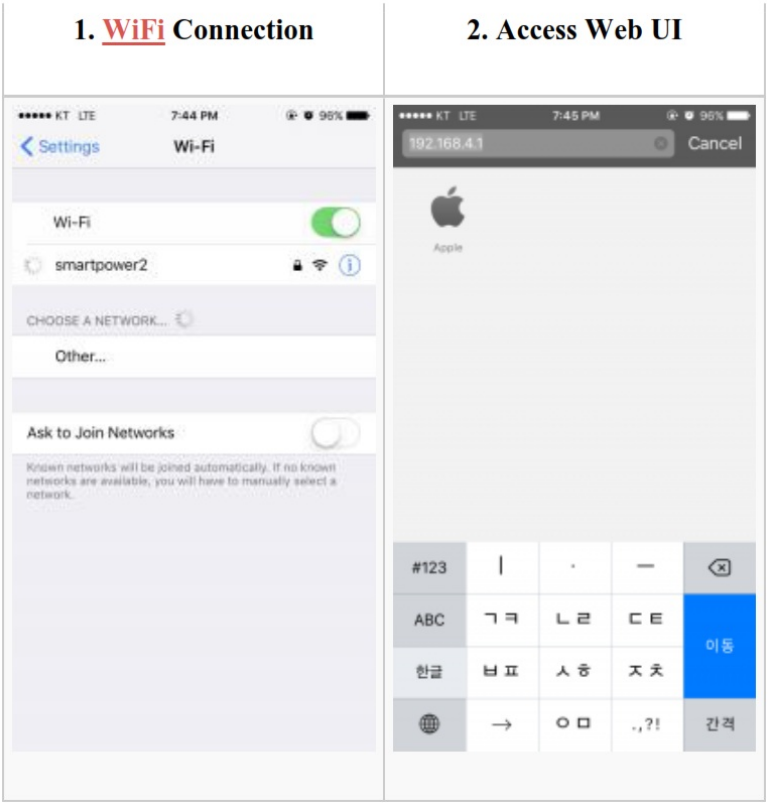
Without WiFi (Standalone mode)

1. **Output Power ON/OFF**
   You can turn the output power on/off using the tact switch on SmartPower2
2. **Power monitoring with 16×2 LCD**
   We recommend connecting the LCD after disconnecting the main power source.



With WiFi (Connected mode)
The webpage supports IE 11+, Edge 13+, Firefox 47+, Chrome 49+, Safari 9.1+, Opera 41+, IOS Safari 9.3+, Android Browser 4.4+, Chrome for Android 53+

1. WiFi Connection
   Default SSID: smartpower2, Password: 12345678
2. Access Web UI



   Default web server IP: 192.168.4.1
3. Home
   • Seven Segments: voltage, ampere, watt, watt-hour.
   • ON/OFF slide: Output power ON/OFF.
   • Start/Stop slide: Watt-hour measurement Start/Stop.
   • Voltage slider: Change output voltage.
   • Save Default Voltage button: Set default voltage.
4. Settings
   • AutoRun checkbox – Output power ON/OFF automatically when you power on the SmartPower2.
   • Save Button – Save Network Configuration (SSID, IP Address, Password).

3. Home	4. Settings
	

• Reset Button – Initialize User Network Configuration (Factory reset)

With Telnet (Connected mode)
After connection with **WiFi,** you can get power data via telnet.
[Voltage],[Ampere],[Power],[Watt hour]
$ telnet 192.168.4.1
5.255,0.451,2.374,0.000
5.256,0.451,2.374,0.000

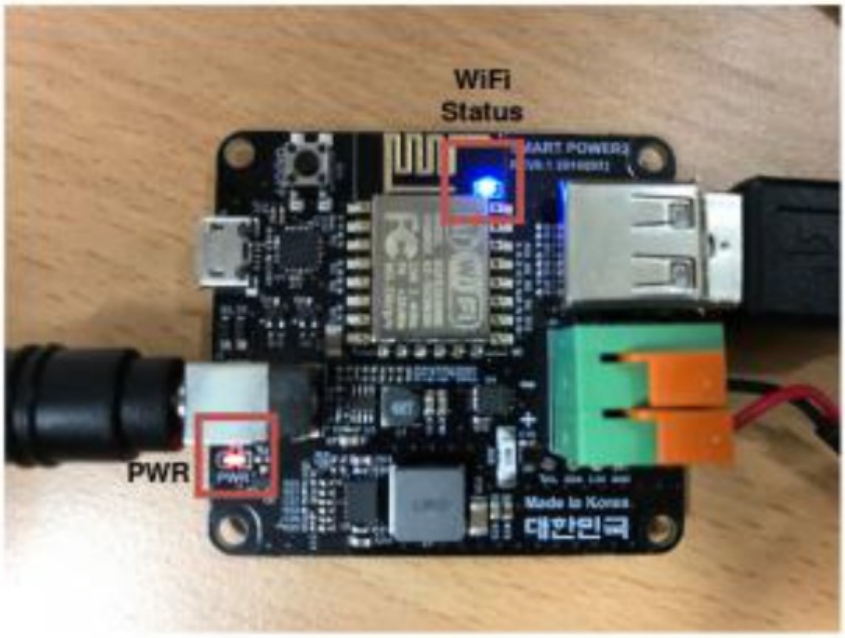
Receiving Power Data via micro USB cable

This feature is available in F/W v1.4 or later.
You can receive power data(current, voltage, power, watt-hour) from your SmartPower2 to your PC or ODROIDs through serial.
The serial output is available only when the output power is enabled.
Requirement Parameters
• 115200bps 8N1
• no-flow-control

1. Connect your SmartPower2 to your PC via micro USB cable
2. Run Serial serial console programs like putty or minicom
3. Enable power-on

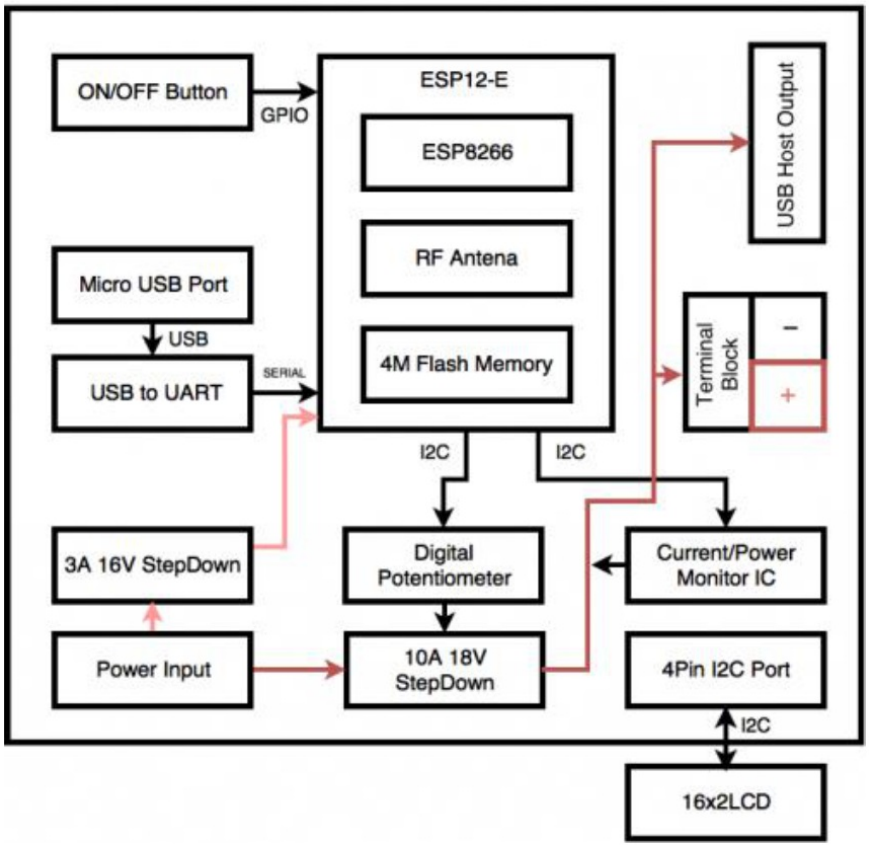
LED State

LED	State	Description
	off	Input power off
PWR(D1)	on	Input power on
	blink	Output power on
	off	no WiFi connection
WiFi Status	on	WiFi connected
	blink	Webpage loaded



System Reset
After boot, press the ON/OFF switch for 5 seconds to reset all settings including WiFi.

Hardware



Documentation

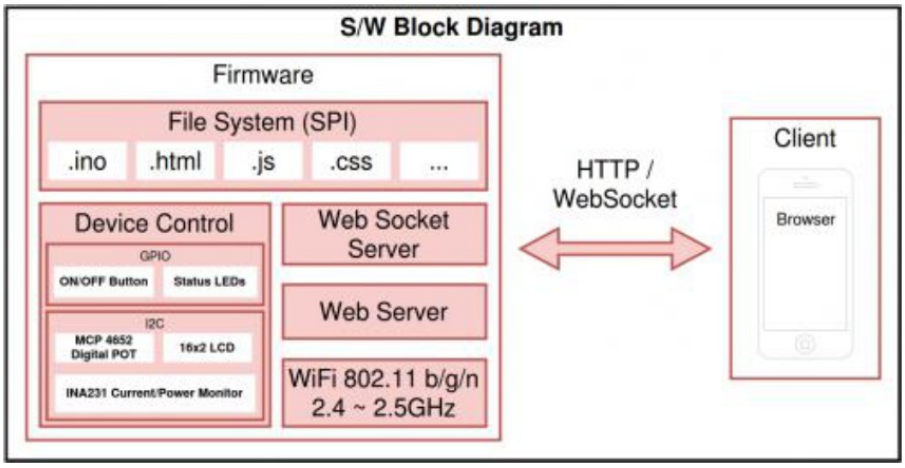
Schematic

- **SmartPower2**

Data Sheet

- MCU – **ESP8266 Espressif** low power 32-bit MCU
- USB to UART – **CP2104** single-chip USB-to-UART bridge
- 3A 16V Stepdown – **MP1495S** High-Efficiency 3A, 16V, 500kHz Synchronous Step Down Converter
- Digital Potential Meter – **MCP4652** 7/8-Bit Single/Dual I2C Digital POT with Volatile Memory
- Current/Power Monitor – **ina231** High- or Low-Side Measurement, Bidirectional CURRENT/POWER MONITOR with 1.8-V I2C Interface
- 10A 18V Stepdown – **MP8762** High Efficiency, 10A, 18V Synchronous Step-down converter

Software



Framework – Arduino, Jquery
Build Platform – **Platform, Arduino IDE**

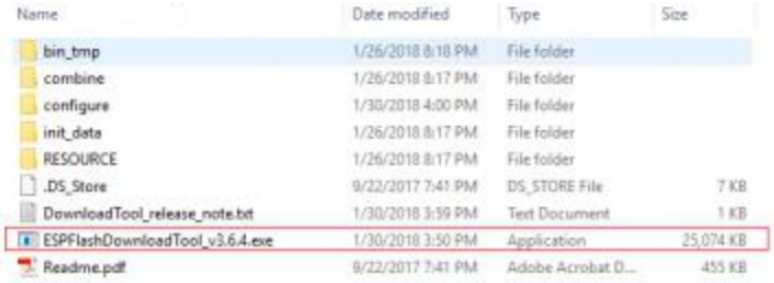
Upload the Firmware
Simple instruction for Firmware upload.
Linux

1. Install the requirements
   $ Sudo apt install python-pip git
   $ Sudo pip install esptool
2. Get the binaries about firmware and web source
   $ git clone **https://github.com/hardkernel/smartpower2.git**
   $ cd smartpower2
3. **Upload**
   You should check your esp8266 serial number like "/dev/ttyUSB0" or "/dev/ttyUSB1"
   $ sudo esptool.py –chip esp8266 –port /dev/ttyUSB0 –baud 921600 write_flash 0x00000 prebuilt/firmware.bin 0x100000 prebuilt/spiffs.bin

Windows

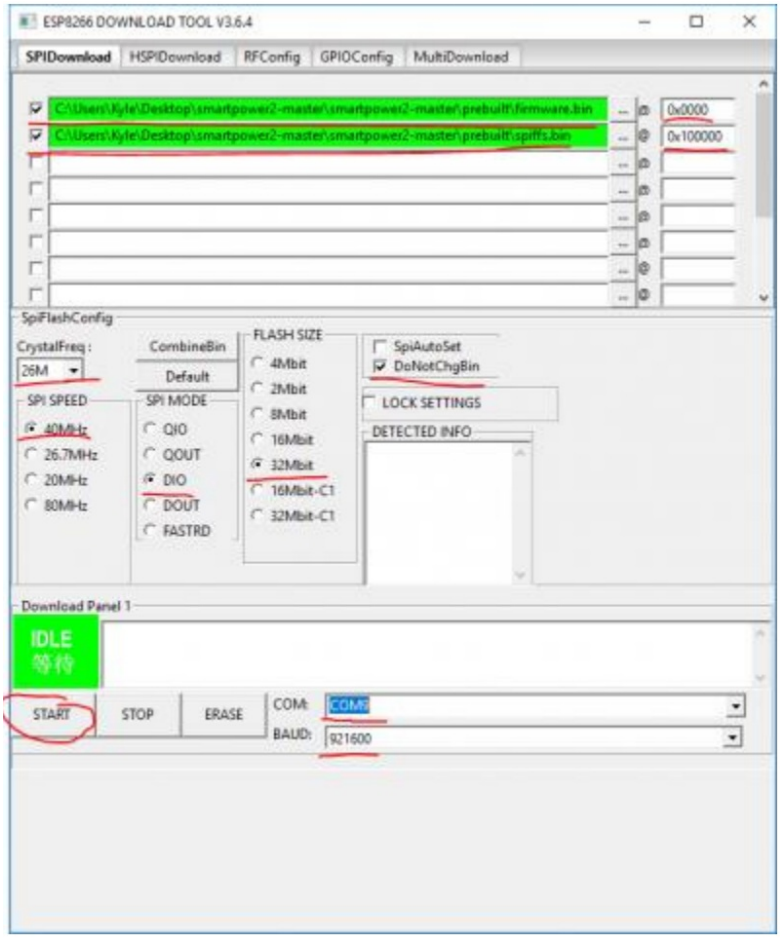
The instructions were tested on Windows 10.

1. Get the binaries about firmware and web source from this link **https://github.com/hardkernel/smartpower2/releases** then, you need to extract the zip file from your work folder.
2. Download and extract the flash tool **flash_download_tools_v3.6.6_0.zip**



3. Run the exe file into the folder

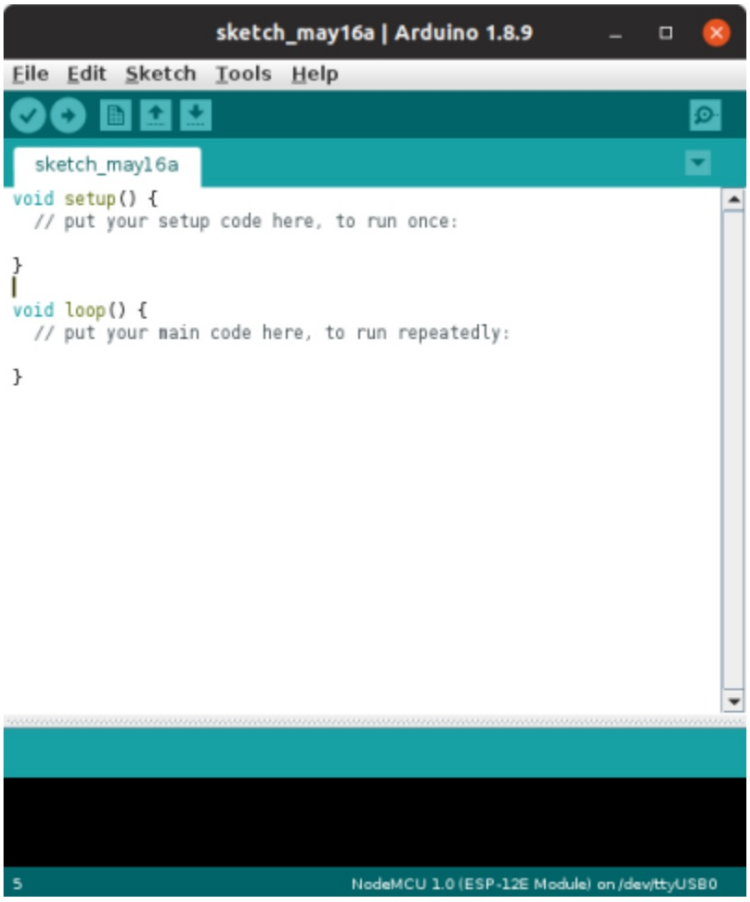
4. Select ESP8266
5. Start upload
   You have to input binaries and other parameters as shown below picture. **COM port is variable depending on your PC environment** .



Build Firmware

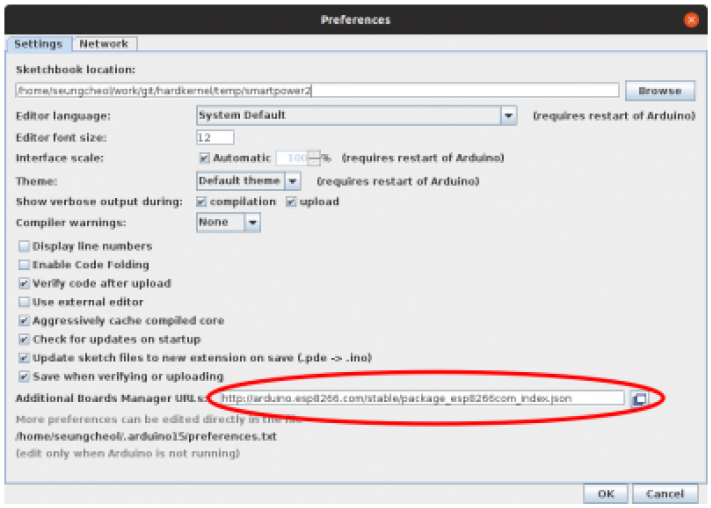
This guide is working with x86 platforms only. The development tools are not available for ARM platforms.
You can use Arduino IDE or PlatformIO to build the platform.
Arduino IDE

1. Install Arduino IDE for ESP8266
   Download the Arduino IDE via this link
   https://www.arduino.cc/en/Main/Software



Run Arduino IDE and open “File → Preferences” on the menu bar Add

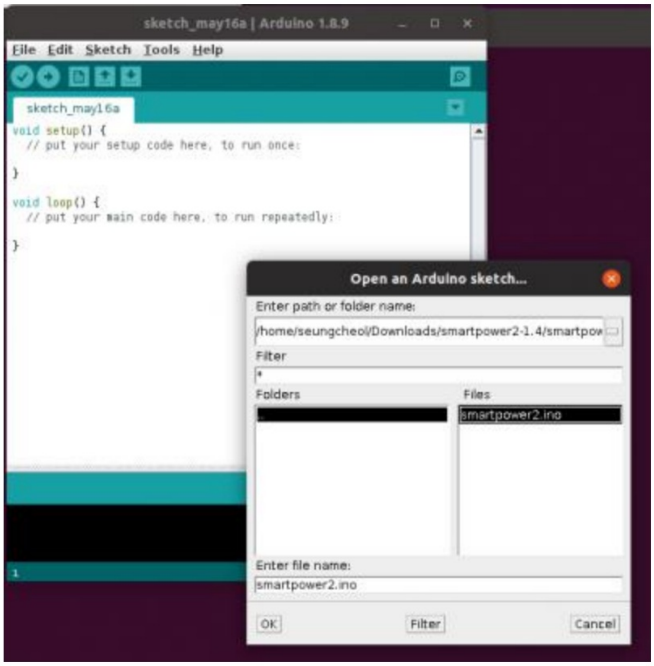
https://arduino.esp8266.com/stable/package_esp8266com_index.json into “Additional Boards Manager URLs”

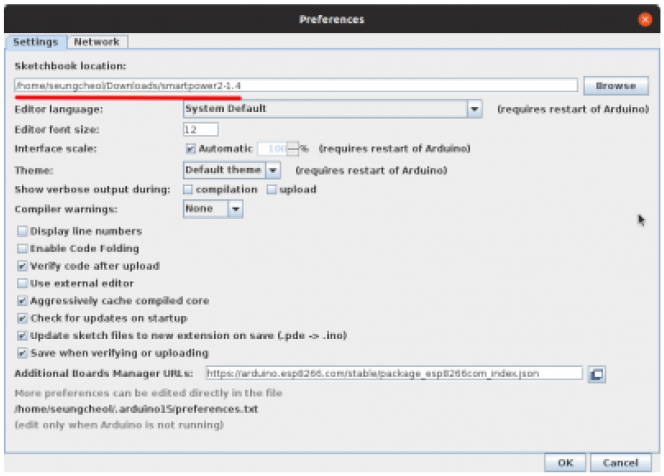


After adding the URL, you are able to search “esp8266” in “Tools → Board → Boards Manager”.
Install the esp8266 Android version 2.4.2!
Currently, Smartpower2 is not compatible with version esp8266 Android v2.5.0 or higher.

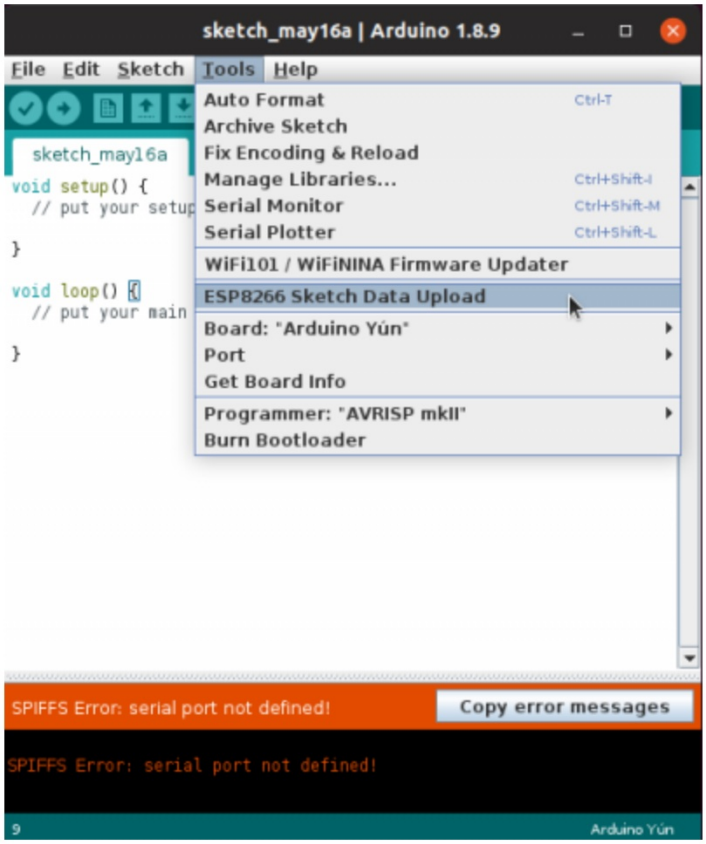
Select “Tools → board” to “**NodeMCU** 1.0(ESP-12E Module)”

2. Get source code
   Download the latest source code.
   v1.6-arduino.zip

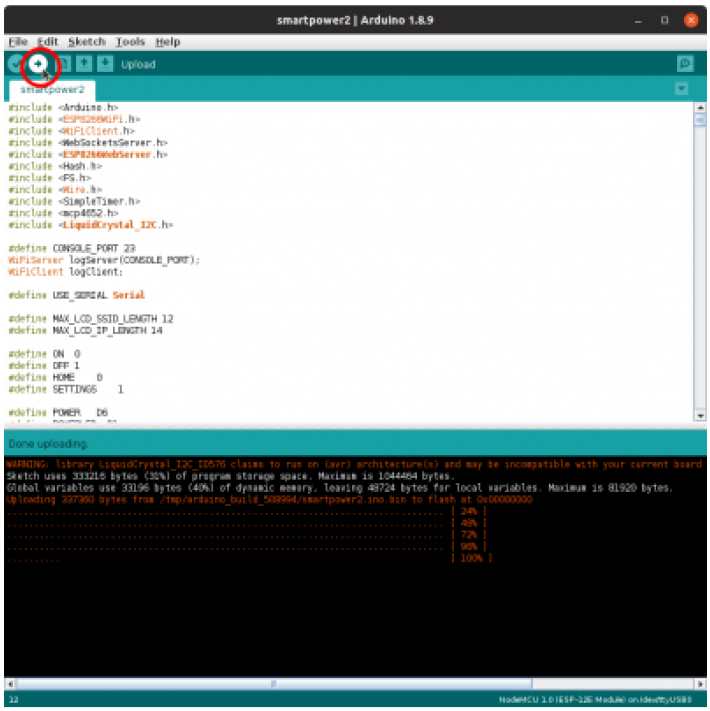
Unpack and open the “smartpower2.ino” in Arduino 

Configure your Sketchbook location to your project root folder. (In my case $HOME/Downloads/smartpower2-1.4) 

Restart Arduino IDE. Then, you can see “ESP8266 Sketch Data Upload” on the tools menu bar.

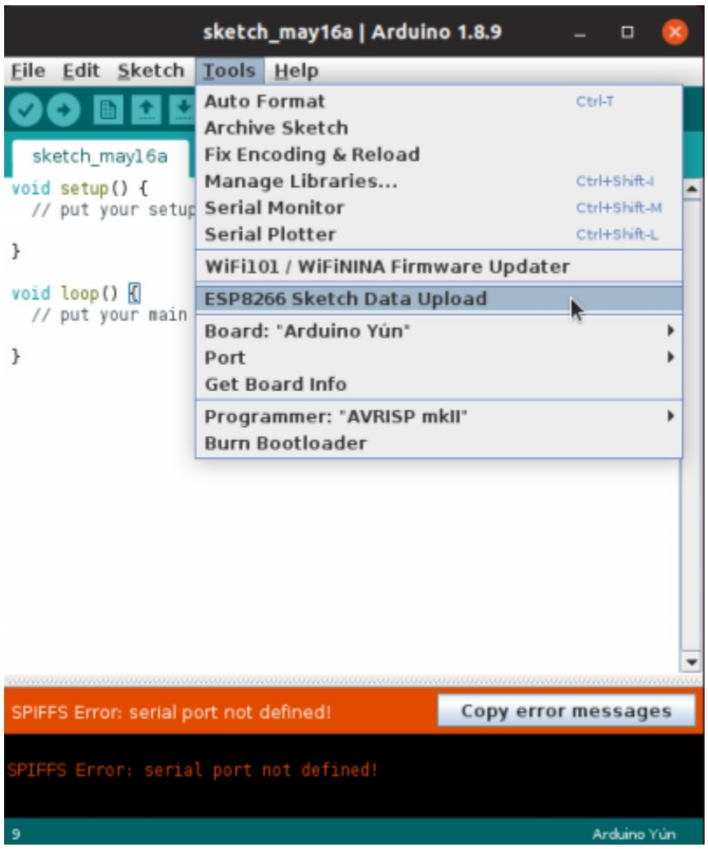


3. Compile and upload



Run upload!

Run “ESP8266 Sketch Data Upload” on the tools menu bar.



PlatformIO

Linux

1. Install PlatformIO
   sudo apt-get install python-pip
   sudo pip install -U platformio
   platformio –version
   If you have any issues while installing it, refer to this guide.
   http://docs.platformio.org/en/stable/installation.html
2. Get source code
   Sudo apt-get install git
   git clone h**ttps://github.com/hardkernel/smartpower2.git -b v1.6**-platformio
3. Build & Upload Connect MicroUSB to Host PC.
   You can see the list of USB drivers “CP210x UART Bridge” by lsusb in the terminal.
   cd smartpower2
   sudo platformio run
   Sudo platformio run –target upload
   sudo platformio run –target uploads

Windows

1. Install platformIO
   http://docs.platformio.org/en/stable/installation.html
2. Get source code
   v1.6-platformio.zip
3. Build & Upload
   Run CMD and move to the smartpower2 folder and Connect MicroUSB to Host PC.
   You can see the list of USB drivers “CP210x USB to UART Bridge(COMx)” on the Device Manager.
   cd /path/to/dir/smartpower2
   platformio run
   platformio run –target upload
   platformio run –target uploads

Troubleshooting

“undefined reference to sqrt” error
If you have any errors such as the following.
/home/kyle/.platformio/packages/toolchain-xtensa/bin/../lib/gcc/xtensa-lx106-elf/4.8. 2/../../../../xtensa-lx106-elf/lib/libm.a(lib_a-w_sqrt.o):(.literal+0x8): undefined r eference to `__ieee754_sqrt’=
/home/kyle/.platformio/packages/toolchain-xtensa/bin/../lib/gcc/xtensa-lx106-elf/4.8. 2/../../../../xtensa-lx106-elf/lib/libm.a(lib_a-w_sqrt.o): In function `sqrt’:
/xtensa/esp-open-sdk/crosstool-NG/.build/src/newlib-2.0.0/newlib/libm/math/w_sqrt.c:6 9: undefined reference to `__ieee754_sqrt’
collect2: error: ld returned 1 exit status
*** [.pioenvs/esp12e/firmware.elf] Error 1
Please try to replace the **libm.a** file in the “.platformio/packages/toolchain-xtensa/xtensa-lx106elf/lib/” after extract.
Refer to: **https://github.com/esp8266/Arduino/issues/612**

F/W Version History

Release Date	Version	Description	Git
Oct 11 2019	**v1.6**	Fix the “ISR, not in IRAM” error	**https://github.com/hardkernel/smartpower2/tree/v1.6-arduino**
May 17 2019	**v1.5**	Add Arduino branch	**https://github.com/hardkernel/smartpower2/tree/v1.5-arduino**
May 28 2018	**v1.4**	Add receiving power data function through serial	**https://github.com/hardkemel/smartpower2/tree/v1.4**
February 12 2018	v1.3	Fix compile errors	
March 27 2017	v1.2	Fix the LCD display of watt-hours, display volts, and amps to three decimal places on the web interface.	
January 22 2017	**v1.1**	Add console logging with telnet and make SSID unique to each device	**https://github.com/hardkernel/smartpower2/tree/v1.1**

F/W upload tutorials
Release Note of F/W v1.6

- Fix the “ISR, not in IRAM” error: **https://github.com/hardkernel/smartpower2/commit/03741a6fb96f5e2b64f3f342e8ed324136e78ea3**

Release Note of F/W v1.5

- Add the Arduino branch
- Fix build flags on the platform: **https://github.com/hardkernel/smartpower2/commit/998e002d1c4520b54701307dd60f841c9bf58f63**

Release Note of F/W v1.4

- You can receive power data(current, voltage, power, watt-hour) from your SmartPower2 through serial
- **How to use this**

Release Note of F/W v1.1
Thanks to **https://github.com/OtherCrashOverride**
New features

- console logging with telnet
- Assign a Unique SSID on each device for using multiple SmartPower2s simultaneously.

Documents / Resources

ODROID ESP12E Smart Power 2 with 15V 4A Adapter [pdf] Instruction Manual
ESP12E Smart Power 2 with 15V 4A Adapter, ESP12E, Smart Power 2 with 15V 4A Adapter

References

- Redirecting...
- arduino.esp8266.com/stable/package_esp8266com_index.json
- files.gitter.im/esp8266/Arduino/Abqa/libm.a.tbz
- Stable version libm.a compilation error · Issue #612 · esp8266/Arduino · GitHub
- GitHub - hardkernel/smartpower2
- fix the error "ISR not in IRAM" · hardkernel/smartpower2@03741a6 · GitHub
- fix the error "ISR not in IRAM" · hardkernel/smartpower2@03741a6 · GitHub
- update to v1.5 · hardkernel/smartpower2@998e002 · GitHub
- update to v1.5 · hardkernel/smartpower2@998e002 · GitHub
- Releases · hardkernel/smartpower2 · GitHub
- GitHub - hardkernel/smartpower2 at v1.1
- GitHub - hardkernel/smartpower2 at v1.4
- GitHub - hardkernel/smartpower2 at v1.5-arduino
- GitHub - hardkernel/smartpower2 at v1.6-arduino
- OtherCrashOverride · GitHub
- accessory:power_supply_battery:arduino_board_manager_url.png [ODROID Wiki]
- accessory:power_supply_battery:arduino_board_nodemcu.png [ODROID Wiki]
- accessory:power_supply_battery:arduino_ide.png [ODROID Wiki]
- accessory:power_supply_battery:arduino_open_project.png [ODROID Wiki]
- accessory:power_supply_battery:arduino_sketchbook_location.png [ODROID Wiki]
- accessory:power_supply_battery:arduino_upload.png [ODROID Wiki]
- accessory:power_supply_battery:arduino_uploadfs.png [ODROID Wiki]
- accessory:power_supply_battery:board_manater_esp8266.png [ODROID Wiki]
- accessory:power_supply_battery:ipsetting.png [ODROID Wiki]
- en:acc:sp2:block.png [ODROID Wiki]
- en:acc:sp2:board_onoff.png [ODROID Wiki]
- en:acc:sp2:board.jpg [ODROID Wiki]
- en:acc:sp2:home.png [ODROID Wiki]
- en:acc:sp2:hwblock.png [ODROID Wiki]
- en:acc:sp2:ip.png [ODROID Wiki]
- en:acc:sp2:lcd_bottom.jpg [ODROID Wiki]
- en:acc:sp2:lcd_top.jpg [ODROID Wiki]
- en:acc:sp2:led.png [ODROID Wiki]
- en:acc:sp2:run.png [ODROID Wiki]
- en:acc:sp2:select_esp8266.png [ODROID Wiki]