GETTING STARTED

Onion Omega2S Development Kit
Getting Started Guide

Version 1.0

Omega2 IoT Computer

Revision History

Revision	Date	Description
1.0	March 17, 2018	Initial release

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The Omega2S Development Kit consists of the Omega2S, Onion's surface-mount Linux WiFi module, and the Development Board, meant to showcase the functionality of the Omega2S module and serve as a test-bed for initial product development.

The Omega2S is a highly integrated WiFi enabled, Linux module designed by Onion Corporation. It utilizes the Mediatek MT7688AN System on a Chip (SoC) which is based on the MIPs 24K CPU processor core. The SoC includes 802.11b/g/n Wi-Fi, making the Omega2S ideal for Internet of Things (IoT) applications and projects. In addition to the SoC, the module includes DDR2 DRAM, Flash memory, and all of the components necessary to allow this product to be a fully functional and complete device.

The Omega2S Development Board has an easy insertion socket for the Omega2S Module, and exposes all of the available Omega2S hardware I/O: including the USB Port, Ethernet Port, Dual Reset Functions, and Connectors Pins for all other I/O.

There are two versions available:

- Omega2S Development Kit - SD: SD Card Slot Version
- Omega2S Development Kit - eMMC: 8GB eMMC Memory Version

For easy development, the Development Board can be powered via the Micro-USB port. The Micro-USB port also allows for easy access to the Omega's command line, thanks to the on-board USB-to-Serial chip. Finally, the PCB trace WiFi antenna allows the Omega2S to connect to WiFi networks without the need for an external uFL antenna.

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The Omega2S Development Kit consists of the Omega2S and the Development Board.

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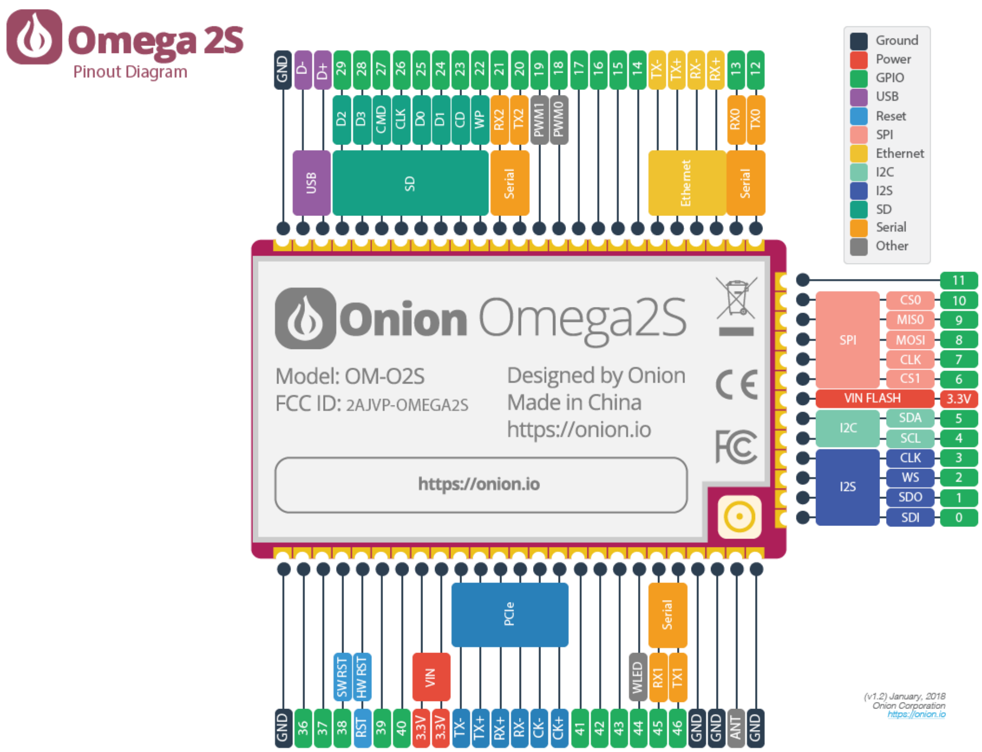
The Omega2S Module is a Surface Mount version of Onion Omega2 board, designed specifically for high volume commercial and industrial applications. It’s low profile (only 2.8mm high) and gives you high flexibility and availability of designing your custom products with the power of Omega2S. It has 42 additional I/O pins, and a uFL connector for an external antennas.

It is available in two memory size versions, similar to the Omega2:

- Omega2S: 64 MB DRAM, 16 MB Flash
- Omega2S+: 128 MB DRAM, 32 MB Flash

Pinout Diagram:



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Other than the obvious form-factor differences from the through-hole Omega2, the Omega2S also features the following:

- Exposes more IOs: 43 General Purpose I/Os (as opposed to the 21 available on the through-hole version)
- The additional exposed I/Os include:
  - All I/Os required for using an SD card slot or eMMC memory
  - Using 4 additional Ethernet ports - for a total of 5 ports
  - Access to UART2
  - Access to SPI CS0
- Does not feature a built-in SMT WiFi antenna - optimizing area and allowing the end-user the freedom to select between using the ANT I/O or the uFL connector

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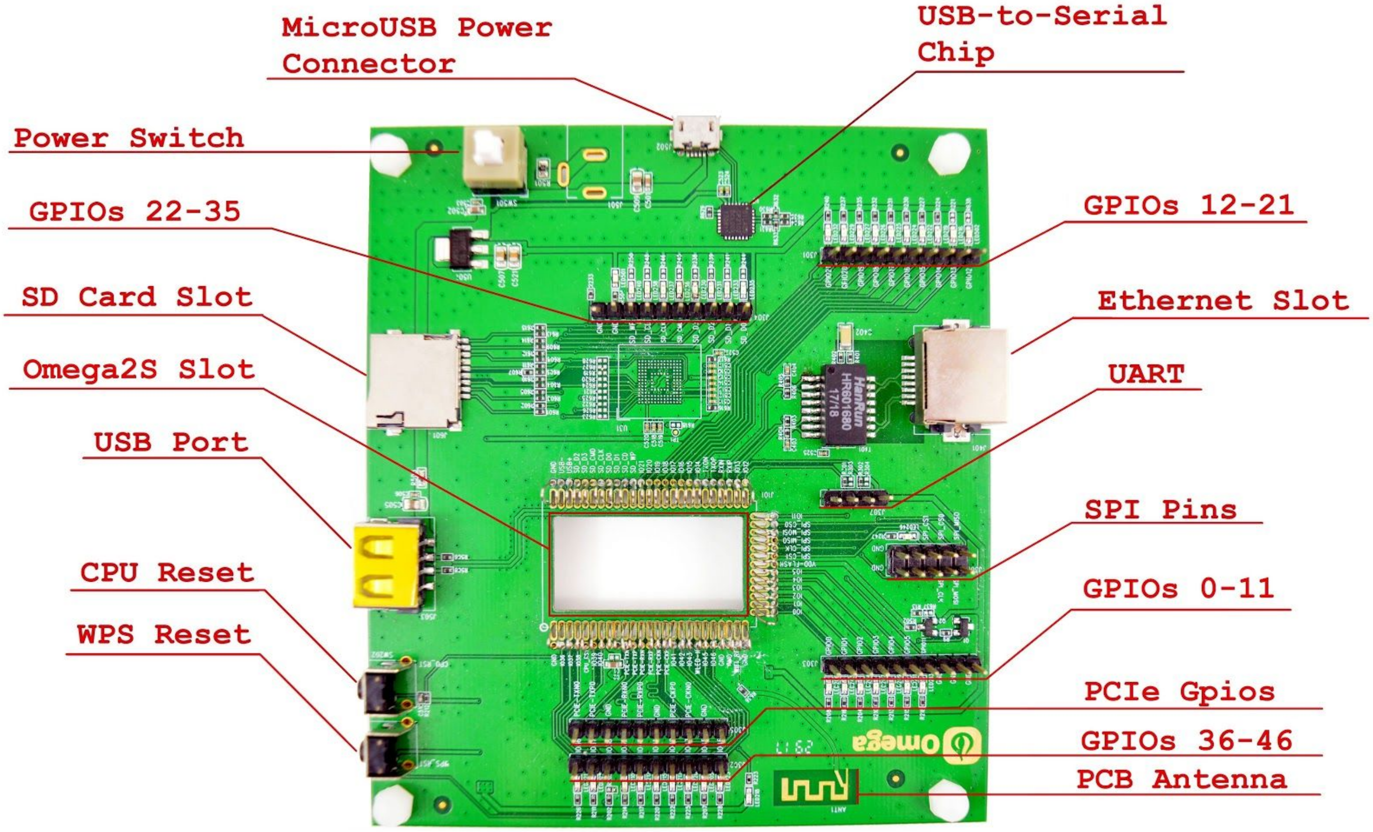
This version features an SD card slot.



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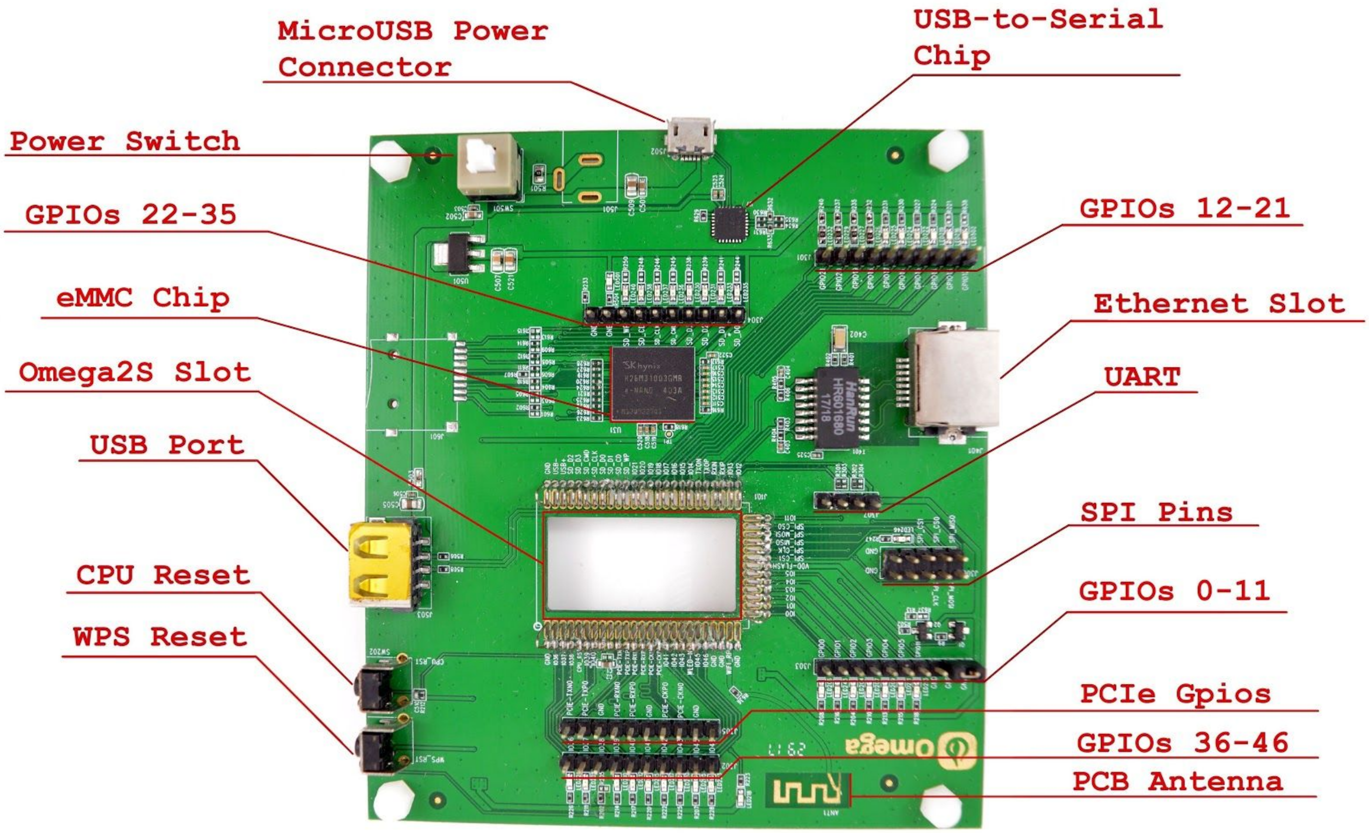
This version features an on-board 8GB eMMC storage module. It does not feature an SD card slot as they are mutually exclusive.



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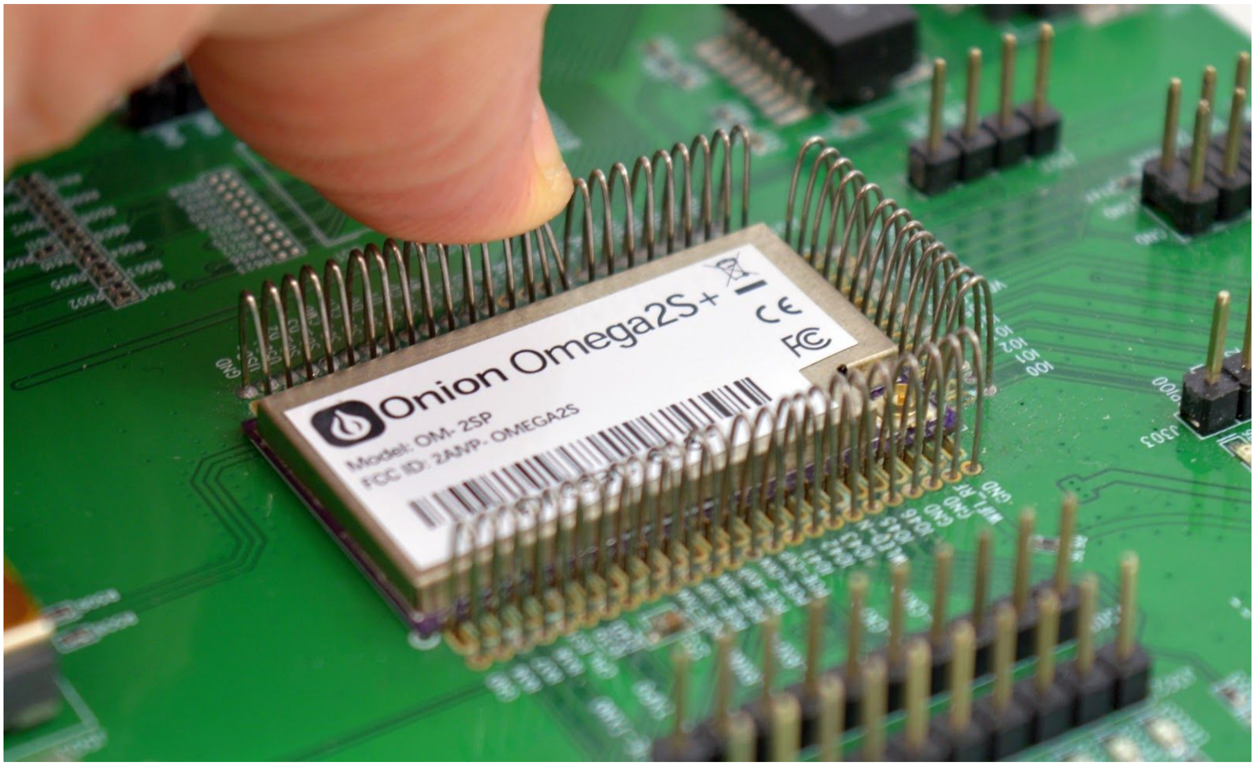
Follow this guide in order to connect the Omega2S to the Development Board properly and power it up. We'll outline the suggested steps to perform the physical connection and power up the device.

See our visual guide for more details: https://youtu.be/aoYadArVJPw

Steps:

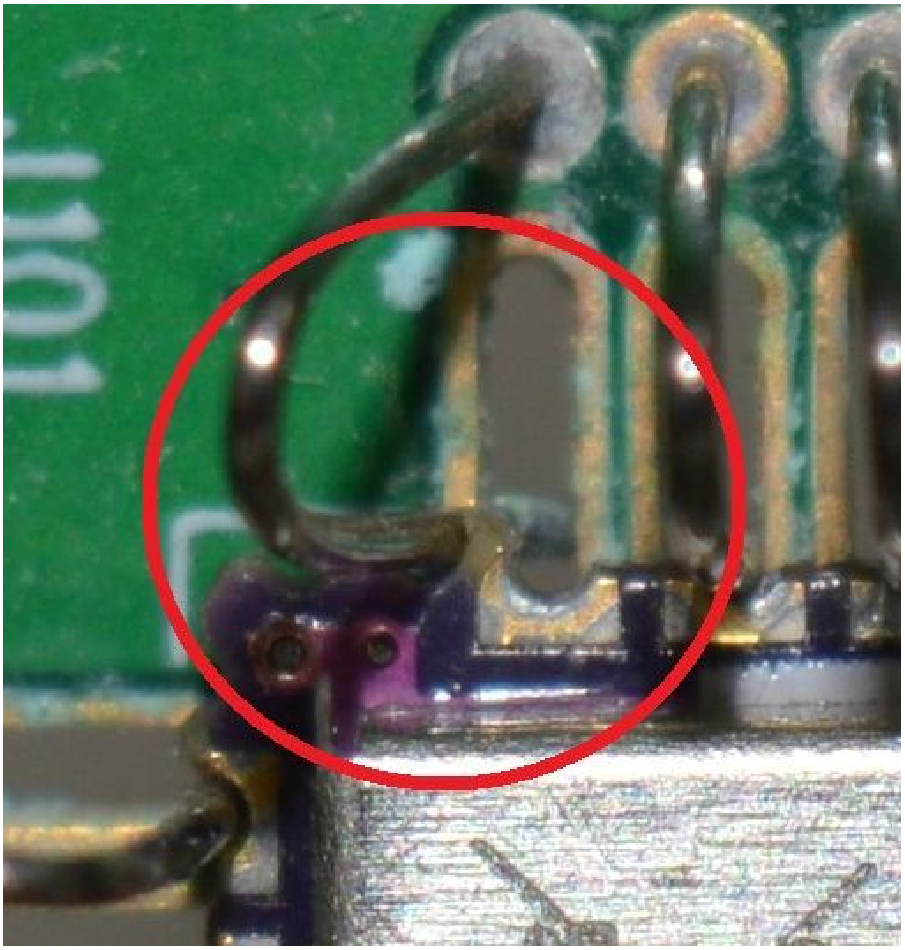
- Insert Omega2S into the socket
  - Omega2S has 3 sides with pins, make sure to match the sides with pins to the rail-pins on the Dev Board socket
  - Make sure your Omega is plugged and pressed down to complete the connection

- Socket pin combing
    - Ensure the connection between the Omega2S and socket by using your thumb to comb the rail-pins of the Omega2S socket on the Development Board to avoid disconnected pins and undefined behavior (Please see the picture below)



    - Refer to our visual guide for more clarity on the combing procedure: https://youtu.be/aoYadArVJPw

- Always check that each rail-pin is connected to its corresponding Omega castellated socket before powering the device. ***The image below represents the incorrect positioning of the rail-pin:***



- Power up and turn on the Omega
    - Connect a Micro-USB cable to the Dev Board and turn on the power switch ON by pressing the white button down till it clicks
    - For best results, use a high-quality cable that is at most 2m (6ft) long
- Omega LED indicates booting
    - LED218 Blinks on Boot. Once booted, it will become solid, meaning that the Omega has completed its boot sequence.
    - LED243 Stays solid at all times when powered up


Onion Omega2S+
Model: OM- 2SP
FCC ID: 2AJVP- OMEGA2S
40A36BC16D3F
LED218
LED243

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When Omega2S has completed the boot sequence, LED218 will stop blinking and remain solid. This takes approximately 1 minute.

Since the Dev Board has a USB-to-Serial chip on-board, use USB connection to connect to the serial terminal.

- Please follow our guide on [how to connect to the Omega via Serial]()
- Once a connection to the Omega is established, the Omega can be connected to a nearby WiFi network
  - Please follow the steps on [how to setup the Omega through the Command Line]()

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Most Omega2 documentation applies to the Omega2S Development Kit as well:
https://docs.onion.io/omega2-docs

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- To control the GPIO's of the Omega2S, follow the [guide on using the Omega's GPIOs]()
- Each available GPIO has its own LED that serves as a status indicator.
  - Please note, the LED's are active LOW, so in order to activate them, pass logic 0 to the connected GPIO.

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- The Dev Board has a USB Port that exposes the Omega's USB2.0 host port. This port can be used for USB storage devices, USB cameras, etc.