



## A20-OLinuXino-LIME

File:A20-OLinuXino-LIME.jpeg

A20-OLinuXino-LIME looks identical to A10-OLinuXino-LIME, except for the more powerful A20 processor. The A10 and the A20 processors are pin-to-pin compatible. Because of the processor, software-wise the board is closer to A20-OLinuXino-MICRO than to the A10-OLinuXino-LIME. This resemblance to other designs definitely might speed the development on the board - a lot of software written for A20-OLinuXino-MICRO might work out-of-the-box with A20-OLinuXino-LIME. Additionally, pinout tables, GPIO maps, etc released for A10-OLinuXino-LIME would apply to A20-OLinuXino-LIME

A20-OLinuXino-LIME features:

- A20 Cortex-A7 dual-core ARM Cortex-A7 CPU and dual-core Mali 400 GPU
- 512MB DDR3 RAM memory
- optional 4GB NAND FLASH memory
- SATA connector with 5V SATA power jack
- HDMI FullHD 1080p
- 2x USB Low-Full-High-Speed hosts with power control and current limiter
- USB-OTG with power control and current limiter
- 100MBit native Ethernet
- LiPo Battery connector with battery-charging capabilities
- LCD connector compatible with with 4.3", 7.0", 10.1" LCD modules from Olimex
- 160 GPIOs on three GPIO connectors
- MicroSD card connector
- DEBUG-UART connector for console debug with USB-SERIAL-CABLE-F
- status LED
- Battery charge status LED
- Power LED
- 2KB EEPROM for MAC address storage and more
- 2 BUTTONS with ANDROID functionality + RESET button
- 2 mount holes
- 5V input power supply, noise immune design
- PCB dimensions: 84 x 60 mm

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## Official Images from OLIMEX

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The file for download xxxx.7z is an archive of xxx.img file. So in order to write the image on SD card you have to unzip xxx.7z file and:

→ For Windows:

Use 7zip and then use Win32DiskImager.exe (<http://sourceforge.net/projects/win32diskimager/>) for image writing

→ For Linux

Use p7zip package. If you have no installed 7zip then type

```
#apt-get install p7zip
```

Copy a10\_Lime\_debian\_second\_release.7z file in your directory and unzip it with

```
#7za e a10_Lime_debian_second_release.7z
```

The output should be a new 4GB file named a10\_Lime\_debian\_second\_release.img Put 4GB SD card in your card reader and type

```
# ls /dev/sd
```

Then press two times <TAB> you will see a list of your sd devices like sda sdb sdc note that some of these devices may be your hard disk so make sure you know which one is your sd card before you proceed as you can damage your HDD if you choose the wrong sd-device. You can do this by unplugging your sd card reader and identify which "sd" devices remove from the list. Once you know which device is your sdcard like sda use this text instead of the sdX name in the references below:

```
#dd if=a10_Lime_debian_second_release.img of=/dev/sdX
```

## Linux

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To be uploaded.

Note: the A10-Debian card which we have in our web store contains the same image on 4GB Class10 fast micro SDcard, if you want to use this image please use card of Class10 speed or the performance of Linux will be very slow.

Note: in the previous Debian releases the Ethernet was auto-detected and initialized during boot BUT this was causing big delays in the start-up of the board if you didn't want to use Ethernet or if there wasn't Ethernet cable connected.

You can enable it by following these two steps:

1. To check under what name the LAN is associated write "ifconfig -a"

2. If, for example, it is under eth0 name, then write: "dhclient eth0"

This should enable the Ethernet and then SSH would also be available.

## Android

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To be uploaded

## Documents

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### A10-OLinuXino-LIME user's manual

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User's manual for A10-OLinuXino-LIME and A10-OLinuXino-LIME-4GB ([https://www.olimex.com/Products/OLinuXino/A10/A10-OLinuXino-LIME/resources/A10-OLinuXino-LIME\\_manual.pdf](https://www.olimex.com/Products/OLinuXino/A10/A10-OLinuXino-LIME/resources/A10-OLinuXino-LIME_manual.pdf))

### A20 Brief

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A20 brief (<https://github.com/OLIMEX/OLINUXINO/blob/master/HARDWARE/A20-PDFs/A20%20brief%2020130407.pdf>)

### A20 Datasheet

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A20 Datasheet (<https://github.com/OLIMEX/OLINUXINO/blob/master/HARDWARE/A20-PDFs/A20%20Datasheet%20v1.0%2020130227.pdf>)

### A20 User Manual

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A20 user's manual (<https://github.com/OLIMEX/OLINUXINO/blob/master/HARDWARE/A20-PDFs/A20%20User%20Manual%202013-03-22.pdf>)

## Hardware

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### LIME shields

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Eagle and KiCAD shield templates for LIME (<https://github.com/OLIMEX/OLINUXINO/tree/master/HARDWARE/A10-OLinuXino-LIME>)

### GPIO description

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A10-OLinuXino-LIME GPIO description ([https://github.com/OLIMEX/OLINUXINO/blob/master/HARDWARE/A10-OLinuXino-LIME/A10\\_Lime\\_GPIOs.pdf](https://github.com/OLIMEX/OLINUXINO/blob/master/HARDWARE/A10-OLinuXino-LIME/A10_Lime_GPIOs.pdf))

A template that might be used to create custom shields or own adapters might be downloaded for Eagle or KiCad at the GitHub here: [shield template \(https://github.com/OLIMEX/OLINUXINO/tree/master/HARDWARE/A10-OLinuXino-LIME\)](https://github.com/OLIMEX/OLINUXINO/tree/master/HARDWARE/A10-OLinuXino-LIME)

### Power supply and consumption

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A10-OLinuXino-LIME requires 5V regulated power supply external source. regulated means that the power supply adapter should provide exactly 5V no matter loaded or unloaded (some cheap wallwart adapters are not regulated and under no load their power supply may be higher than 5V although marked as 5V power supply, please measure with voltmeter if your power supply provide 5V as if you connect more than 5V to LIME it will be damaged!!!)

The power jack is standard OLIMEX Power jack (<https://www.olimex.com/wiki/PWRJACK>).

A10-OLinuXino-LIME can be powered from three sources:

- +5VDC voltage applied PWR jack
- +3.7V from LiPo re-chargable battery connected to LiPo board connector
- +5V applied to USB-OTG connector

Power consumption is as follows:

- LiPo 3.7V power battery: 1.2W
- +5VDC input power: 1.3W

Comparison table of power consumption might be found at the following link (<https://www.olimex.com/Products/OLinuXino/resources/OLinuXino-Consumption.pdf>).

LiPo battery allow backup power supply when main power is interrupted. A10-OLinuXino-LIME have power management IC which charge the battery when main power is present, when power is interrupted the LiPo battery automatically provide backup power supply. Step-up converter provide 5V for the USB peripherals too. For LiPo batteries we recommend these:

- 1400mAh (<https://www.olimex.com/Products/Power/BATTERY-LIPO1400mAh/>)
- 3000mAh (<https://www.olimex.com/Products/Power/BATTERY-LIPO3000mAh/>)
- 4400mAh (<https://www.olimex.com/Products/Power/BATTERY-LIPO4400mAh/>)
- 6600mAh (<https://www.olimex.com/Products/Power/BATTERY-LIPO6600mAh/>)

## Board dimensions

A20-OLinuXino-LIME basic dimensions in mils: 3305.5 x 2347.0

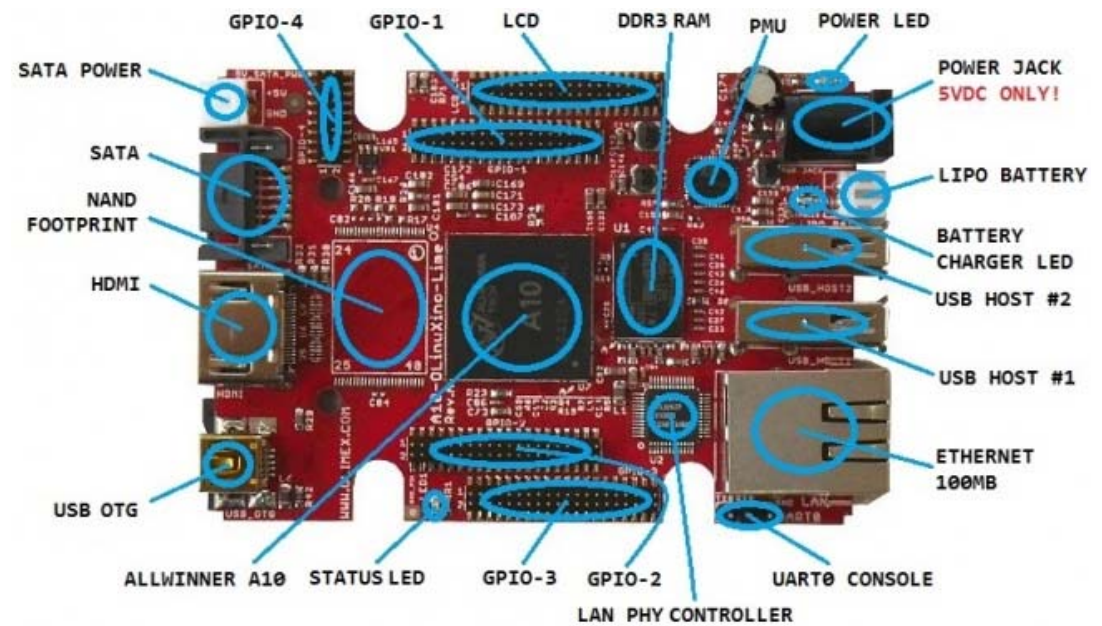
Some additional measures might be seen in the image here: [link \(https://www.olimex.com/Products/OLinuXino/A10/A10-OLinuXino-LIME/resources/A10-LIME-dimensions.png\)](https://www.olimex.com/Products/OLinuXino/A10/A10-OLinuXino-LIME/resources/A10-LIME-dimensions.png)

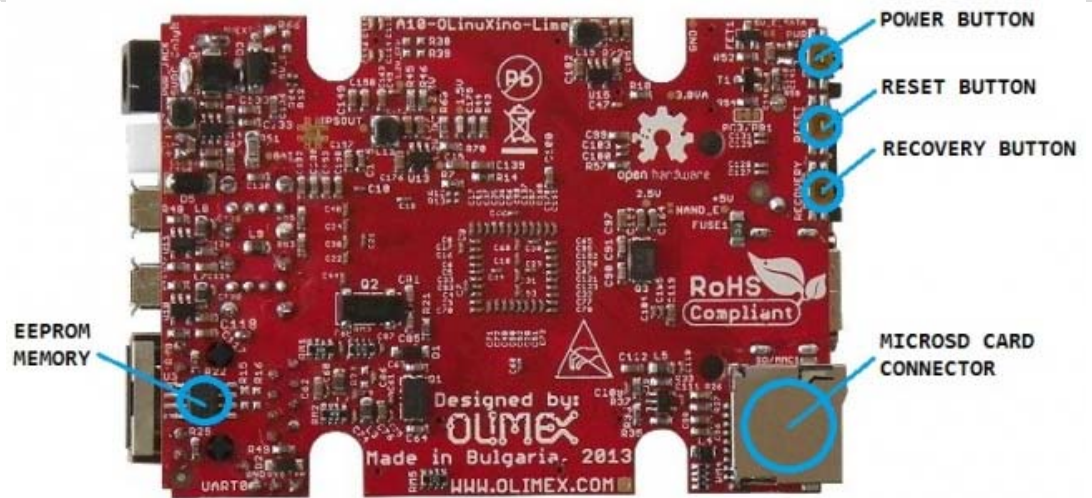
## CAD files

A10-OLinuXino-LIME is Open Source Hardware, CAD files are available at [GitHub \(https://github.com/OLIMEX/OLINUXINO/tree/master/HARDWARE/A10-OLinuXino-LIME\)](https://github.com/OLIMEX/OLINUXINO/tree/master/HARDWARE/A10-OLinuXino-LIME)

The CAD product used to design OLinuXino is Eagle and you can download evaluation free version from their [web \(http://www.cadsoftusa.com/\)](http://www.cadsoftusa.com/).

## Board Layout





## Software

### Linux Commands

[Linux-Commands Brief Linux Command reference](#)

### Python

[pyA10 is Python library for access to A10-OLinuXino-LIME GPIOs, I2C, SPI]

Use:

```
#!/usr/bin/env python
import A10_GPIO as GPIO

#init module
GPIO.init()

#configure module
GPIO.setcfg(GPIO.PIN#, GPIO.OUTPUT)
GPIO.setcfg(GPIO.PIN#, GPIO.INPUT)

#read the current GPIO configuration
config = GPIO.getcfg(GPIO.PIN#)

#set GPIO high
GPIO.output(GPIO.PIN#, GPIO.HIGH)

#set GPIO low
GPIO.output(GPIO.PIN#, GPIO.LOW)

#read input
state = GPIO.input(GPIO.PIN#)

#cleanup
GPIO.cleanup()
```

### GPIO under Linux

GPIOs are located in /sys/class/gpio directory. Note that first you have to export GPIOs. For example:

add gpioPH2

```
root@A10:~# echo 20 > /sys/class/gpio/export
```

make PH2 output

```
root@A10:~# echo out > //sys/class/gpio/gpio20_ph2/direction
```

turn on onboard LED(connected to PH2)

```
root@A10:~# echo 1 > /sys/class/gpio/gpio20_ph2/value
```

turn off onboard LED(connected to PH2)

```
root@A10:~# echo 0 > /sys/class/gpio/gpio20_ph2/value
```

Full list with supported GPIOs is:

```
gpio21_ph7  gpio33_ph20  gpio45_pb12  gpio57_pi2   gpio69_pi14
gpio10_pg11  gpio22_ph9   gpio34_ph21  gpio46_pb13  gpio58_pi3   gpio6_pg5
gpio11_pc3   gpio23_ph10  gpio35_ph22  gpio47_pb14  gpio59_pi4   gpio70_pi15
gpio12_pc18  gpio24_ph11  gpio36_ph23  gpio48_pb15  gpio5_pg4    gpio71_pi16
gpio13_pc19  gpio25_ph12  gpio37_pb3   gpio49_pb16  gpio60_pi5   gpio72_pi17
gpio14_pc20  gpio26_ph13  gpio38_pb4   gpio4_pg3    gpio61_pi6   gpio73_pi18
gpio15_pc21  gpio27_ph14  gpio39_pb5   gpio50_pb17  gpio62_pi7   gpio74_pi19
gpio16_pc22  gpio28_ph15  gpio3_pg2    gpio51_ph24  gpio63_pi8   gpio75_pi20
gpio17_pc23  gpio29_ph16  gpio40_pb6   gpio52_ph25  gpio64_pi9   gpio7_pg6
gpio18_pc24  gpio2_pg1    gpio41_pb7   gpio53_ph26  gpio65_pi10  gpio8_pg7
gpio19_ph0   gpio30_ph17  gpio42_pb8   gpio54_ph27  gpio66_pi11  gpio9_pg8
gpio1_pg0    gpio31_ph18  gpio43_pb10  gpio55_pi0   gpio67_pi12  gpiochip1
gpio20_ph2   gpio32_ph19  gpio44_pb11  gpio56_pi1   gpio68_pi13
```

## Add Voice to your OLinuXino project

Installation of Festival on OLinuXino (<http://olimex.wordpress.com/2013/10/03/make-things-talk-with-olinuxino/>)

## How To?

### How to generate boot-able SD-card Debian Linux image for A20-OLinuXino-LIME?

To be added

Note that Linux-Sunxi Kernel is a work-in-progress, this means you can try the current stage/sunxi-x.x branch but if something is broken and doesn't work just revert to the git tags we give in the blog and they should work for sure

Sunxi u-boot loader (<https://github.com/linux-sunxi/u-boot-sunxi/wiki>) The linux-sunxi git page contains a lot of sources for all Olimex Allwinner boards.

### How to change HDMI, VGA and LCD resolutions?

The default SD card setup is made with settings for HDMI 720p/60Hz. If you want to change to some other LCD, VGA or HDMI resolution then you have to start change\_display.sh script file in /root directory.

Type:

```
./change_display*
```

or

```
./change_display_a10_lime.sh
```

and press "Enter".

Then choose the resolution and the interface(LCD, HDMI). Note that the selection of a specific resolution is done by navigating with the arrow keys and pressing "space" button. Make sure the asterisk marks your selection properly.

The supported resolutions are:

**For LCD:**

- 1. 4.3" (480x272)
- 2. 7" (800x480)
- 3. 10" (1024x600)
- 4. 15.6" (1366x768)

Important: initially the boards are calibrated for a specific display. If you re-write the image (no matter whether the SD card or the NAND memory) you would need to use a mouse to calibrate the display initially. It might be impossible to calibrate it via touching the display.

**For HDMI:**

- 0. 480i
- 1. 576i
- 2. 480p
- 3. 576p
- 4. 720p50
- 5. 720p60
- 6. 1080i50
- 7. 1080i60
- 8. 1080p24
- 9. 1080p50
- 10. 1080p60

**For VGA:** (note that the VGA signals are routed to custom 6 pin connector and you need from adapter to standard VGA connector)

- 0. 1680x1050
- 1. 1440x900
- 2. 1360x768
- 3. 1280x1024
- 4. 1024x768
- 5. 800x600
- 6. 640x480
- 7. 1920x1080
- 8. 1280x720

## How to detect and enable the Ethernet controller (if it is disabled by default)?

Note: in the previous Debian releases the Ethernet was auto-detected and initialized during boot BUT this was causing big delays in the start-up of the board if you didn't want to use Ethernet or if there wasn't Ethernet cable connected.

You can enable it by following these two steps:

1. To check under what name the LAN is associated write "ifconfig -a"
2. If, for example, it is under eth0 name, then write: "dhclient eth0"

This should enable the Ethernet and then SSH would also be available.

## How to add STK1160 video capture driver support in Kernel 3.4

STK1160 ([https://www.olimex.com/wiki/STK1160-howto-linux-sunxi-3\\_4](https://www.olimex.com/wiki/STK1160-howto-linux-sunxi-3_4)) driver backport by Dimitar TomovMain Page

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