

# Ekos Indi Raspberry Pi 4 Image

*Christopher Kovacs August 8, 2021*

## Introduction

This document describes how to install the Ekos Indi Raspberry Pi 4 Image that is based on my YouTube series Ekos/Indi Instll on a Raspberry Pi 4:

Part 1: - Imaging, intial Login --> <https://youtu.be/9Az3Fxm8v48>  
Part 2: - Configuring Desktop, VNC Server, etc --> <https://youtu.be/Ky3w2m8Wrpc>  
Part 3: - Ekos General Use --> <https://youtu.be/7j9wUuQT7po>  
Part4a: - Equipment Setup --> <https://youtu.be/zLzPLjpcEFw>  
Part4b - Observation Tutorial --> <https://youtu.be/fyVrIIdupU>

## Important Release Information

Image is based upon the **Ubuntu 20.04** LTS release.

Ekos Indi Packages at time of imaging (August 8, 2021):

```
indi-aagcloudwatcher-dbg/focal 1.4~202101091006~ubuntu20.04.1 arm64
indi-aagcloudwatcher-ng-dbg/focal 1.6~202107070856~ubuntu20.04.1 arm64
indi-aagcloudwatcher-ng/focal, now 1.6~202107070856~ubuntu20.04.1 arm64
[installed,automatic]
indi-aagcloudwatcher/focal 1.4~202101091006~ubuntu20.04.1 arm64
indi-aok-dbg/focal 1.1~202106282114~ubuntu20.04.1 arm64
indi-aok/focal, now 1.1~202106282114~ubuntu20.04.1 arm64 [installed,automatic]
indi-apogee-dbg/focal 1.9~202107070055~ubuntu20.04.1 arm64
indi-apogee/focal, now 1.9~202107070055~ubuntu20.04.1 arm64
[installed,automatic]
indi-armadillo-platypus-dbg/focal 1.0~202107071635~ubuntu20.04.1 arm64
indi-armadillo-platypus/focal, now 1.0~202107071635~ubuntu20.04.1 arm64
[installed,automatic]
indi-asi-dbg/focal 1.9~202106280200~ubuntu20.04.1 arm64
indi-asi/focal, now 1.9~202106280200~ubuntu20.04.1 arm64 [installed,automatic]
indi-astrolink4-dbg/focal 0.1~202107070904~ubuntu20.04.1 arm64
indi-astrolink4/focal 0.1~202107070904~ubuntu20.04.1 arm64
indi-astromechfoc-dbg/focal 0.2~202107071716~ubuntu20.04.1 arm64
indi-astromechfoc/focal, now 0.2~202107071716~ubuntu20.04.1 arm64
[installed,automatic]
indi-atik-dbg/focal 2.6~202107062207~ubuntu20.04.1 arm64
indi-atik/focal, now 2.6~202107062207~ubuntu20.04.1 arm64
[installed,automatic]
indi-avalon-dbg/focal 1.12~202107070054~ubuntu20.04.1 arm64
indi-avalon/focal, now 1.12~202107070054~ubuntu20.04.1 arm64
[installed,automatic]
indi-bin/focal, now 1.9.1~202107052238~ubuntu20.04.1 arm64
[installed,automatic]
indi-bresserexos2-dbg/focal 1.0~202106280945~ubuntu20.04.1 arm64
```

indi-bresserexos2/focal, now 1.0~202106280945~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-celestronaux/focal, now 0.7~202107061108~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-dbg/focal 1.9.1~202107052238~ubuntu20.04.1 arm64  
indi-dreamfocuser-dbg/focal 2.1~202107071724~ubuntu20.04.1 arm64  
indi-dreamfocuser/focal, now 2.1~202107071724~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-dsi-dbg/focal 0.4~202107071713~ubuntu20.04.1 arm64  
indi-dsi/focal, now 0.4~202107071713~ubuntu20.04.1 arm64 [installed,automatic]  
indi-duino-dbg/focal 1.15~202107071724~ubuntu20.04.1 arm64  
indi-duino/focal, now 1.15~202107071724~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-eqmod-dbg/focal 1.0~202106280211~ubuntu20.04.1 arm64  
indi-eqmod/focal, now 1.0~202106280211~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-ffmv-dbg/focal 0.3~202107070901~ubuntu20.04.1 arm64  
indi-ffmv/focal, now 0.3~202107070901~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-fishcamp-dbg/focal 1.1~202107071646~ubuntu20.04.1 arm64  
indi-fishcamp/focal, now 1.1~202107071646~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-fli-dbg/focal 1.5~202107062148~ubuntu20.04.1 arm64  
indi-fli/focal, now 1.5~202107062148~ubuntu20.04.1 arm64 [installed,automatic]  
indi-full/focal, now 1.9.1~202106280946~ubuntu20.04.1 arm64 [installed]  
indi-gphoto-dbg/focal 3.0~202107061108~ubuntu20.04.1 arm64  
indi-gphoto/focal, now 3.0~202107061108~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-gpsd/focal, now 0.5~202107062148~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-gpsnmea/focal, now 0.2~202107071634~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-inovaplx-dbg/focal 1.4~202107071647~ubuntu20.04.1 arm64  
indi-inovaplx/focal 1.4~202107071647~ubuntu20.04.1 arm64  
indi-maxdomeii-dbg/focal 1.3~202107071646~ubuntu20.04.1 arm64  
indi-maxdomeii/focal, now 1.3~202107071646~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-mgen/focal, now 0.1~202107070856~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-mi-dbg/focal 1.8~202107070054~ubuntu20.04.1 arm64  
indi-mi/focal, now 1.8~202107070054~ubuntu20.04.1 arm64 [installed,automatic]  
indi-nexdome-dbg/focal 1.5~202107071647~ubuntu20.04.1 arm64  
indi-nexdome/focal, now 1.5~202107071647~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-nexstarevo/focal 0.4~202101090810~ubuntu20.04.1 arm64  
indi-nightscape-dbg/focal 1.0.6~202107071721~ubuntu20.04.1 arm64  
indi-nightscape/focal, now 1.0.6~202107071721~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-pentax-dbg/focal 1.0~202107070055~ubuntu20.04.1 arm64  
indi-pentax/focal, now 1.0~202107070055~ubuntu20.04.1 arm64  
[installed,automatic]  
indi-qhy-dbg/focal 2.7~202107061109~ubuntu20.04.1 arm64  
indi-qhy/focal, now 2.7~202107061109~ubuntu20.04.1 arm64 [installed,automatic]  
indi-qi-dbg/focal 0.9~202107062147~ubuntu20.04.1 arm64  
indi-qi/focal, now 0.9~202107062147~ubuntu20.04.1 arm64 [installed,automatic]  
indi-sbig-dbg/focal 2.1~202107062146~ubuntu20.04.1 arm64  
indi-sbig/focal 2.1~202107062146~ubuntu20.04.1 arm64  
indi-shelyak-dbg/focal 1.0~202106282148~ubuntu20.04.1 arm64

```

indi-shelyak/focal,now 1.0~202106282148~ubuntu20.04.1 arm64
[installed,automatic]
indi-ssag-dbg/focal 1.0~202001021227~ubuntu20.04.1 arm64
indi-ssag/focal 1.0~202001021227~ubuntu20.04.1 arm64
indi-starbook-dbg/focal 0.8~202107070900~ubuntu20.04.1 arm64
indi-starbook-ten-dbg/focal 0.1~202107120705~ubuntu20.04.1 arm64
indi-starbook-ten/focal,now 0.1~202107120705~ubuntu20.04.1 arm64
[installed,automatic]
indi-starbook/focal,now 0.8~202107070900~ubuntu20.04.1 arm64
[installed,automatic]
indi-sv305/focal,now 1.2.3~202107070050~ubuntu20.04.1 arm64
[installed,automatic]
indi-sx-dbg/focal 1.15~202107062148~ubuntu20.04.1 arm64
indi-sx/focal,now 1.15~202107062148~ubuntu20.04.1 arm64 [installed,automatic]
indi-talon6-dbg/focal 2.0~202107070055~ubuntu20.04.1 arm64
indi-talon6/focal,now 2.0~202107070055~ubuntu20.04.1 arm64
[installed,automatic]
indi-touphbase-dbg/focal 0.5~202107062148~ubuntu20.04.1 arm64
indi-touphbase/focal,now 0.5~202107062148~ubuntu20.04.1 arm64
[installed,automatic]
indi-webcam-dbg/focal 1.0~202106282205~ubuntu20.04.1 arm64
indi-webcam/focal 1.0~202106282205~ubuntu20.04.1 arm64

```

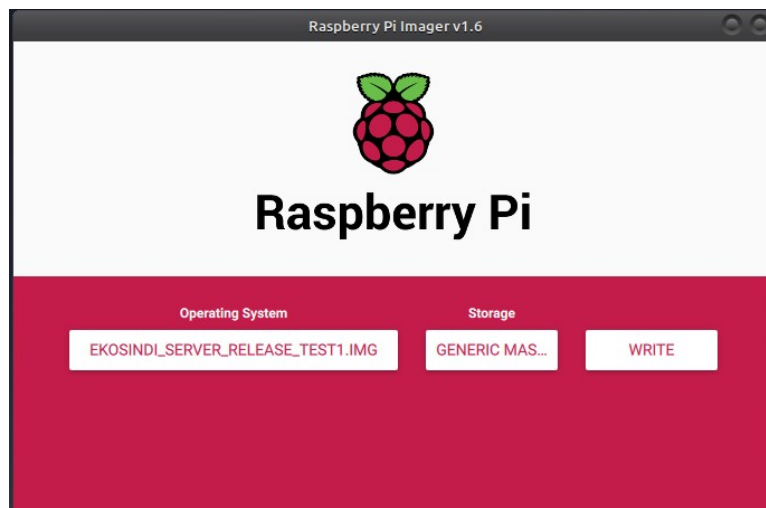
To find specific versions, use the following command:

```
apt-show-versions <package_name>
```

PHD2 Version 2.6.10

## Creating the SD from the Image file

Use the Raspberry Pi Imager. For the Operating system, choose "Use Custom" and select the image from the download directory. Remember, this image may be compressed and will need to be uncompressed before selecting the "Operating System". For the Storage device, select the SD storage device. The SD device must be 16Gb or greater. Then simply press the "WRITE" button. When the Warning Message is display, review and continue if correct.



# Login Access Information

Ekos User Password: **Ekos-Indi**

X11vnc Password: **Ekos-Indi**

## VNC Server (x11vnc) - Service

The x11vnc server is present but is disabled. If you want to use this service, follow the steps below:

1. If you want this service to be started at every boot (persistent), enter the following command:

```
sudo systemctl enable x11vnc.service
```

2. Start Service, enter the following commands:

```
sudo systemctl daemon-reload  
sudo systemctl start x11vnc.service
```

3. Check Service Status, enter the following command:

```
sudo systemctl status x11vnc.service
```

4. To stop the service, enter the following command:

```
sudo systemctl stop x11vnc.service
```

## Desktop hdmi Mode Settings

The following modes were setup on the raspberry pi 4:

hdmi port 1 - 1920x1080, 60Hz, 16:9

hdmi port2 - 1920x1080, 60Hz, 16:9

If you need to change the hdmi\_mode values, you will need to edit */boot/firmware/usercfg.txt* and reboot the Pi.

```
sudo nano /boot/firmware/usercfg.txt
```

## Current settings:

```
# Place "config.txt" changes (dtparam, dtoverlay, disable_overscan, etc.) in
# this file. Please refer to the README file for a description of the various
# configuration files on the boot partition.

# hdmi_mode=35 (1280x1024, 60Hz, 5:4)
# hdmi_mode=82 (1920x1080, 60Hz, 16:9)
# hdmi_mode=85 (1280x720, 60Hz, 16:9)
hdmi_force_hotplug=1

[HDMI:0]
hdmi_group=2
hdmi_mode=82
hdmi_drive=2

[HDMI:1]
hdmi_group=2
hdmi_mode=82
hdmi_drive=2
```

If the screen resolution needs to be reduced, search the web for “Raspberry Pi hdmi modes” or see web site for more information:

<https://www.raspberrypi.org/documentation/configuration/config-txt/video.md>

## Changing WiFi Access

Currently, the image does not have a wifi password set. You will need to either use a hardwired Ethernet connection or a monitor and keyboard.

### Using Hardware Network Connections

Plug in your network connection into the RJ45 connector on the Pi. The system will use a dhcp connection to establish the Ethernet address and dns naming service. Once connected, you can log into the server with the assigned IP address using an ssh client such as a Linux terminal program or on Windows, putty. The login name is "**ekos**" and the default password is "**Ekos-Indi**".

If you don't have access to a hardware connection, then you must use an hdmi monitor and usb keyboard. The ports HDMI connector is setup for 1920x1080, 60Hz, 16:9.

Once the monitor/keyboard is attached, you can boot the Pi. You should see the monitor come to life with boot up messages. Eventually, the monitor will display a login prompt. If you don't have a mouse attached, press "Control-Alt" keys together and then press F3. This will show you a Terminal Display. Now you can login to the Pi.

To add your wifi ssid/password, use the following command:

```
sudo /usr/local/bin/wifi_setup.sh
```

The following will be displayed:

```
Wifi Module: wlan0
What is the wifi ssid you want to connect to (Case sensitive)? mywifissid
What is the wifi password? mypasswordforwifi
Creating new file using:
  renderer: NetworkManager
  version: 2
  wifis:
    wlan0:
      dhcp4: true
      optional: true
      access-points:
        "mywifissid":
          password: "mypasswordforwifi"
Applying the new net plan...
```

If you need to review the file, it's located at "/etc/netplan/50-cloud-init.yaml"

If you've entered the correct ssid, and password, you should now be connected to your wifi network. If you still have issues, or made a mistake in your entries, you can re-execute the wifi\_setup.sh script:

```
sudo /usr/local/bin/wifi_setup.sh
```

## Conclusion

I have only testing this image using my locale. I may update this image to reflect new scripts or modifications to the image.

The latest image can be found on GitHub:

**[https://github.com/w0anm/Ekos-Indi\\_RPi\\_Image](https://github.com/w0anm/Ekos-Indi_RPi_Image)**