

Ekos Indi Raspberry Pi 4 Image

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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/fyVrlJIdupU>

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

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 hardwire connection, the 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 live 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