

Installation of the Thomas Jacquin Allsky Software on a Raspberry Pi-4

Version 2.1
Bill Kowalik
IDA Oregon
Feb 28, 2021

Installing the All Sky Camera software

The following slide covers two situations:

- 1) You previously installed the all-sky camera software and you want to update that software because there is a new improved version available on GitHub.
- 2) You are installing the all-sky camera software from GitHub for the first time on this RPI

For background, here are links to the Thomas Jacquin allsky camera:

Description of Allsky camera:

<https://www.instructables.com/id/Wireless-All-Sky-Camera/>

Github site with the software for the raspberry Pi which runs the all sky camera.

<https://github.com/thomasjacquin/allsky>

Here's a link to an operating all-sky camera in Bend, Oregon

<http://www.cbstarrynights.com/allsky1/>

Updating All Sky Camera software

Case – you previously setup the allsky software on a Raspberry Pi and now wish to update allsky, because the ecosystem of users and programmers around allsky have created enough changes to give the original developer, Thomas Jacquin impetus to create a new github version of allsky.

Before updating the software, first copy config and settings files and any files with changes that you may have made to a different folder outside of allsky – like to a new folder old_allsky, stop the allsky process and delete the old allsky folder – steps to type into a terminal on the RPI are listed below

1. `cp config.sh, settings.json` and all the scripts currently in use in allsky to `/home/pi/old_allsky`
2. `sudo service allsky stop`
3. `cd` to your home folder and `“rm -rf allsky”` (this deletes the old allsky software and folders)
4. See next slides for Installation of the new version of allsky software

Installing All Sky Camera software



Log onto the RPI as user “pi” through the VNC software

- Open a terminal window (click on terminal icon at top of screen)
- Type the following command “sudo apt-get install git” (this installation software may already be installed, if so, it will tell you, or it may update the existing version of the install software on the RPI)
- In the terminal window, type this command
“git clone --recursive <https://github.com/thomasjacquin/allsky.git> ”
- After that completes, change directories to the allsky folder by this command
“cd allsky ”
- Type this command to unpack and setup the allsky software on the RPI
“sudo ./install.sh” You may get some warnings upon the compile of the software, ignore them; If instead there are errors, not just warnings, then something is wrong.
- If install is successful – it will ask if you want to reboot now; If your camera is already plugged into the RPI, say YES. Otherwise say NO and see the next slide. If you are Updating the software, say NO and proceed to update the config and settings files that you previously used.

Plugging in the Camera – skip if already done

- Next we will shut down the RPI because we will plug in the camera next. To shut it down gracefully, type this command “sudo shutdown –h now”
- Disconnect power from the RPI (you will hear the fan stop running)
- Connect the ASI178MC camera to the RPI via the right angle USB cable; plug it into one of the blue USB ports on the RPI; the blue USB ports are USB-3, which are much faster than the other USB ports

ZWO ASI178MC camera
plugged into blue USB port



- Plug in the power to the RPI; it will boot up and allsky will automatically begin running; you can use the ImageMagick program on the RPI GUI to display the “/home/pi/allsky/liveview-image.jpg” picture which will continuously be written to the allsky folder

Here are some helpful commands

- Check to see if the program allsky is running (after reboot it is supposed to begin running automatically) “sudo service allsky status” (to exit from the status window, do a “ctrl c”)
- If allsky is not running for some reason, you can do a manual start from the allsky folder “./allsky.sh” or use the “allsky_start” command below
- To stop the allsky program “sudo service allsky stop”
- To start the allsky program “sudo service allsky start”
- To generate a timelapse manually – from the allsky folder type the following:
./scripts/timelapse.sh 20190322 (where 20190322 is an existing folder with images to convert into a movie)
- For convenience, copy shortcuts to these commands to a file called “.bash_aliases” in the “/home/pi” folder

```
alias allsky_stop='sudo service allsky stop'  
alias allsky_start='sudo service allsky start'  
alias rm='rm -i'  
alias allsky_status='sudo service allsky status'  
alias allsky_disable_on_start='sudo systemctl disable allsky.service'  
alias allsky_enable_on_start='sudo systemctl enable allsky.service'  
alias allsky_procs='ps -ef | grep allsky'  
alias stopstop='sudo shutdown -h now'  
alias pitemp='/home/pi/pitempmon.sh'  
/home/pi/pitempmon.sh
```

Note: the “pitemp” command shows the temperature of the RPI in degrees C and degrees F; for this to work, you need to create a file called “pitempmon.sh” in the “/home/pi” folder. The file contains these statements, which you can cut and paste from here

After you add these commands to the .bash_aliases file, You have to “engage” the commands by updating them. To do that give this command in the /home/pi folder: “source .bashrc”

You will likely get a message on the pitempmon.sh command, “Permission denied” – this is because your pitempmon.sh command does not have executable privilege – so give this command: “chmod a+x pitempmon.sh”
Now type “pitemp” to see if you get the temperature of the RPI

```
#!/bin/bash  
  
printf "%-9s%9s\n" "Temp(C)" "Temp(F)"  
printf "%20s\n" "-----"  
  
TempC=$(vcgencmd measure_temp | egrep -o '[0-9]*\.[0-9]*')  
TempF=$(echo "scale=2; 1.8 *$TempC +32" | bc)  
printf "%5s   %5s\n" "$TempC" "$TempF"
```

Focusing the All-sky Camera

- This is an iterative process of manually rotating the camera lens in a small increment, while checking an image captured for focus on the screen of your Windows or Mac host machine
- It will be best for this process if your host machine is a laptop that you can move to a place with a distant view
- Take the camera assembly out of the weatherproof case and point the camera to a distant view, ideally a star-filled sky on a clear night
- There are a number of programs that you can use on your Windows or Mac machine – the most simple may be to use the “Image Viewer” program on the RPI, displayed back to your host machine via the VNC window. Start the allsky program on the RPI if it is not already running. The allsky program continuously captures a new image called “liveview-image.jpg” in /home/pi/allsky To check the focus, start the “Image Viewer” program on the RPI, Right Click/OpenFile/select liveview-image.jpg. Then, adjust focus, and to update the image, just click the rightward-pointing arrow at the bottom left side of the “Image Viewer” GUI
- Alternately, you can use the [ZWO ASICAP software](#) on your Windows or Mac machine; Connect the camera to the USB port on your host machine and run the ASICAP software; this software provides a continuous video image to the display screen, allowing you to watch how the focus adjusts as you rotate the lens of the camera
- When satisfied with the focus, tighten the screw on the camera lens to fix the focus in place

Additional Helpful slides follow

A GUI is available for allsky. You can use the allsky GUI to modify set your and camera options, which may be easier than editing the config.sh and the settings.json files

However, installation of the GUI makes changes to your setup which may cause complications. In particular, your RPI hostname may change and the location of your config.sh and settings_camera.json file will change from /home/pi/allsky to /etc/raspap/ And you will still have leftover files of those names in /home/pi/allsky, which may be confusing. I found it easier to just manually change parameter instead of using the GUI.

If you want to install the GUI – here are the instructions:

How to install the allsky GUI on your RPI

- the GUI software was downloaded automatically with allsky
 - cd to allsky
 - sudo ./gui/install.sh rpiname (if you don't specify a rpiname here, your RPI hostname will be changed to "allsky")

How to display allsky GUI on your RPI

- On RPi, open web browser
- Go to yourRPIhostname.local
- Or yourRPI_ipaddress
- You should see the GUI with various options.

Some Useful Linux Commands

- Add “sudo” in front of the following commands if the file is owned by root or some other user (sudo give root permissions)
- `chmod a+w filename` (make the file writeable by all)
- `chown -R pi ./foldername` (change ownership of the folder and all below to “pi”)
- `chgrp -R pi ./foldername` (change group of the folder and all below)

Notes on allsky permissions – this seems **not** to be an issue with the current github distribution of all-sky software

After install of allsky in Feb 2021, I found that many files and folders were owned by root. I changed them all to be owned by pi and in the “pi” group by cd to allsky then “sudo chown -R pi *” and “sudo chgrp -R pi *”

To avoid the above problem of folders owned by root, replace “logname” in the allsky “install.sh” script by “pi” It turns out that on some Rpi’s (like the canakit ones) that the linux command “logname” is not implemented. So manually replacing “logname” in the install.sh script prior to executing it will apparently solve this ownership and group root problem.

After installing the web interface to allsky, the active config.sh file is located in /etc/raspap/config.sh (not the one at ./allsky/configsh) and all those files in /etc/raspap are owned by “www-data” and are members of the group “www-data”

There are “services” involved in running allsky which are intentionally owned by root
/lib/systemd/system/allsky.servicels -

Where are the Allsky operations log files?

The all sky camera program writes log data to `/var/log/allsky.log`

The capture program writes log data to `/home/pi/allsky/log.txt`

These log files will increase in size over time. There is a linux process called “logrotate” which is set by default to compress and remove files periodically. If you are running out of space on the memory card, you might find that you have large log files. Deleting the log files manually is an option – here are some commands

```
cd /var/log (change directory to the log file directory)
```

```
ls -altr (list the files in this directory in order of age, most recent ones last)
```

```
rm allsky.log (delete the allsky.log file)
```

Movie not being created each morning?

If the movie is not created for some reason, try creating it manually

1. `cd` to `/home/pi/allsky/`
2. `./scripts/timelapse.sh 20210203` (ie. The folder in which the missing movie should be located)

Note that the timelapse script first makes a copy of all the images into a new “sequence” folder, and renames all the images in order (0000.jpg, 0001.jpg... , 1499.jpg), then runs `ffmpeg` to read each image and create the mp4 video; the sequence folder is then deleted