User Manual

PanoCatcher Dual Axis Controller

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1. GETTING STARTED

1a. HOW TO CONNECT TO THE CONTROLLER

You can connect to the PanoCatcher controller from any device that has Wi-Fi and a web browser.

1. Turn on the controller
2. On your smartphone or other device look for the Wi-Fi network named **PanoCatcher**
3. Connect to it, the password is: **12345678**
4. Open the web browser and go to this address: **http://192.168.8.8**

1b. HOW TO IMPROVE THE WI-FI CONNECTION

The Wi-Fi connection does not provide access to the Internet. As a result, some devices may drop this connection and connect to another saved network that does provide access to the Internet. To avoid such issues you may try the following:

1. Disable the Auto-Connect option of other Wi-Fi networks stored on your device and/or
2. Use Static IP for the Wi-Fi connection to the controller using the following settings:
    - Static IP: 192.168.8.10
    - Subnet Mask: 255.255.255.0
    - Gateway (or Router): 192.168.8.8
    - DNS: 192.168.8.8

If you are not sure how to setup static IP for your device, do a Google search for: "How to setup static IP on ...." whatever device you are using, ie Android, iPhone, Windows, Linux, etc.

1c. INITIALIZE

It is very important that you perform an initialization every time you turn on the controller.

To initialize go to: REMOTE CONTROL / INITIALIZE

Use the arrow keys to point the camera to either:

- Horizontally and tap the INITIALIZE HORIZONTAL button or
- the zenith and tap the INITIALIZE ZENITH button

You must initialize every time you turn the controller on. This tells the controller the initial position of the tilt arm.

After the initialization the controller keeps track of the arm position for as long as the controller remains turned on.

1d. FIRMWARE UPDATES

There are frequent firmware updates.

Visit the page **https://panocatcher.com/fw** to download the latest firmware.

Unzip the file you downloaded. Inside you'll find 2 files:

- **filesystem.bin**
- **firmware.bin**

Make sure the battery is sufficiently charged.

Go to SETTINGS. Scroll all the way to the bottom and tap the **FW Update** link.

Before you proceed with the update it's a good idea to take a screenshot of the settings page because you'll need to reset the settings values after the update.

On the Update page upload the firmware.bin file and then the filesystem.bin file and turn the controller off and on.

Go to the SETTINGS page again and make sure you have the correct setting values.

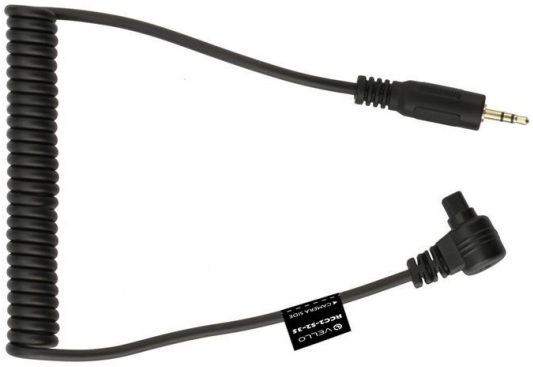
2. CONTROLLER PORTS

There are 4 ports on the controller. Starting from the top:

Ports 1 & 2 (CAM1 & CAM2): These ports are used to connect your camera(s). You can have 2 cameras connected and they will be triggered by the controller simultaneously. The cables used for this connection have a 2.5mm stereo jack on the controller side and a customized connector on the other end that connects to the camera's wired shutter release port.

If you want to use the controller with different brand cameras all you need is to buy the appropriate cable.

These cables are inexpensive and easy to find from online or local retailers, just search for “2.5mm coiled shutter cable for...” whatever camera model you use.



Port 3 (AUX1): Is used to connect the camera feedback cable. The other end connects to the camera's flash pc-sync port. The cable used for this connection has a 2.5mm mono jack on the controller side and a pc-sync jack on the other end that connects to the camera. These cables are inexpensive and easy to find from online or local retailers, just search for “2.5mm coiled pc-sync flash cable”. They are the same for all cameras.

If your camera does not have a pc-sync port you can buy a hot shoe adapter. It does not have to be specifically made for your camera, inexpensive, generic ones work just fine. You can find them on Amazon and other online or local retailers.

Something like this:

https://www.amazon.de/-/en/dp/B0CQTK5HQS/?crid=1L8ED7JF772OW or

https://www.aliexpress.com/item/1005002320810164.html

Port 4 (AUX2): Is used to connect a wired remote.

This remote can be used to Pause/Restart the shooting process or to control movement to the next position manually.

This type of wired remote is normally used with Canon cameras such as the EOS 700D, EOS 650D, etc. It is inexpensive and can be purchased from oline or local retailers.

Here are a couple of links:

https://www.bhphotovideo.com/c/product/765659-REG/

https://www.amazon.com/dp/B00A83H2XC

3. 360° PANORAMA

Use this to shoot 360°x180° panoramas. Any values you change are saved in the controller.

Camera Type

Select your camera type from the list according to the sensor size.

Orientation

Select the orientation of the camera

Lens Type

Select the type of lens used.

Focal Length

Enter the lens focal length.

Overlap

Enter the image overlap.

Bracketing

Specifies the number of bracketed shots to be taken at each shooting position. Must be equal to the number of bracketed shots you have specified in your camera

Startup Delay

How long to wait before it starts executing the panorama.

Before Shot Delay

How long to wait before the shutter is released when it moves to a new shooting position. Useful for dissipating vibrations from the head movement.

After Shot Delay

How long to wait after the shutter is released. If you enter -1 and have connected the Aux1 controller port (3rd from the top) to the camera's flash pc-sync port the controller will receive feedback from the camera and will know when the shot has been captured and it's

safe to proceed to the next shooting position and will do so automatically.

Speed

Enter the X-axis speed in RPM (rounds per minute).

The Y-axis speed will be the default speed as set in the Default Speed field in Settings.

Direction

Select the X-axis direction of movement.

Times to execute

You can capture multiple panoramas. Enter how many times you wish to execute the panorama capture process.

Delay Between

How long to wait between panoramas

Return to Start

How to return to the starting position once the shooting process has been completed.

The **Quick** option takes the shortest path.

The **Backtrack** option follows the reverse movement of that used while shooting. This option is useful in case you are using a plugged-in power supply and you want to avoid the power cable being wound around the head as you shoot multiple panoramas.

Wired Remote

Here you can select how to use the wired remote connected to port AUX2.

The option **Pause/Continue** will pause and resume the shooting process on the press of the switch.

The option **Manual Advance** will move the head automatically to the next shooting position where it will stop and wait until the switch pressed. It will then take the shot and will proceed to the next shooting position to repeat the process.

Single Row

It will only execute one single row of shooting. You must place the tilt arm at the desired position manually before you start the execution.

Essentially, this option allows use of a dual axis head as single axis.

XML File (Papywizard)

A new XML file is created every time you shoot a new panorama. This file can be used by stitching software such as PTGui to greatly speed up and improve the stitching process. If you need it, tap this link to download it before shooting another panorama because it will be overwritten.

4. GIGAPIXEL / PARTIAL PANORAMA

FRAME CORNERS

Before using this option you must define the upper left and lower right corners of the image you want to capture.

You can do this on the **Remote Control / Initialize** page.

If you have not defined the frame limits, when you tap the Gigapixel / Partial Panorama button on the homepage you will be taken to the Remote Control / Initialize page.

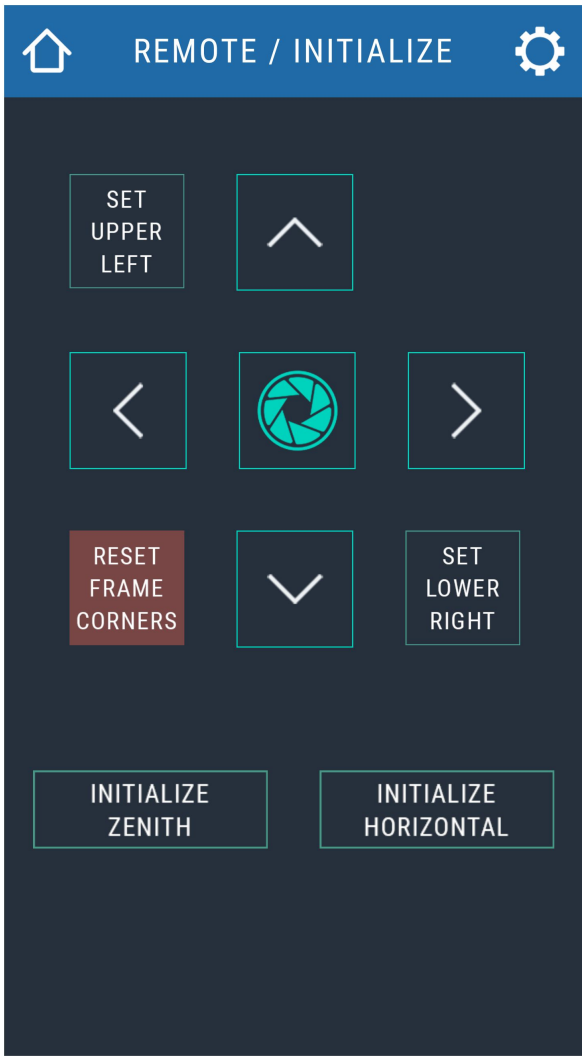
PARAMETERS

The parameters are the same as for 360° Panorama.

The only difference is that for this type of capture only rectilinear lenses are supported.

5. REMOTE / INITIALIZE

5a. INITIALIZE



It is very important that you perform an initialization every time you turn on the controller.

To initialize Use the arrow keys to point the camera to either:

- Horizontally and tap the INITIALIZE HORIZONTAL button or
- the zenith and tap the INITIALIZE ZENITH button

You must initialize every time you turn the controller on. This tells the controller the initial position of the tilt arm. After the initialization the controller keeps track of the arm position for as long as the controller remains turned on.

5b. DEFINE GIGAPIXEL / PARTIAL PANORAMA CORNERS

Before using the Gigapixel / Partial Panorama option you must define the limits of the frame you wish to capture.

This is done by setting the upper left and lower right corners of the frame.

- Use the arrow keys to point the camera to the upper left corner of the frame
- Tap the SET UPPER LEFT button
- Use the arrow keys to point the camera to the lower right corner of the frame
- Tap the SET LOWER RIGHT button

You must set the upper left corner first and then the lower right corner.

After you set the frame limits you can go to the Gigapixel / Partial Panorama page to start the capture process.

5c. WIRELESS REMOTE CONTROL

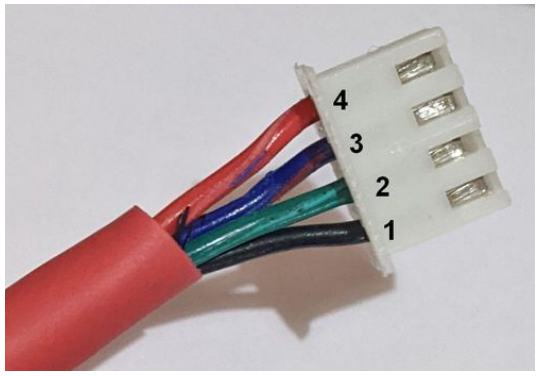
Use the arrow keys to move the robotic head.

Use the shutter key in the middle to take a photo.

The speed of movement can be adjusted in the Settings in the Default Speed (RPM) field.

5d. FOR MAESTRO & TITAN USERS

When you press the UP arrow the tilt arm should move up (CCW). When you press the RIGHT arrow, the head should move CW looking from the top. If you find yours to move in different direction you can swap the pins 3 & 4 of the motor cable



6. CUSTOM PANORAMA

Use this to create a fully customized shooting scenario using a script file.

6a. THE SCRIPT FILE

The script file is a plain text file that contains a set of instructions. Can be named anything but the extension must be **.txt.** The first part of the file contains

```
//--- Settings ---
setSpeed(20)
startUpDelay(0)
bracketing(1)
delayBefore(200)
delayAfter(500)
wiredRemote(1)
timesToExecute(1)
delayBetween(0)
//--- Custom Motion / Pano ---
goTo(45|30)
shoot
goTo(90|-30)
shoot
goTo(135|30)
shoot
goTo(180|-30)
shoot
goTo(225|30)
shoot
goTo(270|-30)
shoot
goTo(315|30)
shoot
goTo(360|-30)
shoot
goTo(0|0)
//--- End ---
```

SETTINGS PARAMETERS

You do **not** have to include all settings parameters. If needed, the default values will be used.

- **setSpeed(n):** Set speed in RPM. Default is 10
- **startUpDelay(n):** How long to wait before starting to execute the script. In sec. Default is 0.
- **bracketing(n):** Specifies the number of bracketed shots to be taken at each shooting position. Must be equal to the number of bracketed shots you have specified in your camera. Default is 1.
- **delayBefore(n):** How long to wait before the shutter is released when it moves to a new shooting position. Useful for dissipating vibrations from the head movement. In ms. Default is 500.
- **delayAfter(n):** How long to wait after the shutter is released. In ms. Default is 1000.

If you enter -1 and have connected the Aux1 controller port to the camera's flash pc-sync port the controller will receive feedback from the camera and will know when the shot has been captured and it's safe to proceed to the next shooting position and will do so automatically.

- **wiredRemote(n):** How to use the wired remote if one is connected to port AUX2.

n=1: **Not used**

n=2: **Pause/Continue**. Will pause and resume the shooting on the press of the switch.

n=3: **Manual Advance.** The head will move to the next shooting position where it will wait until the switch is pressed. It will then take the photo and will move to the next shooting position. Default is 1.

- **timesToExecute(n):** how many times to execute the panorama script. Default is 1.
- **delayBetween(n):** How long to wait between executions. In sec. Default is 0.

The second part of the script contains

MOVEMENT AND SHOOTING COMMANDS.

- **goTo(x|y):** Move to x,y coordinates. In °degrees.
- **focus:** Perform focus
- **shoot:** Release the shutter as many times as indicated by the parameter **bracketing**
- **pause(n):** Pause n seconds

Execution of the script will repeat as many times as indicated in parameter **timesToExecute(n).**

THE COORDINATE SYSTEM

The coordinate system is the same as that used in Papywizard XML files.

x-axis: The point where it starts execution of the panorama is 0°.

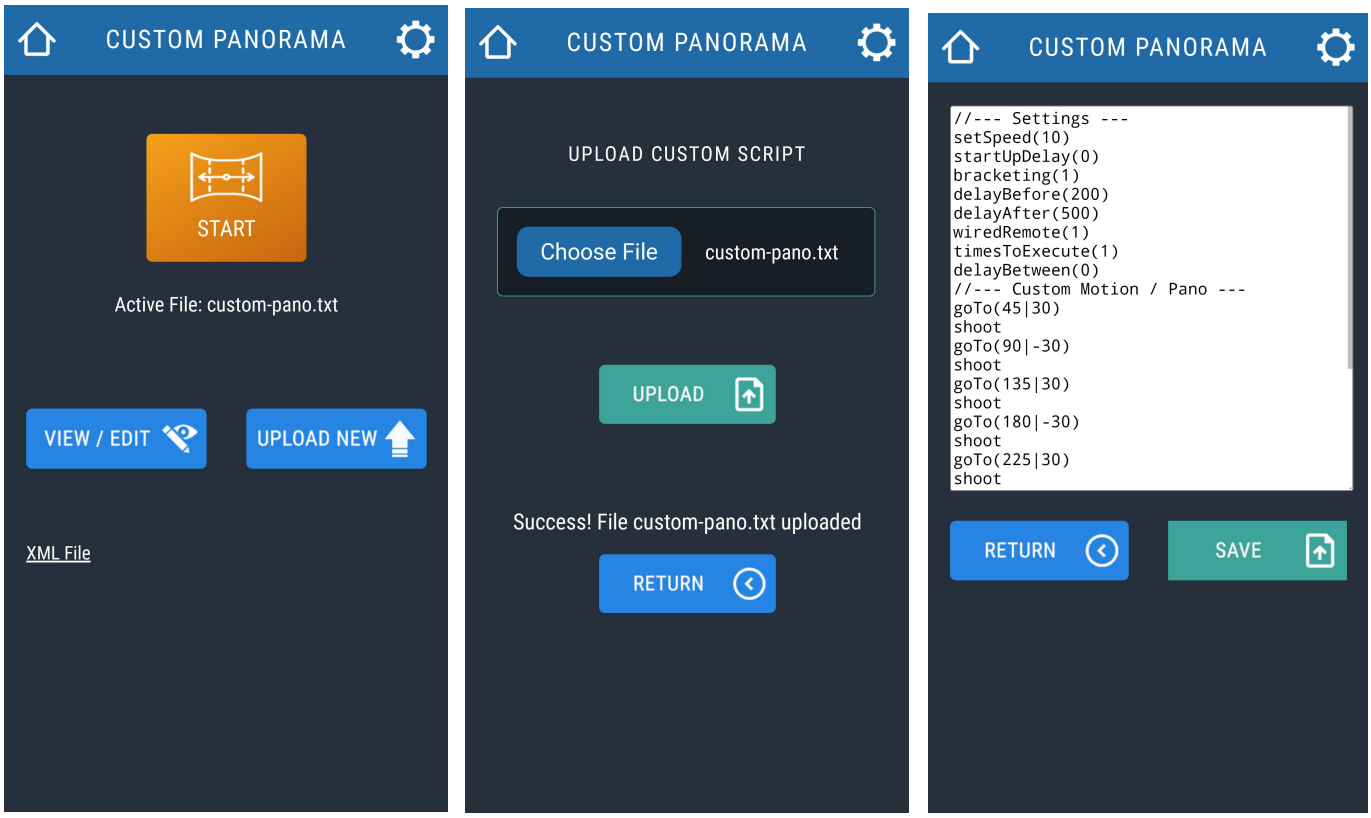
Position values increase in the CW direction.

y-axis: Camera facing horizontally is position 0°.

Facing at the zenith is 90° and facing at the nadir is -90°.

Position values increase in the CW direction.

6b. HOW TO USE



When you go to the Custom Panorama screen, you'll notice that there is already an active script file in memory, the last one you uploaded. If you want to use this file simply tap the START button.

There are also self-explanatory options to upload a new file or to edit the active one.

If you edit the active file, the description below the START button will add the text [Mod] to the file name to indicate that it has been modified.

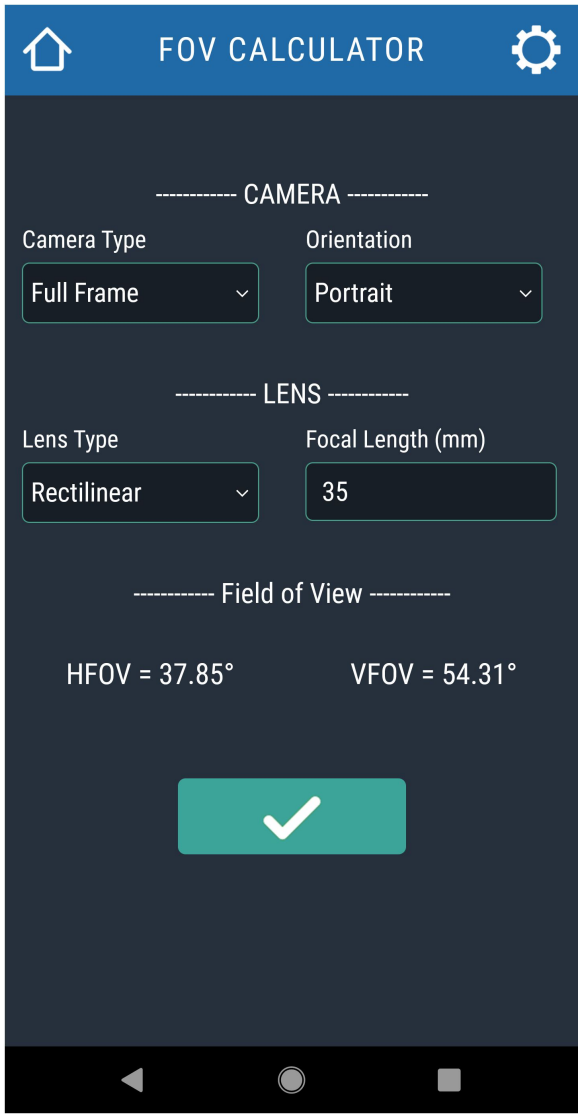
Uploading a custom script file is very quick and easy and you can keep several custom script files on your device and upload them for use as needed.

7. FOV CALCULATOR

Utility to calculate:

- horizontal field of view (HFOV)
- vertical field of view (VFOV)

for different camera/lens combinations.



8. SETTINGS

	Pivot	Maestro 4HD	Titan
X-Motor Steps	200	200	200
x-Gear Ratio	1	1	5.18
x-Drive Ratio	3	3*	30
x-Microstep	16	16	4
y-Motor Steps	200	200	200
y-Gear Ratio	50**	5.18	5.18
y-Drive Ratio	1	30	30
y-Microstep	4	4	4

* Some Maestro 4HD may have a x-Drive Ratio of 4 or 3.75.

** Some early Pivots have a y-Gear Ratio of 99.05.