en/CameraConnect

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1 Prolog

With the MikroKopter you can also carry a camera. Depending on the size of the camrea you can use an appropriate camera mount device.
If you want to trigger the camera from a distance you need to have here an additional module. That can be in example the ShutterCable or the Extension-PCB.

Here now the links for the needed parts:

- Camera mounts and ShutterCable: Shoplink
- Extension-PCB: Shoplink (Wikilink for Extension-PCB: ExtensionPCB)

2 Connection and Control of the Camera Mount

An attached camera mount through the Kopter you can control via the FlightCtrl.
The camera mount will be kept balanced via servos in Nick- and Rolldirection (depending on the camera mount).
If you want to adjust the tilt of the camera mount further from the ground by the transmitter it is also possible. Here you need to assign a free channel on your trasmitter to a potentiometer. That potentiometer will be set via the KopterTool to control the camera mount.

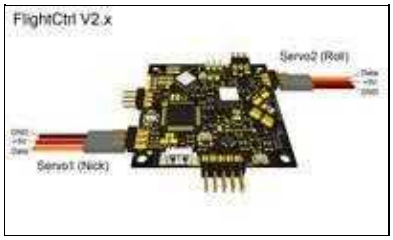
2.1 Connection of the camera mount to the FlightCtrl

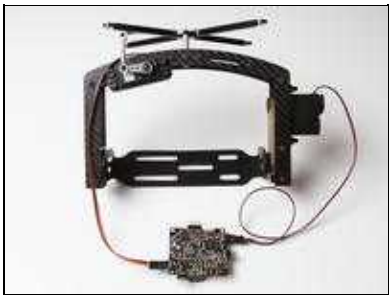
After the camera mount has been assembled to the Kopter you can connect the servos to the FlightCtrl.
You need to make sure that the connectors are connected correctly and in the right way:
(GND= Brown, +5V= Red, Signal= Orange)

Connection FlightCtrl V3.0



Connection FlightCtrl V2.x





To enlarge click on the image

Connected in that way and after the calibration of the Gyros the camera mount will be hold in balance automatically via the FlightCtrl.

2.2 Tilt control of the camera mount via the transmitter

If you want to set also the tilt of the camera mount via the transmitter you can do it with a potentiometer at your transmitter.
Here you can use every free channel at your transmitter.

In the following example channel 8 should be assigned to this function:

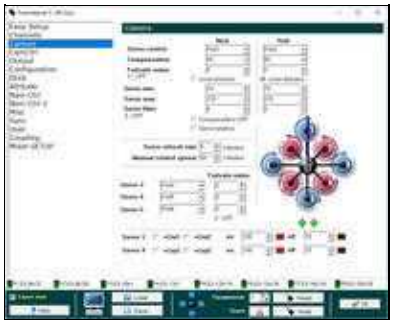
2.2.1 Step 1 - Assign Potentiometer at your transmitter

First at all you need to assign the channel 8 to a potentiometer at your transmitter.

A description of the assignment you will find in the instruction manual of the transmitter.

2.2.2 Step 2 - Assign Switch Output

So that the camera mount reacts to that channel you need to assign channel 8 (in this example channel 8 is on "POTI1") to the Nick-Output of the camera mount :



After saving that setting you are able now to tilt the camera mount additional and manually with the potentiometer at your transmitter.
(INFO: the servo outputs are only active after activating the copter (throttle up + yaw left))

If the camera mount is now moving into the wrong direction while moving the Kopter you should set the checkmark at "invert direction".

HINT
So that the camera mount is straight under the Kopter after the calibration of the gyros you can adjust the value "Servo control" for Roll manually.
Alternatively you can also use a potentiometer at your transmitter. Here you need to assign an additional free channel to a second potentiometer at the transmitter.
That channel (POTI) will be entered under Roll.

INFO

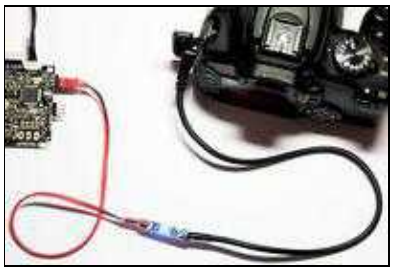
If you want to control the camera mount via a second transmitter you can do it i.e. with the function TrainerMode (teacher/student).
A description with examples you can find here: Trainer Mode

3 Examples for connections - Trigger camera

The additional PCB (ShutterCable or Extension-PCB) will be connected between the FlightCtrl and the camera.
On the FlightCtrl there are two switch outputs available. For the camera you use the input of the remote controlchinch.
With the ShutterCable is already a 3.5mm jack included which can be used with the most of the cameras.

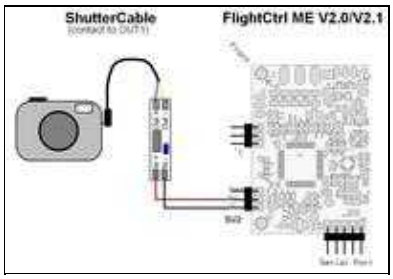
Hint
If you use a camera with an other jack you can solder also a suitable connection cable to the ShutterCable or to the Extension-PCB.

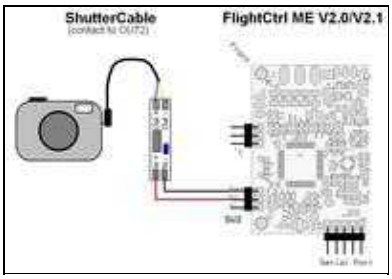
The connection could look in that way:


(Example view with the Shuttercable)

3.1 Connection example ShutterCable

The ShutterCable can be connected to output 1 or output 2 of the FlightCtrl (SV2):

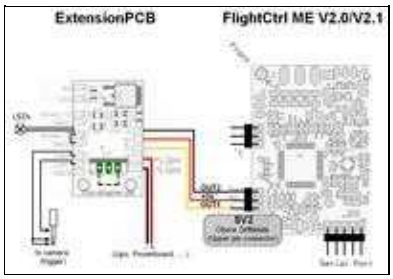




(To enlarge click on the image)

3.2 Connection example Extension-PCB

The Extension-PCB will be also connected directly to the switch outputs (SV2) of the FlightCtrl. Via the Extension-PCB you can use both switch outputs to the same time.
Here you have the opportunity i.e. to use one output to trigger the camera and the other output to switch the lighting.
Here now an example for the connection:



(To enlarge please click on the image)

4 Trigger camera with a button

So that you can trigger the camera with one of the examples described above you need to set an appropriate channel.
Here you can use each free channel on your transmitter.

In the following example channel 12 should be assigned to that function:

4.1 Step 1 - Assign button at the transmitter

First at all you need to assign a button at the transmitter for that channel. A description for assigning channels you will find in the instruction manual of the transmitter.

Assign button at the transmitter to channel 12:



(Example image)

4.2 Step 2 - Check function in the KopterTool

In the KopterTool you can check under "Settings" and under the tab "Channels" the function of the button.
If you do not push the button the appropriate bar (here channel 12) is down below. If you push the button the bar is up:

On the left side you can see that channel 12 is assigned to the function **"POTI8"**. This "POTI8" will be used for later assignments:

4.3 Step 3 - Assign switch output

So that the switch output switches while pushing the button and triggers the camera where the Shuttercable (or the Extension-PCB) is connected "POTI8" (channel 12) will be assigned to that output.
The set up will be done in the "Settings" under the tab "Outputs".

Under "Bitmask" you need to activate only the first box and the others will be still deactivated. Here the switch output "OFF" is only with a pushed button "ON".

In addition the low-voltage warning for that output will be deactivated.
If you leave the low-voltage warning for that output active the output from the battery warning would be continuously activated and triggers the camera unintentionally.

5 Trigger camera continuously after starting the motors

If you want to trigger the camera automatically and continuously during a flight you can do that pretty easy.
To that output (in this example output 1) which triggers the camrea with the ShutterCable or Extension-PCB a fixed time value will be assigned.
In addition you need to set the desired switch sequence via the box under the tab "Bitmask".

5.1 Example 1 - Camera set to single image recording

In this example the camera is set to **Single image recording** and should take a photo in specific time intervals.
After starting the motors the switch output should be closed every 2 seconds to trigger the camera.

For that you need to set a s follows:

- Output1 Timing: 100
- Output1 Bitmask: ON, OFF, ON, OFF,.....
- "only active after starting the motors" = Activated
- Green box behind the Bitmask = OFF

Throughout the number 100 each box has a switch period of 1 second (100x10ms = 1sec.).
Is a box under "Bitmask" "ON" the output will be switched on for the entered time. Is a box "OFF" the output will be off for that time.
If you checkmark under "only active after starting the motors" you can determine with the appearing green box behind "Bitmask" wether the function should be done with a running or a not running motor.
Here we leave the box off so that the function is active with a running motor.

You can enter also different time values under "Timing" and switch the boxes under "Bitmask" ON/OFF in any order.

Here some examples with different times:

Out1 Bitmask:	Click to change sequence:			Beispiel 2 (example 2)				
Bitmask =	ON	OFF	ON	OFF	ON	OFF	ON	OFF
Timing = 50	0,5sek on	0,5sek off	0,5sek on	0,5sek off	0,5sek on	0,5sek off	0,5sek on	0,5sek off
Timing = 100	1sek on	1sek off	1sek on	1sek off	1sek on	1sek off	1sek on	1sek off
Timing =	2sek	2sek	2sek	2sek	2sek	2sek	2sek	2sek

200	on	off	on	off	on	off	on	off
Out1 is:	ON ->	OFF ->	ON ->	OFF ->	ON ->	OFF ->	ON ->	OFF



5.2 Example 2 - Camera set to Continuous Shootings

In this example the camera is set to **Continuous Shooting** and takes images as long as the motors are on. Here it is necessary that the output is continuously switched on during the complete flight time. That should be active after starting the motors.

For that we need to set as follows:

- Output1 Timing: 100 (other numbers are also possible)
- Output1 Bitmask: All boxes ON
- "only active after starting the motors" = Activated
- Green box behind the Bitmask = OFF

In this case it doesn't matter what number is entered under "Timing". For that reason that all boxes are on this "Funktion" will be done continuously and also the output is continuously switched on.
So that "only active after starting the motors" is activated the switching operation will be started while starting the motors and been stopped while switching the motors off.

6 Trigger automatically via the WayPoint-Event

Alternatively to trigger via a button/switch at your transmitter you have the opportunity to trigger the camrea via the WayPoint-Event (WP-Event).
The WP-Event will be used for the WayPoint-Flight. Here you can trigger the camera individually and automatically for each WayPoint.

To use this function you should activate the function "combine with WP-Event":

(Example how to use POTI8)

A description of the WayPoint-Event you can find here: WaypointEvent

7 Align Camera

The camera can be adjusted either way manually via a potentiometer (see *"Tilt control of the camera mount via the transmitter"*)
or automatically during the WayPoint-Flight.

For the automatic tilt of the camera mount you can assign degree numbers for the tilt and for each WayPoint (see en/MikroKopterTool-OSD#WayPoints_-_Defaults).
The 0°-Position of the camera you can determine by yourself. The set up will be done before starting the Kopter through the view direction of the camera before the start.

Before starting the camera should be aligned straight.

If the camera should tilt by 90° downwards for this WayPoint-Flight those 90° will be counted to the 0°-Offset:

If you let the camera point a little bit upwards before the start is that direction the 0°-Offset:

If the camera points a little bit downwards before the start is that direction the 0°-Offset.