

QC Cam Power Adapter



User's Guide

Version 1.2

The QC Cam Power Adapter (QCCP) serves as a long-term power supply for cameras e.g. when used to record a time lapse. For this purpose, the Quick Charge technology of Power Banks is used, which allows higher voltages than the usual 5V to be drawn from a Power Bank. To use the QCCP you need a power bank that meets the QC2.0 or 3.0 standard and a battery dummy suitable for the respective camera. This battery dummy should be equipped with a DC socket for a 5.5x2.1 mm plug.

Which power bank is the right one for this use

From Qualcomm Standard Quick Charge 2.0, voltages of 9 and 12V are possible at the USB port. Sometimes even up to 20V. The power is limited to 18W. This means that at a voltage of 9V a current of 2A is available. Power banks based on the Quick Charge 3.0 standard also offer the option of setting a voltage between 5V and 12V in 0.2V steps and are backwards compatible with QC2.0.

Power banks with 18W.

Many of the PBs on offer have a maximum output of 18W and often have 2 QC3.0 USB ports. This is a little confusing, because if a voltage of 9 is requested at a USB port, the maximum power ($9V \times 2A = 18W$) of the PB can be obtained from it. These PBs can supply a camera with 8.2 / 9V.

Power banks with 35W and more.

In the case of PBs with higher power, 8.2 / 9V or even 12V can be provided at 2 USB ports at the same time. All PBs have at least one, some also 2 USB-A sockets with QC3.0 and additionally at least one USB-C socket. The USB-C sockets often also offer the Power Delivery (PD) standard. There are also PB which only offer PD and no QC on the USB-C port. Some of them are marked with PD but are still QC compatible.

Single or dual mode?

A very practical application would be to operate the camera on a QC port and to connect a lens heater to a 5V USB socket in parallel on a 2nd port. This is only possible with PBs with higher power. PBs with 18W can only be used for single mode. PBs with higher power can supply a camera with 8.2 / 9V and a lens heater in parallel (dual mode). Some PBs are even able to supply a camera with 9V and a slider with 12V at the same time.

QCCP function:

If the QCCP adapter is connected to a QC2.0 or 3.0 power bank, it requests a voltage of 8.2V from the QC PB via the QC3.0 standard after switching on. If the requested voltage cannot be set (PB is not suitable for QC3.0), an attempt is made to set a voltage of 9V according to the QC2.0 standard. The voltage to the camera is only switched on when the PB supplies this voltage. In order to prevent the PB from being switched off when the current is low, a software guardian simulates a permanently connected consumer by generating a current pulse every 5 seconds. But there are also PBs which need a permanent current in order not to switch off. In addition, the required current strength varies greatly in some cases.

An LED signals the status of the adapter:

LED	Status
flashing slowly	initialization 8,2V or 12V (QC3.0)
flashing faster	initialization 9V (QC 2.0)
flashing quickly	Error, voltage could not be set
permanently on	8,2 or 12V set
5 sec on 1 sec off	9V was set (QC2.0 PB)

In the event of an error, the QCCP constantly tries to initialize the PB until the required voltage is available.

Q QCCP configuration:

By default, the adapter is set so that after 3-4 seconds a voltage of 8.2V is available and the Guardian generates a current pulse every 5 seconds. However, this configuration is not sufficient for all PBs.

The QCCP is equipped with switches to meet the various requirements of the PBs.

For configuration, the housing must be opened by pressing on the lower housing shell and then removing the cover.

Switch 12V OFF: 8.2 or 9V

ON: 12V

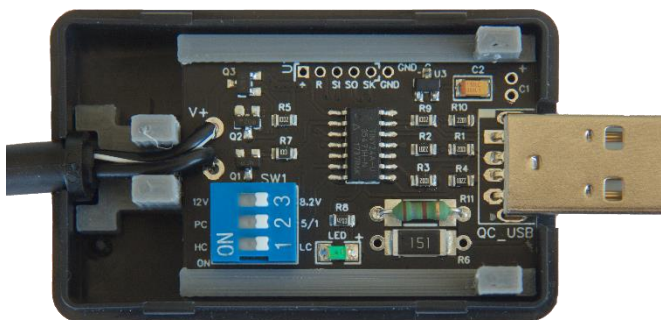
Switch PC OFF: current pulse off for 5 seconds, on for 1 second.

ON: continuous current




Switch HC OFF: low current

ON: high current

The following configurations are possible:

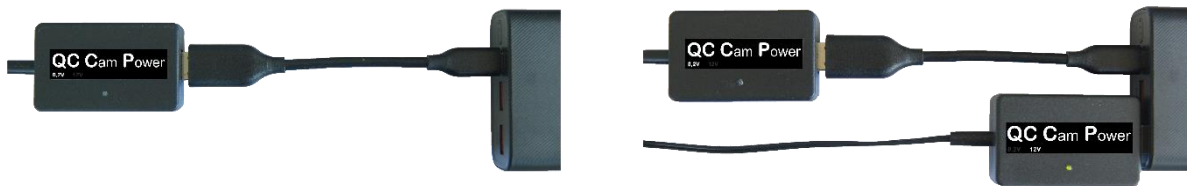


Konfiguration	Schalter 12V	Schalter PC	Schalter HC	Anwendung	Power Bank
1	OFF	OFF	OFF	Camera 8,2/9V	Current 40mA 5/1 Sek.
2	OFF	ON	OFF	Camera 8,2/9V	Perm. Current 40mA
3	OFF	OFF	ON	Camera 8,2/9V	Current 90mA 5/1 Sek.
4	OFF	ON	ON	Camera 8,2/9V	Perm. Current 90mA
5	ON	OFF	OFF	Slider 12V	Current 55mA 5/1 Sek.

6		ON	ON	OFF	Slider 12V	Perm. Current 55 mA
7		ON	OFF	ON	Slider 12V	Current 120mA 5/1 Sek.
8		ON	ON	ON	Slider 12V	Perm. Current 120mA

Connection of the QCCP adapter to the USB C port

The QCCP adapter is equipped with a USB A connector. A normal USB OTG adapter can be used to connect to a USB C port. This has the additional advantage that the QCCP is not connected directly to the PB, since the ports are sometimes arranged very close to one another.



But be careful with such OTG adapters:



These work, but !! This can also be inserted into the connector rotated by 180 ° and thus creates an absolute short circuit!

How can you test which configuration is required for your own PB:

First of all, the PB must at least meet the QC2.0 standard. QC3.0 is better.

Configuration for a camera (8.2 / 9V):

After connecting the QCCP adapter (only the adapter without camera) with configuration 1, the PB should switch on and after 3 seconds the LED should light up continuously. This means that 8.2V are already available. Then wait 1 minute and watch whether the LED on the adapter stays on or goes off after a while, which means that the PB needs either a higher or a continuous current. To do this, increase the configuration step by step (1-4) and check whether the LED remains on.

If a PB with QC2.0 is used, it takes approx. 6 seconds until the LED lights up continuously and the voltage is then set to 9v.

Configuration for a slider (12V):

Motor controllers for sliders do not switch to standby mode like cameras. To configure the QCCP, first set it to configuration 5, connect the motor controller to the QCCP and then connect it to the PB. After the QCCP delivers 12V, the motor controller also switches on.

After connecting the QCCP adapter with configuration 5, the PB should switch on and after 3 seconds the LED should light up continuously. This means that 12V is already available. Then wait 1 minute and watch whether the LED on the adapter stays on or goes out after a while, which means that the PB needs either a higher or a continuous current. To do this, increase the configuration step by step (4-8) and check whether the LED remains on.

One device with 2 different voltages:

The QCCP adapter can be set either to 8.2V for the camera or to 12V for the supply of a slider using a jumper. The configuration of the jumper cannot be seen from the outside. If 2 QCCP with different voltages are used for an application, there is a possibility to display the set voltage.

Both voltages are indicated on the label of the QCCP:



To mark which voltage is set, the text of the voltage not used is overwritten with a felt pen.



Connection of the QCCP to the battery dummy:



The QCCP is equipped with a DC plug 5.5x2.1mm for connection to the battery dummy. Many battery dummies are equipped with the appropriate counterpart (socket 5.5x2.1mm). But there are also dummies with the same connector as the QCCP. In this case you need this adapter:

<https://www.reichelt.de/dc-buchse-5-50-x-2-10-mm-dc-buchse-5-50-x-2-10-mm--goobay-76751-212982.html?ACTION=3&GROUPID=9001&ARTICLE=212982&START=0&OFFSET=16&>



Other dummies have a socket with 4.0x1.7mm, for which you need this adapter:

<https://www.amazon.de/Stecker-Adapter-auf-Hohlstecker-gerade/dp/B00JZH4YB0>



The information about which plug / socket is installed on the dummy can be found in the description of the dummy. If you are not sure, or if you have several dummies, such an adapter set can help:

https://www.amazon.de/Universal-Netzteil-adapter-5-5x2-1mm-Notebooks/dp/B01KBYJEBK/ref=pd_lpo_23_t_1/261-5559215-9239855?encoding=UTF8&pd_rd_i=B01KBYJEBK&pd_rd_r=8feeff0d-7c22-4001-9226-1231b5a975fb&pd_rd_w=4tOqj&pd_rd_wg=Qxr5r&pf_rd_p=d5c9797d-0238-4119-b220-af4cc3420918&pf_rd_r=SNB6REZRP0Q3PF5EJR60&pvc=1&refRID=SNB6REZRP0Q3PF5EJR60

specification:

Input voltage 5-12V USB-A
Output voltage 8.2 / 9 / 12V DC plug 5.5x2.1mm
Output current 8.2 / 9V 2A 12V 1.5A max
Dimensions 60x37x17mm (LxWXH)