

FAQ's USB+AA Solar Charger

Problems charging the AA batteries

I charged the USB+AA until the light came on solid. Then when I brought it indoors, the device said it was still charging. Are the batteries fully charged?

In short, yes your batteries are charged. Here is why the device may think that it is still charging;

The USB+AA monitors the voltage on the batteries and when the batteries reach a certain voltage it is assumed that they are charged. In full sun, the batteries are charged at 400mA, bringing the battery voltage higher as it charges. When the charger is then taken out of the sun and not being charged anymore, the battery voltage drops slightly. This is normal for battery charging. PowerFilm solar panels work so well in low light (indoors) that it is still able to provide small amounts of power indoors. This small amount of current trickle charges the batteries even when indoors, making the charger indicate that the batteries are charging.

When the solid light is illuminated on the charger, and the batteries are mostly charged, the charger limits the charging current to a trickle charge to fully top off the batteries. The solid light indicates that the batteries are charged enough to sufficiently supply power through the USB port. The solid light does NOT mean that batteries are %100 charged. Instead, it indicates approximately 70-80% charge depending on the age of the batteries. If you want to charge every last electron into the batteries, PowerFilm recommends leaving the charger out for at least 1-2 additional hours after the solid light has come on to assure that the batteries are as charged as they can be.

Can I charge my phone/mp3/GPS while I am charging the batteries?

Yes, although PowerFilm recommends starting with full batteries to improve operation. Always wait until the batteries have been charged to at least 50% before plugging in your device to charge. Modern electronic devices often need more power to charge than can be provided directly by the solar panel.

Problems using the USB output

I plugged in my USB device and it is not charging. What do I do?

Ensure that the batteries are fully charged by doing the following;

- If charging by solar, expose the charger to sun and wait for the solid charging light to show that the batteries are charged. You may want to leave the charger exposed for another 1-2 hours after the solid light has come on to ensure a 100% charge.
- Use an external AA battery charger that can be used to recharge NiMH or NiCd to fully charge the batteries.

Place the charged batteries into the holder with the correct polarity and make sure they are making good contact. Plug in the USB cable to the USB port on the charger with the other end connected to your device.

Your device should indicate that it is charging. If not, check with your device manufacturer to see if they require only the use of their specified chargers. The USB+AA may not be compatible with a very limited number of devices that require manufacturer specific chargers.

Note: the USB+AA is compatible with all Apple products and most cell phone manufacturers that require factory specific chargers.

If the USB+AA is not compatible with your device and you would like to return it, please return to your supplier with an explanation of which device the USB+AA was not able to charge.

The USB+AA was charging my device, but now the device switches between charging & NOT charging in approximately one second intervals....Is it charging?

This usually means that the AA batteries are discharged and need to be recharged before using the USB output. Disconnect your device and charge the AA batteries.

Most likely this switching is due to the fact that your device does not follow USB standard specifications. Our charger is designed to deliver 500mA @ 5V. Some devices require more current (especially smart phones like the Motorola Droid) outside of the USB specification. The USB+AA is able to deliver the higher current, however this discharges the batteries faster and causes an odd behavior in the AA battery voltage, causing the switching.

I tried to charge my iPad with the USB+AA, but the iPad says it is not charging.

Don't worry, your iPad is actually charging. Because the iPad requires a large amount of current to charge, it does not think it is charging using a 500mA USB port when it actually is. Use a set of full AA batteries and let your iPad charge. In just a few minutes you will be able to see your battery percent rising.

USB+AA's with serial numbers above USB-002000 will be able to charge an iPad. Previous models may or may not be able to charge the iPad as these models have not been tested since the iPad's release. Any USB+AA purchased through our Amazon.com store after 8/13/10 will be able to charge the iPad.

Because of the large battery in the iPad, one set of AA batteries will not provide a large amount of charge for the device. PowerFilm recommends using our 10 watt foldable charger (F15-600) with the RA-2 female cigarette lighter adapter included with it. Using an Apple approved car charger, you can plug into the 12 Volt cigarette lighter adapter and charge your iPad.

I am a Motorola Droid/2/X user, when will I be able to use the USB+AA to charge my phone?

The Motorola Droid does not follow USB 2.0 specifications and attempts to charge at currents far above specification. This causes the switching behavior described in the charging/NOT charging FAQ. PowerFilm's Engineers have redesigned the USB+AA into a new product, the USB+AA V2.0. This device contains limiting circuitry to assure that even devices that do not follow USB 2.0 specification will charge using the USB port. Most retailers should be receiving USB+AA V2.0s Summer 2011. Check with your supplier to see if they have new units in stock

For an alternative solution, Motorola Droid users can use a 5 or 10 Watt foldable or a rollable panel with the RA-2 female cigarette lighter adapter. A Motorola Droid car charger can then be used to charge the phone using the solar panel. The USB+AA only has 1.5 Watts of solar, therefore if you would like to charge your Droid faster, PowerFilm suggests using a 5 or 10 Watt foldable, or a 7 watt rollable.

Will the USB+AA charge my mp3 player or cell phone?

The USB+AA is compatible with the majority of major mp3 players, GPS devices and cell phones. Some devices, especially older devices not designed to charge using USB, are not compatible with the USB+AA because they require a manufacturer specific charger. Currently the only proven cell phone incompatibility is with the Motorola manufactured Droid/Droid 2/Droid X/R2D2. USB+AAs purchased from Amazon.com before 8/13/10 may not be able to charge the iPod Classic.

I plugged in my phone/mp3 to the USB, left it to charge. When I came back, the device was more discharged then when I started!?! What happened??

If the AA batteries were fully charged then most likely your phone/mp3 player is not compatible with the USB+AA.

On some phones and mp3 players, the USB+AA will enable the charging circuit on your device. However, because it is not a manufacturer specific charger, the device will not charge. The charging circuit being enabled will then consume the power of the device and leave it less charged than it was before.

If the batteries were discharged, they may have been able to provide the 5V for the USB, but were not able to provide the current needed to charge. This may cause the same results as described in the previous paragraph.

Is the PowerFilm USB+AA Solar Charger compatible with the iPhone 4/3G/3Gs/iPod/iPod touch?

Yes, the USB+AA is compatible with all of these devices. If you are having problems charging these devices with the USB+AA, first require the USB+AA FAQ located on our website. If this does not answer/solve you problems please contact PowerFilm's product development team through our online contact process.

I plugged in my dead iPhone and left it to charge and it only charged up to 50%. The iPhone has a 5.25Wh battery and the AA batteries are 4.8Wh. Shouldn't it charge the iPhone to 80-90%?

What you are experiencing comes from a number of non-idealities of batteries and charging. One of the major drawbacks to batteries (in this case NiMH) are that the higher they are loaded (i.e. more current they have to push) the less efficient the batteries are operating. The batteries are technically rated at 1.2 Volts, 2000mAh at a 200mA draw...this means if the batteries are discharged at 200mA per hour they should be able to supply 2000mAh. To charge your phone at 5V, 500mA...the AA batteries need to supply twice as much current at rated voltage (1 Amp). What actually happens is the battery is then loaded heavily dropping the voltage further, and real life tests show approximately 1.2-1.3 Amps coming out of the AA batteries to charge an iPhone. AA batteries are designed to work in small electronics that usually sip on power. This being the case, just from the amount of power being drawn, the batteries will lose as much as 10-20% of their capacity. Also, the batteries are disconnected when they dip below 20% of their capacity to save their cycle lifetime and allow the batteries to be used hundreds of times rather than tens of times. Then throw in the inefficiencies of the boost converter (2.4V -> 5V) which is about 88-89% + series inefficiency of iPhone's internal charger (probably about 95%). Now for some math -> $0.8 * .88 * .95 = \sim 67\%$ This means that 67% of the power leaving the batteries actually makes it to the iPhone's battery. When you add in the calculations from the top, it comes out to being able to charge the iPhone up to 57%. In testing here at PowerFilm the iPhone charged between 50-60%. One other thing to note is our LED on the USB+AA goes solid when the batteries are about 80% charged. This is more of an indication that the batteries are ready to use, not necessarily 100% charged. To get 100% charge, you should always leave the charger out for another hour or so to make sure the batteries are fully charged.

Unfortunately, there are a lot of factors against us on the efficiency side of things. We are constantly working towards improving the USB+AA, looking for better batteries and improving the efficiency of the boost converter.