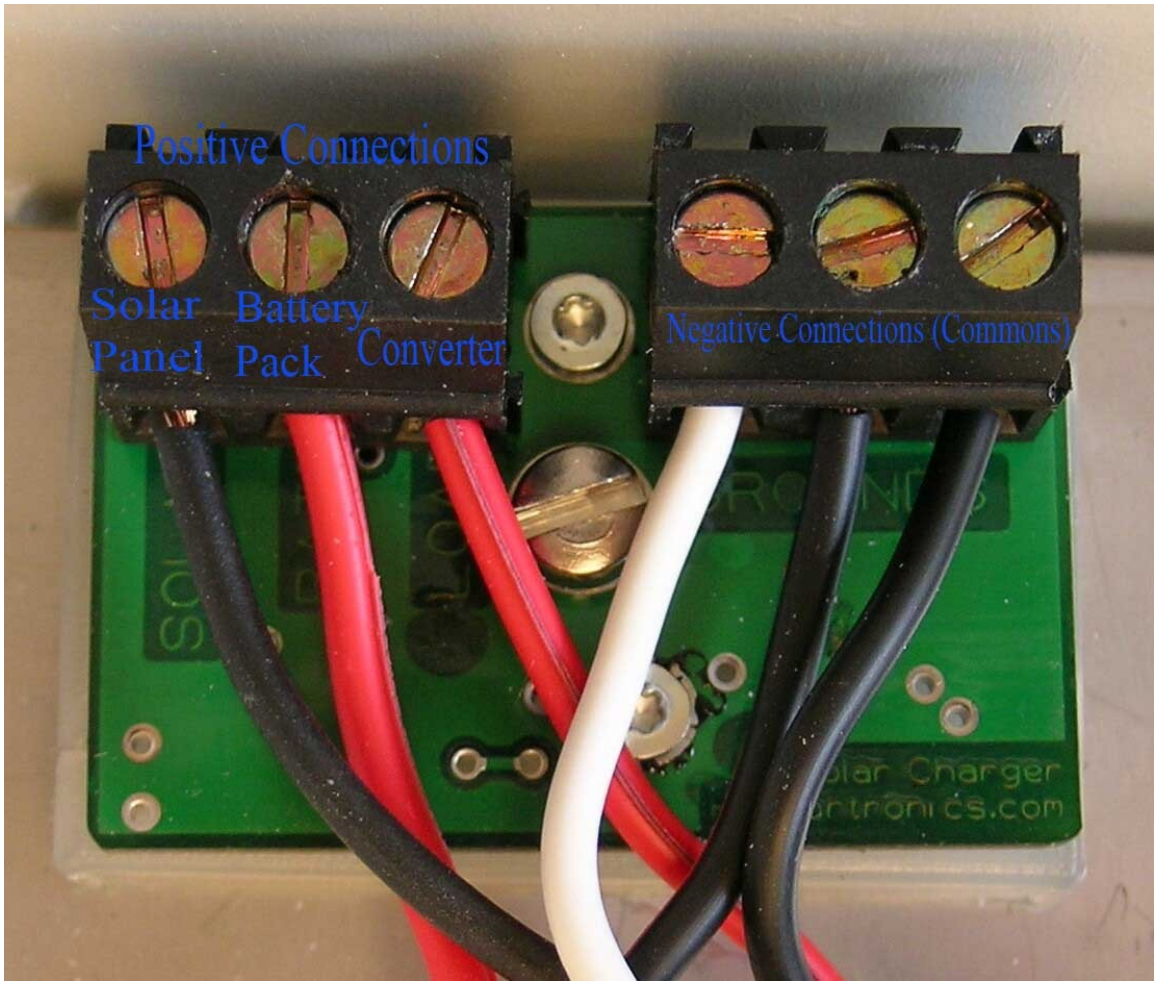
Harbortronics Time-Lapse Package
Troubleshooting Guide

This document is intended to help diagnose any problems with your Time-Lapse Package.

Power

Everything in the Time-Lapse Package (TLP) is powered by the large Lithium-Ion Polymer battery pack, made specifically for Harbortronics. It should last for a number of years in normal use before it's capacity degrades significantly. The battery pack is large enough to power the system for a month or more without any sunlight, depending of course on the number of pictures taken per day.

The battery pack is charged as needed by the solar panel, and the associated 'Solar Charger' circuitry. When the battery voltage drops to roughly 11.1V, the solar panel is 'connected' to the battery pack, until the battery voltage rises to about 12.1V.



The terminal blocks on the Solar Charger circuit provide connections for the battery pack, the solar panel, and then to the battery converter. Note that each of the three screws on the right side are connected together, and are the 'ground' connections. Each of the

screws on the left side should be positive with respect to the terminal block screws on the right. The battery pack and battery converter are connected together on this circuit board. The wires to the solar panel connector may be different colors... on older models, the colors are as shown, but on newer models, there will be red and black wires, with the red being the positive lead, connected to the left most screw.

Battery Pack

You can test the battery voltage by touching DC Voltmeter probes to the screws on the Solar Charger circuit. The battery pack is connected to the center screw on the two terminal blocks.

Battery Pack Voltage Range:

- 0 volts: The protection circuits within the battery pack may have disconnected the battery. It may be discharged too low, or too much current may have been drawn. Try charging it again using the supplied AC charger.
- 10 – 11 volts : The battery pack is not charged… the circuits may shut down soon. There may not be enough sunlight to keep the battery charged, or too much power is being drawn.
- 11.1 and 12.1 volts: The battery pack, solar charger, and the solar panel all seem to be working correctly.
- 12.1 and 12.6 volts: The battery appears to be freshly charged using an external battery charger. If this isn't the case, the solar charger circuit may be faulty.

Solar Panel

You can test the solar panel by touching DC Voltmeter probes to the screws on the Solar Charger circuit. The solar panel is connected to the left screw on the two terminal blocks. Note that on some solar panels, the white lead is positive and black lead is negative. On other solar panels, the positive is red, and negative black.

Solar Panel Voltage Range:

- 0 volts: The solar panel is receiving no light, or it may have failed.
- > 13 volts: The solar panel seems fine… the battery may be sufficiently charged, and is not drawing current from the solar panel.
- Equal to the Battery Pack voltage: The solar panel is working fine, and is presently charging the battery pack.
- Less than the Battery Pack voltage: There isn't sufficient light on the solar panel to charge the battery pack.

Battery Converter

The battery converter is connected to the battery pack through the solar charger circuit. As long as the battery pack has 10 volts or more, the battery converter should be able to power the camera, and the DigiSnap controller.

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There is a fuse located on the battery converter circuit board. This fuse should only 'blow' if the power is connected backwards. It has a rather tiny filament, but you can see it if you hold it up to the light. If the fuse is blown, please check everything very carefully before replacing the fuse! As a last resort, if you know the connections are OK, you might be able to bypass the fuse by inserting some wire in the fuse socket, until you are able to replace the fuse. There may be a spare fused taped to the panel, next to the circuit board.

If you have the first generation Time-Lapse Package, recognized by having a large rectangular housing, the Battery Converter is a circuit attached to a black heat sink. On the later Time-Lapse Packages, the Battery Converter is mounted on the back of the aluminum panel. If you need access to it, you will have to remove the panel.

The 4 pin connector is the output of the battery converter. This splits to two cables which are used to power the camera and the DigiSnap controller. The right-angle connector with the yellow tip is connected to the camera, and the straight connector with the black tip goes to the DigiSnap. These connectors can be used to check the battery converter operation, by using a DC voltmeter. The center pin on both connectors is positive. You may need to use a small piece of wire (paper clip?) to make connection with the center pin on the camera connection, as it has a very small center hole.

The DigiSnap connection should have a voltage in the range of 4.7 to 5.2 volts. The camera connection should be 6.3 to 6.7 volts for a Pentax K110/K100 camera, or roughly 8V-9V for a most other cameras.

There may be another cable attached in-line with the camera cable, which then plugs into the battery compartment of the camera. The contacts on the dummy battery are very hard to probe, as they are recessed. If you need to verify power on these contacts, you may have to find some fine wire to stick into the slots.

One the latest Time-Lapse Package design, using the DigiSnap 2700, there is another connection made to the Battery Converter. There is a yellow/orange wire pair soldered to the board, which mates with the DigiSnap 2700 via a 4 pin square connector. The DigiSnap may short the yellow/orange wires together to shut the camera power off. If you are having problems with power to the camera, disconnect the 4 pin connector, which should ensure that the Battery Converter is enabled.

Camera

A few things should be considered when setting up the SLR camera.

The lens should be switched to manual focus, as auto-focus can sometimes take too long (the picture might not be taken), or the camera could focus on say, a fly on the glass window! Most applications will have the lens set to infinite focus, wide angle. You might consider using gaffer/electrical/duct tape to keep the lens rings from rotating after you've adjusted them.

The camera's internal flash should never be used inside the housing. As long as you don't use the Auto setting on the dial, this should not be an issue. We normally suggest using the "P" program mode on the camera.

Set the camera's 'auto-off' menu item to 30 seconds or 1 minute (as short a time as your camera will allow to minimize power draw. The DigiSnap will wake the camera as it needs to take the pictures.

Set the image review to off, to save power. Also, disable any other feature that turns the LCD on.

DigiSnap Controller

The DigiSnap controller has a number of configuration possibilities, and this is an obvious source of potential confusion. Earlier models of the Time-Lapse Package used the DigiSnap 2100 controller, and newer ones are using the DigiSnap 2700. All the DigiSnap 2000 series controllers have the DigiSnap 2000 logo, but you can determine the model through physical differences. The DigiSnap 2100 uses only a 9 pin serial connector, with a cable coming out the side with a jack for power. The DigiSnap 2700 has the 9 pin connector, and 3 other connectors on the other end.

DigiSnap 2100

Several versions of DigiSnap 2100 firmware have been used in production in the TLP. The firmware was recently changed to simplify the menus and configuration changes between camera types. The configuration settings below are appropriate for all SLR cameras using manual focus. Please forgive the shorthand notation for the DigiSnap Settings… once you have the DigiSnap connected to a terminal, and play with it some, this notation will become clear. Refer to the DigiSnap 2000 series manual or the DigiSnap 2700 manual for more details!

DigiSnap 2100, Firmware Version 3.11

Main Menu
- Camera Interface : Non-Serial

Special Features Menu:
- External Output
  - Enabled
  - Enabled
  - Enabled
  - Normal
  - 2 sec
  - 0 sec
  - Active High

Switch Menu
- Switch 1 : Function G – Shut DigiSnap Off
- Switch 4 : Function G – Shut DigiSnap Off

DigiSnap 2100, Firmware Version 3.50-3.70

Main Menu
- Camera Interface
  - SLR
  - 2 Seconds

(Much simpler!)

The vast majority of applications are for monitoring daily changes on construction sites, environmental sites, etc., and a daily sequence of pictures is generally used.

The major complication when setting up Advanced Time-Lapse (ATL) settings is knowing the time-of-day. When using a serial interface camera (i.e. Coolpix), the DigiSnap requests the time of day from the camera. SLR camera interfaces do not support such exchanges, so the DigiSnap simply presumes that it is midnight (00:00) when it is initially powered on. Therefore, when using the DigiSnap in ATL with an SLR camera, the starting time for the sequence of pictures must be entered as a time relative to when the DigiSnap is powered on. If the sequence should be started immediately, set the

start time to 0 hours, 1 minute. This will allow the DigiSnap time to initialize, and start the sequence one minute later.

For instance… an application requires one picture per hour, from 8 am to 5 pm. The installer will be on site at 3 PM a few days before the project begins (in order to get a few days of testing time). 8 AM is 17 hours after 3 PM, so the starting time is set to 17 hours, 0 minutes. The number of pictures is set to 10, and the interval set to 1 hour, 0 minutes, 0 seconds. The DigiSnap is powered on at 3 PM, and the following morning, the camera takes the first picture at 8 AM.

Main Menu:
Operating Mode : ATL

ALT Menu:
Sequence 1
Enable
Start Hour 17
Start Minute 0
Number of Pictures 10
Interval Hrs 1
Interval Mins 0
Interval Secs 0

DigiSnap 2700

There were two new features added to the DigiSnap 2700.

1) Real Time Clock
   The old DigiSnap controllers did not know the time of day, which complicated setting up daily time-lapse sequences (Advanced Time-Lapse). The 2700 has a real time clock, allowingATL configuration on an absolute time basis.

   The clock time and date are set on the main menu.

2) Camera Power Control
   A few camera models do not go to a low power state between pictures (sleep). The 2700 has the ability to control the camera power, via connection to the Harbortronics Battery Converter. For the majority of camera models, we simply suggest leaving the power on all the time.