

DigiSnap 1000

Overview

The DigiSnap 1000 is an electronic shutter release compatible with many of the available digital cameras. The DigiSnap 1000 can be configured to take a single picture, or to take a series of pictures at precise time intervals (time lapse photography).

Items included:

- DigiSnap 1000
- AAA Battery, Alkaline (already installed)
- Cable Assembly, Null-Modem, DB9-F / DB9-F, 6 Ft
- Screwdriver, #1 Philips
- Users Guide

Background

The fundamental operation of a remote shutter release is to cause a camera to take a picture without having to physically touch the camera, minimizing movement when the shutter is open. Very few digital cameras provide for the mechanical connection of a classic cable release, so some individuals have crafted devices which attach to the camera body permitting use of a cable release. Another class of remote shutter release is that of a remoted switch, whereby the camera manufacturer provides an electrical connector, as well as a switch mechanism on a cable, to simulate the action of the camera switch remotely. The DigiSnap 1000 is an electronic shutter release, whereby the camera is commanded to take a picture using a command and response protocol over a serial communication link.

There are some fundamental differences in the operation of an electronic shutter release as opposed to a cable release (mechanical) or remoted switch (electrical). In most cases, the shutter release switch on a camera has three positions (off, half-pressed, and fully-pressed). When half-pressed, the camera may perform some preliminary operations (focus, etc.) in anticipation of the switch becoming fully pressed. An electronic release does not allow for this two step operation. When commanded electronically, the camera performs all required tasks at one time, as if the camera switch were fully pressed in one motion. Depending on the particular camera model, and firmware version, there may be other differences when using an electronic release as well. Another difference is that a electronic commands can be transmitted via a number of pathways (i.e. internet, phone lines, radio modems, etc.), without regard for physical distance, whereas a mechanical cable release is quite limited in distance.

The advent of the electronic release adds yet another twist, that of automated control. There are several programs available via the internet to control digital cameras through the use of a personal computer. The DigiSnap 1000, being a small battery powered device, eliminates the tie to a computer. The DigiSnap 1000 also provides time lapse image capture, future versions of the DigiSnap line may provide other automated functions as well.

Applications

Consider the following potential applications for the DigiSnap 1000 with a digital camera.

Minimize Vibration

- Studio photography - Camera on tripod.
- Macro Photography - Camera on tripod.
- Astrophotography - Camera mounted on telescope.

Time Lapse / Unattended

- Plant or flower movement - reaction to sunlight, etc.
- Animal feeding areas - watering holes
- Nature - light changes over the course of a day
- Astrophotography - movement of stars or other celestial bodies
- Human Activities - whimsical or artistic snapshots

Remote Operation

- Camera placed in hidden location, with operation from a distance.
- Camera on a pole or boom, extended into a hazardous or inaccessible location (i.e. a fuel tank or well), activated via a long serial cable.
- Camera in a remotely controlled helicopter, activated via serial commands through a radio modem.
- Multiple cameras installed at various remote locations, all commanded to take pictures at the same time, possibly via internet.
- Camera mounted near a birdfeeder, capturing close-up images of birds.

Connection to Camera

All cameras compatible with the DigiSnap 1000 are sold with a serial cable for connection to a personal computer (typically for picture download). The DigiSnap 1000 provides the same interface connector as a computer (DB-9 male), permitting the DigiSnap 1000 to be connected directly to the cable supplied with the camera.

Extending the cable

It is quite easy to operate the DigiSnap at distances much farther than that of the serial cable supplied by the camera manufacturer. The DB-9 serial interface is industry standard, permitting use of additional cables to extend the distance between the DigiSnap 1000 and the camera. All that is required is a DB-9 Male / Female cable, with straight through connections. These cables are commonly available in computer and electronics stores. For those wishing to make their own cables, only three wires are required, connecting pins 2, 3, and 5. The data rate of the DigiSnap is intentionally kept to 19.2 Kbaud, allowing the use of very long cables. The maximum distance is dependent on the particular camera model, and the quality of the cables used. The DigiSnap has been successfully tested with a 700 ft cable, with no suggestion of any problem.

Connection to Terminal

The DigiSnap 1000 can be connected to a computer or 'dumb terminal' to configure the time lapse settings. The terminal may be a personal computer running a terminal emulator program (such as HyperTerminal on a PC), or any other device operating as a simple terminal.

A null-modem cable is supplied with the DigiSnap 1000 to facilitate connection to a terminal or computer. The data rate is 19.2 Kbaud, and the RS-232 format is N-8-1 (no parity, 8 data bits, 1 stop bit).

Standard Operation :

Taking a single picture

The DigiSnap has a single pushbutton, which when pressed momentarily will communicate with a digital camera, commanding it to take a picture. If the button is held down continuously, additional pictures will be taken for as long as the button is pressed. The images captured are retained in the camera, exactly as if the camera were used normally.

Status Indicator (LED)

There is a two color LED on the top of the case, indicating the status of the operation. When the switch is first pressed, the LED will light both the red and green sections, making an orange or yellow color. Once the DigiSnap 1000 has established communication with the camera, the LED will turn off. After the picture has been taken, and stored to the memory in the camera, the LED will briefly flash green, to indicate success. If there was a problem, the LED will flash red. The number of times it flashes indicates the error it encountered.

# Flashes	Error	Note
1	Low Battery	The battery in the DigiSnap may need to be replaced
2	Timeout	There was a problem communicating with the camera, check the cables.
3	Internal	There may be an internal program glitch, or a hardware problem.
4	Response	The camera did not return the anticipated responses to the commands. There might be some problem with the camera or it may not be compatible.
5	Camera	The camera may be out of image memory.
6	Unknown	If this occurs regularly, contact Harbortronics.

If there is an error when taking a picture, the DigiSnap 1000 will make another two attempts before giving up completely. This becomes obvious when watching the LED, as it will go through the entire cycle three times before turning off completely.

Time Lapse Photography

The DigiSnap can be easily configured for time lapse photography, where the number of pictures, as well as the time between each picture can be controlled. When the DigiSnap 1000 is then connected to the camera, and the button pressed, it will take a picture, wait for the appropriate amount of time, and take another, repeating until the desired number of pictures have been taken.

While waiting between taking pictures, the DigiSnap will flash the green LED once every four seconds, to indicate that it is still operating normally.

If an error occurs when taking a picture during time lapse operation, the time lapse process will stop, and the DigiSnap 1000 will shut off. Note that the DigiSnap will record the number of pictures taken and the error encountered, which can be viewed later using a terminal.

Battery

The DigiSnap 1000 is shipped with a battery installed, to allow immediate use. The DigiSnap 1000 uses a single AAA size battery. Alkaline batteries are the preferred type, as they will yield the longest life under normal use.

The case must be disassembled to access the battery, which is easily removed and replaced by the user. The two screws on the bottom of the case must be removed to open the case, and a small Philips screwdriver is shipped with the DigiSnap 1000 to facilitate this operation. The battery polarity is indicated by a simple drawing on the circuit board. Installing the battery backwards will not damage the DigiSnap 1000, but the battery will be drained fairly quickly.

Service / Warranty

All Harbortronics products are warranted against any manufacturing defects for a period of one (1) year from the date of purchase. Defective products should be returned prepaid to Harbortronics. Harbortronics will at its discretion, repair or replace such products without charge, and will return to the customer prepaid. Except as mentioned above, no other warranty expressed or implied, applies to this Harbortronics product. All other claims, of any nature, including but not limited to camera damage are not covered. This warranty does not cover damage caused by misuse, accident, or abuse. This warranty does not cover consequential damages or other incidental damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusions may not apply to you. Contact Harbortronics at www.Harbortronics.com for service instructions

Revision date: 4-27-2000

Configuration

In order to configure the time lapse settings, as well as other functions, the DigiSnap 1000 is designed to communicate directly to a terminal (or terminal emulator).

Once the terminal is set up, and the cable connected between the DigiSnap 1000 and the terminal, pressing the button on the DigiSnap 1000 will display a menu of available commands. This menu is duplicated below. The green LED will also flash every four seconds to indicate that it is working normally.

```
***** www.Harbortronics.com *****
DigiSnap 1000, Firmware Version 1.0
Remote Shutter Release / Time Lapse Configuration
```

```
Current Settings
Number of Pictures to Take : 001
Time Between Pictures      Hours : 000
                           Minutes : 000
                           Seconds : 015
```

Commands (enter a single letter)

```
N - Change the Number of Pictures to Take
H - Change the Hours between Pictures
M - Change the Minutes between Pictures
S - Change the Seconds between Pictures
R - Reset to single Picture (No time lapse)
I - Set to Infinite Pictures (time lapse forever)
D - Display Serial Number of DigiSnap
L - Display Results of Last Time Lapse operation
Q - Quit (Shut DigiSnap off)
```

Note that the menu header displays the internet address of Harbortronics, as well as the firmware version number. At the end of the menu is the prompt character. To enter a command, the letter is entered (upper or lower case) followed by the return <CR> key. If the <CR> is entered without a command, the menu will be refreshed.

The number of pictures taken during the time lapse operation can be set using the “N” command. Note that if set to 1, a single picture will be taken, with minimum time delay (single shot).

The “H”, “M”, and “S” commands allow setting the time delay between taking repeated pictures, changing the Hours, Minutes, and Seconds, respectively. The maximum delay between pictures is 255 hours, 59 minutes, 59 seconds. The minimum delay can be set to 0 hours, 0 minutes, and 0 seconds, but this is impractical, as it typically takes a few seconds for the camera to take, and store an image. If the delay time is set shorter than the camera will support, the DigiSnap 1000 will command new pictures be taken as soon as the camera signals that the picture has been stored (will operate as fast as possible). Depending on the firmware in the particular camera used, an error might occur if operated in this way, causing the DigiSnap 1000 to abort the time lapse operation.

The “R” command is a shortcut to set the number of pictures to one, operating the DigiSnap as a single shot shutter release.

The “I” command sets the number of pictures to take to infinity. In this way, the DigiSnap 1000 will continue to take pictures at the configured time interval until an error occurs, such as the camera running out of memory.

The “D” command displays the serial number of the DigiSnap 1000. This is a unique number assigned at the factory.

(Configuration continued)

The “L” command can be used to determine the status of the last time lapse session. For instance if the last time the DigiSnap was used as a time lapse controller the camera ran out of memory, the DigiSnap would save and report the number of pictures actually taken, along with the error encountered. This may be particularly useful in tracking problems in long term time lapse setups.

The final command, “Q”, is used to disconnect from the DigiSnap 1000, saving the changes made during the session. If the Q command is not entered, the DigiSnap 1000 will automatically save any changes and shut off after 3 minutes, if no activity is detected.

Compatibility

The DigiSnap 1000 was developed to use a command protocol common to many of the digital cameras on the market. This protocol appears to be proprietary, but a partial public description of the protocol exists, per the work of Eugene Crosser. We offer our thanks to Eugene and all others who helped to document this protocol, permitting the development of the DigiSnap product line.

In order to ensure compatibility with the widest range of cameras, the DigiSnap 1000 makes use of the minimum number of commands possible to take a picture. The DigiSnap 1000 makes no attempt to use any special features of any camera, nor does it even recognize to what camera model it is attached. This means that the DigiSnap 1000 should be compatible with essentially all cameras which share this protocol, which includes multiple camera models from several different manufacturers. Please check the Harbortronics web site for an up-to date list of cameras that are believed and/or known to be compatible with the DigiSnap 1000.

Given that the electronic shutter release process is different than that of a switch press on the camera, there may be differences in the operation of a particular camera when operated using the DigiSnap 1000 and when operated manually. Given the multitude of cameras that support the protocol, it is impossible for Harbortronics to test each camera model of each manufacturer to isolate the idiosyncrasies of operation with the electronic shutter release. Some popular camera models may be tested however, whose results will then be posted on the Harbortronics web site.

The Harbortronics web site (www.Harbortronics.com) offers a public domain DOS program for download, which operates on PC compatible computers, allowing any digital camera user to test their camera with the same algorithms (single shot only) used in the DigiSnap 1000. If the camera is compatible with the PC software, it should work equally well with the DigiSnap 1000.