

INCA3 Quick Start Guide – Disk Operation

November 10, 2005

The INCA3 camera has three interfaces so you can choose the best one for the job. For off-line operation, pictures can be stored on a compact, high-capacity PCMCIA disk card. For on-line operation pictures can be sent via Ethernet using wired Ethernet or a wireless PCMCIA card. Generally the wired Ethernet connection is only used with a multiple-camera setup and so is described in the V-STARS/M operating manual. Typical wireless operation with a single camera is described in the INCA3 Quick Start Guide – Wireless Operation document.



This manual provides a brief overview for taking pictures with the INCA3 camera when using a disk card. Therefore, it describes only the most common situations. More detailed operating and troubleshooting instructions will be provided in the INCA3 Camera Manual when it is available.

This manual describes operation with INCA3 firmware version 04.08.02F and later. If you do not have this version or beyond, please download it from the GSI support web-site and install it in the camera.

Throughout this guide **NOTE:** indicates particularly useful information. **WARNING!** is used when special attention should be paid to the information provided or else damage may result.

Unpacking and Packing the Camera

The INCA3 camera case is designed to hold the camera with its accessories (viewfinder, battery, strobe, PCMCIA cards, etc.) attached to the camera. We generally recommend leaving these attached when packing the camera. It's faster, easier, more reliable, and they are less likely to get lost!



NOTE: Your case may vary somewhat due to your particular system configuration or improvements in our case design.

WARNING! It is best to leave the strobe attached to the camera. If it is necessary to remove or attach the strobe, make sure the camera power is off or else damage to the camera and/or strobe may occur.

Battery Usage

The camera uses a standard, unmodified Sony camcorder battery (Model NP-F750 or NP-770) so you can get additional batteries (and chargers) at virtually any electronic store in the world (or on the internet). We recommend you get extras because they are cheap and convenient. As of July 2005 the NP-F750 has been replaced by the NP-F770 which has 50% greater capacity. A larger Sony battery (Model NP-F960 or the new NP-F970) is available, however, they cannot be used with the large standard ring strobe (it will not fit). You can only use these larger batteries with the small ring strobe or a lamphood strobe. All these batteries use the same standard Sony battery charger (Model AC-V700) provided with the system. You can order batteries and chargers on-line at numerous locations.



The table lists the INCA3 compatible batteries and typical run times. Run times vary depending on how often you take pictures but these times are typical.

Part #	Run Time	Comment
NP-F750	60 min	No longer standard as of July 30, 2005
NP-F770	90 min	New, higher capacity substitute for NP-F750
NP-F960	120 min	Cannot use with large ring strobe
NP-F970	150 min	New, higher capacity substitute for NP-F960

WARNING! Batteries can be attached or removed with the power switched on but we recommend turning power off when doing this to avoid potentially damaging power surges.

Remove the battery by pulling it up at the bottom until it releases. There is a lip on the camera underneath the battery to protect the battery from accidental removal. Make sure you are not pulling up on this.

```
Ready/Done
Job 1, 2 frame(s)
Battery [##### ]
```

The camera displays the battery power level on the camera's LCD display. When the battery is low (typically one or two bars and 2-5 minutes of battery left), the camera will start to beep. When the battery is



critically low (typically no bars and only 1-2 minutes of battery left) the camera will beep more rapidly. When the battery is exhausted the camera will shut itself down to avoid damaging the camera or battery. In shutdown, the LCD will be blank but the LED on the top of the camera will be on. If the camera enters shutdown, it will take days for the LED to fully discharge the battery but you should turn the camera off when you can.

Taking Pictures Using a Disk Card

We recommend getting extra PCMCIA disk cards since they are cheap and convenient. Ordering information is provided below for the 512MB disk card we provide with the camera. A typical picture is under 1MB so a 512MB card can usually store over 500 pictures. Several other capacities and versions of cards are available but we have only extensively tested the 512MB Ultra II version. We have also used the 1GB Ultra II version and encountered no problems. However, we can only guarantee operation with the 512MB Ultra II cards that we provide with the camera.

Manufacturer Part #	Description
SDCFH-512-901	SanDisk Ultra II - 512 MB - CompactFlash Card

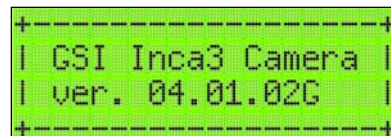
We do not expect problems with other capacities and versions of the SanDisk cards (if you have problems, please let us know so we can investigate and inform other customers). We recommend using the Ultra II or Ultra III version of any capacity card because they are faster than the non-Ultra cards or the earlier Ultra cards.

NOTE: In the INCA3 cameras, there is no speed difference between the Ultra II or Ultra III, but the Ultra IIIs are somewhat faster than the Ultra IIs when reading the pictures into a computer.

A list of suppliers can be found at: <http://www.sandisk.com/retail/buy.asp>

To use the INCA3 camera with a disk do the following:

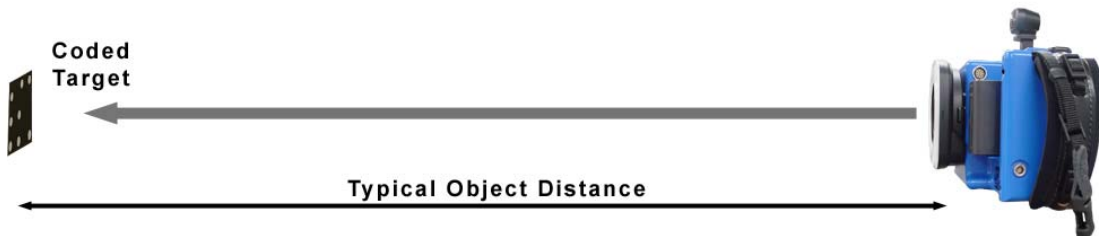
1. Remove the lens cap, and attach it to the holder provided on the bottom of the camera. If the lens cap is not in the holder, the LCD will display a warning error after the camera boots up but the camera will still take pictures.
2. Check the lens for dirt, smudges, dust, etc. If any are found, gently clean the lens with the lens cloth provided in the case. Do NOT clean the lens unless there is a problem - excessive cleaning can damage the lens.
3. If necessary, attach the viewfinder.
4. If necessary, attach the battery.
5. Turn the camera on. The power switch is a slide switch near the bottom of the camera. The camera status light (on top of the camera near the back) should immediately come on.
6. The camera will take about 45 seconds to boot up after which the camera's LCD display will come



on. It will display a screen similar to the one here showing the current firmware version for a few seconds. Then the LCD will display the camera status.

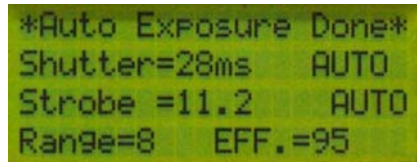
7. Set the strobe and shutter exposure. The default is to use the AutoExposure feature of the camera (this is indicated by the word "AUTO" appearing in the LCD display when the current shutter and strobe values are displayed). "AUTO" mode will take some test pictures at the beginning of a job and automatically set the strobe and shutter exposure. To use Auto Exposure, do the following:

- a. With the camera at a typical distance from the object, aim at a coded target so it is roughly perpendicular to the camera axis and roughly in the center of the camera field of view.



- b. Press and hold the Up mode switch and then press the Trigger switch and release both switches. The two mode switches are on the back of the camera. The higher one is the Up switch and the lower one is the Down switch. The Trigger switch is the large, black switch on the front of the camera – near the top. **NOTE:** Your camera may have two Trigger switches – one on each side or there may just be one.

- c. The camera will then quickly take a series of pictures and automatically choose the shutter time and strobe power level. The camera can be hand-held during this operation but it helps to keep it steady.



When done, the camera will beep and display the chosen values on the LCD. The LCD will also display the strobe's efficiency rating (EFF should be at least 90). The LCD will also show the expected background range given the exposure. The camera tries to achieve a range of 8 grey levels. This gives a reasonable background exposure that allows you to see the object but does not interfere with measuring the targets. If the background is too bright to achieve this, the camera will choose the minimum exposure time and indicate the range of brightness expected. If the range is >16, try to reduce the light (turn off lights, shade the area, etc.) or the brightness of the background may interfere with measuring some targets. On the other hand, if the background is too dim, the camera will choose the maximum exposure time, and again indicate the range of brightness expected. If the range is < 4, there is not enough light to see the background very well (but target measurement will be unaffected).

NOTE: With exposure times over 50ms the background may look blurry if the camera is not held steady (the targets are fine though).

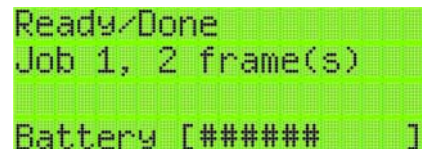
d. If the AutoExposure was unsuccessful, the camera will beep twice and display a message on the LCD indicating what was wrong. The most common reason for the AutoExposure failing is no codes are found perhaps because the lens cap is on, or the camera was not aimed at a code.

NOTE: To take another AUTO reading at any time just repeat steps a-b. If you do not like the AUTO settings, you can manually select the values. See the camera manual for instructions.

8. If necessary, insert the disk card (it will not go all the way in if you insert it incorrectly). Then close the door to prevent dirt or dust from getting in the camera. You will receive a warning message if the door is not shut but the camera will still take pictures. The PCMCIA disk can be inserted at any time with the power on or off, however, the camera will not take a picture without a card.

WARNING! Your camera may have one or two available slots. If you have two slots, you must use only one card slot. If a card is put in each slot, the camera will not operate properly and damage to the disk card(s) may occur!

9. Set the Job Number. The pictures for each measurement are saved in separate Job directories on the disk. The second line of the display shows the current Job number and the number of pictures on the disk for that job. Job numbers are changed by simultaneously pressing the Up and Down switches. Then press the Up or Down mode switch to cycle the job number. Subsequent pictures will then be stored in that Job directory on the disk.



The image shows a green-tinted LCD display with three lines of text. The first line reads "Ready/Done", the second line reads "Job 1, 2 frame(s)", and the third line reads "Battery [#####]".

NOTE: If AUTO exposure is selected, the AutoExposure procedure (see step 6 above) is done each time you change to an empty job directory.

10. To take pictures:

- a. Use the viewfinder and laser pointers to aim the camera. Pressing the Down button will turn the lasers on, pressing it again will turn them off. **NOTE:** The lasers will turn off after awhile to keep them from getting too hot. Pressing the Down switch will turn them on again.

- b. Press the Trigger button to capture an image. The lasers will turn off during the picture. The LCD display will indicate when the next picture can be taken by saying "Ready" and beeping once. Up to 8 pictures can be taken at a very high rate (up to 2 per second) until the memory is full. Then, the camera will take a picture every 3 to 4 seconds typically.

- c. The Delete switch (the small red switch on the front of the camera) deletes any unwanted pictures. Hold down the Delete switch till the LCD displays the delete message. Every time the Delete switch is pressed, the last picture taken is deleted.

WARNING! Deleted pictures CANNOT be recovered.

11. Remove the disk card for processing. The disk can be removed with the power on but after opening the PCMCIA door you MUST wait a few seconds until the INCA3 displays a message that it is safe to remove the card. If you don't, the card will not be recognized if you re-insert it until you re-boot the camera.

WARNING! After removing the card, be sure to close the door and to place the lens cap on the lens. Please make it a habit to do these two things because it is VERY important to keep dust out of the camera and to keep the lens clean.

NOTE: When taking pictures, the last line of the display scrolls various status messages across the screen. These include:

1. The current shutter exposure time. The display will also say "AUTO" if the shutter speed was automatically chosen.
2. The current strobe power level. The display will also say "AUTO" if the strobe power level was automatically chosen.
3. The amount of disk space left. When less than 10MB remain on the disk (typically enough for 10 or so pictures), the camera will start to beep.
4. The battery status. When the battery is low the camera will beep.