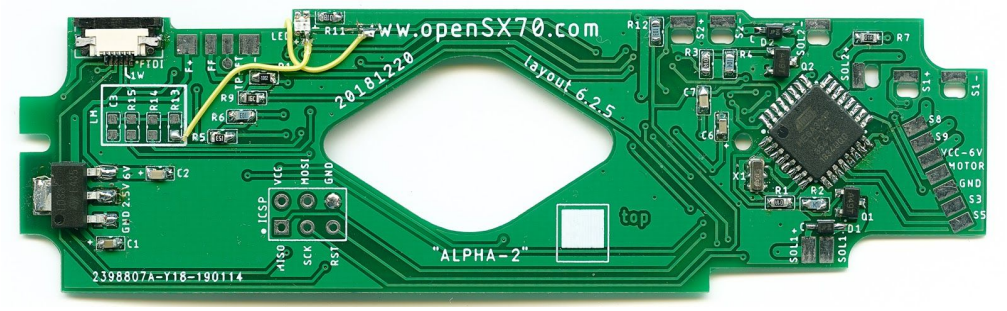
openSX70 operating instructions

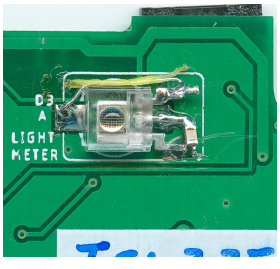
version openSX70_20190523A
This document assumes that you have a properly converted camera with the Arduino sketch 1_openSX70_20190523A or newer.



(alpha-2 reworked PCB)

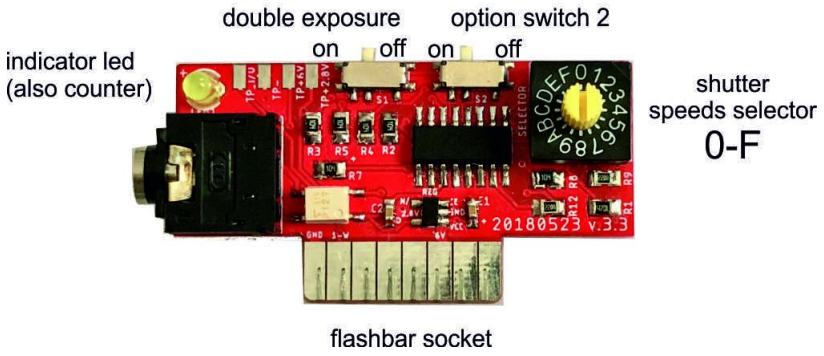
(auto long night exposure with tripod)

Note that some configurations might need to be made depending on your specific hardware and light sensor. Here TSL235 is assumed. So called “magic number” can be changed for auto exposure calibration.



(TSL235 light sensor)

The new Alpha boards with light to frequency sensor allow use of the openSX70 camera with or without dongle: when no dongle is inserted the camera works in auto mode at ISO600. This can be the uDongle or any other later version of the Dongle. Some dongles might need a parameter change on the software. (NOTE: the uDongle by itself on a “normal” SX70 **DOES NOT WORK** and can damage your camera).



(The uDongle. Connects to the flashbar socket on the camera)

If you connect a flashbar INSTEAD of the Dongle the camera will shoot triggering the flash as a normal SX70. The darker/lighter wheel in this case does nothing. Exposure time will be around 40ms.

These are the uDongle parts:

Shutter speeds selector:

MANUAL EXPOSURE:

It has 16 positions, marked 0 to F(15). Positions 1-A correspond to different shutter speeds:

openSX70 uDongle cheat 20180512					
dongle	EV	f.8 equiv.	aperture	actual ms	raw t ms
0	**17**	1/2000	11	1	10
1	**16**	1/1000	10	2	12
2	**15**	1/500	9	3	13
3	**14**	1/260	8	4	14
4	**13**	1/130	8	8	18
5	**12**	1/60	8	15	25
6	**11,5**	1/45	8	22	32
7	**11**	1/30	8	35	45
8	**10,5**	1/23	8	43	53
9	**10**	1/20	8	80	90
A	**9**	1/10	8	140	150
B	**8**	1/4	8	290	300
C	AUTO 600			S1 exposure	S2 LM helper
D	AUTO 100				
E	POSITION "T"			normal--> <--multiple	(see below)
F	POSITION "B"				

Please bear in mind that this values are an estimation based on (non very scientific) tests. First column is the selector position, second is the EV value or corresponding option. Next is the exposure time (theoretical) for f.8 aperture. Next is the (again theoretical) actual aperture. Then is the actual shutter speed. The last column is the "raw" ms and is the time including the mechanical delays).
The faster shutter speeds are not possible due to mechanical limitations of the shutter mechanism. For me expressing the exposure in EV or "exposure value" is more accurate and truth.

LONG EXPOSURE MODES:
Slot E: is for T-mode. The shutter opens when you press the first time and closes when you press again a second time. I guess this is for really really long exposures.

(Bulb and manual exposure tests)

Slot F: is B-mode, or Bulb mode, the shutter remains open while you keep the red button pressed.
EXPERIMENTAL: If Switch S2 (mirror delay) in ON in this mode:
-aperture will be as in flash mode (solenoid#2 engaged, don't know if it will hold)
-when you release the button flash will fire (dongle flash of course)

AUTO EXPOSURE MODES: (also with dongle removed, ISO600)

Slot C is auto exposure at 600ISO (same as without dongle).
Slot D is auto exposure at 100ISO.

Flash 3.5 jack:
It is compatible with an sorts of strobes and studio flashes and lights. Speeds 1/60 and slower **all** trigger the flash immediately before sending the close shutter command.
Solenoid #2 for distance flash compensation **does not engage**. So pictures are taken at full f.8 aperture flash no matter what distance or where the focus ring is.
This will yield to overexposed pictures unless you can control the flash power.

(burnt flash picture at f.8)

Switch 1: double and multiple exposures:

S1 switch if in OFF position it will shoot and eject in a normal fashion.

If in ON position (on the left looking from the front) it will engage multiple exposures mode. It will keep the shutter closed after the first shot allowing for multiple exposures until the switch is back in the normal position and the red button is pressed.

This is intended for use in both AUTO and manual exposure modes, except in long exposure modes B and T.

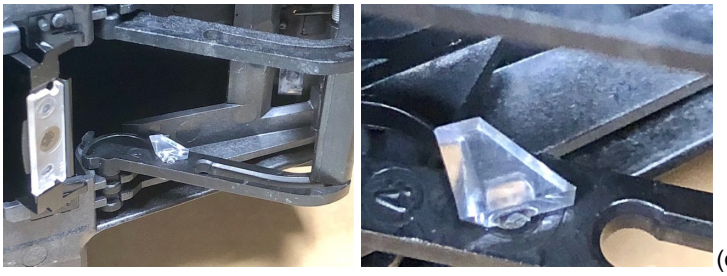
(double exposure shot)

IMPORTANT NOTES:

- after the first shot the shutter is closed and the mirror remains up, impeding thus the reflex viewfinder operation.
- as a safety measure the LED will lit after 60 seconds, and the camera will eject after 5 minutes from the first shot. Maybe it is too much, but hey, I need time for my shot. This is to avoid potential damage to the Solenoid#1 operating the shutter. This limitation could be removed in software, but you do that on your own, I do not want to (potentially) wreck your SX70.
- **Do NOT attempt to close the camera while the mirror is in this position because you can damage your camera.**
- Another use of this feature is wait to eject in a darker environment.

Switch 2: exposure helper

S2 is used in conjunction with the optional viewfinder LED.
Viewfinder LED is a modification of the camera using a viewfinder from a sonar camera that has a special prism. This allows the dual-colour LEDs to be seen (as an indicator) through the viewfinder.

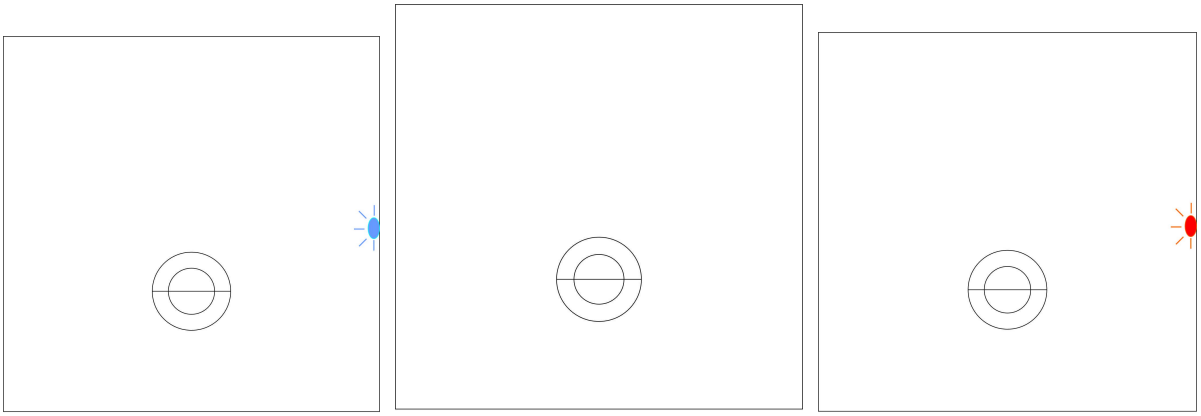

(optional sonar viewfinder prism relays the led information)

The LEDs relay information through the viewfinder depending on how you are using the camera:

Auto mode: if S2 is off the red LED lights to indicate low light situation and slow shutter speed. ISO600 only.

(one of the first auto exposure tests)

Manual exposure: if S2 is ON the LEDs act as an indicator: red means too fast shutter speed, blue means to slow. Both LEDs off means that the shutter speed is correct.



exposure too slow (EV too low) exposure correct (no led) exposure too fast (EV too high)

Bulb mode: If you shoot in B position with S2 in the ON position it will engage the solenoid2 (as in flash) and if you connect a flash to the dongle it will trigger when you release the button. For instance for light painting and flashing at the end.

Indicator LED (counter)

The LED on the dongle acts also as a sort of counter:
-when you insert the pack and ejects the darkslide it will remain solid on.
-while the pack is in use, when you open (power-up) the camera it will blink the remaining number of pictures (on an 8-picture pack basis).
-once the camera thinks the pack is empty the LED will remain solid on, this is on 8-picture per pack basis. The camera will keep shooting until the actual counter says “0”.

Red button operation:

The red shutter button has a behavior similar to the original: if you press and release you take a picture. If you press and hold you take a picture.
But it also has a hidden feature, a Self-Timer:
The openSX70 camera implements a 10 seconds self-timer function. If you double click quickly the red button (in any of the “normal” shutter speeds) the camera delays the picture-taking for 10 seconds. The LED on the uDongle will blink at an increasingly faster pace until the picture is taken.

Mirror delay is now fixed at 120ms (Ydelay).

original document link.