PHOTRON QUICK START GUIDE

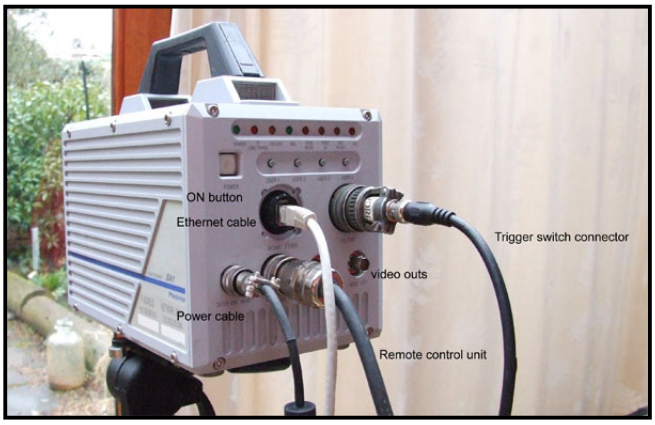
for SA-1.1, SA-2 (HD) and SA-3 cameras

Full details of all software and camera settings can be found on the specific camera manual (.pdf) file on the SlowMo DVD within the camera/laptop case.

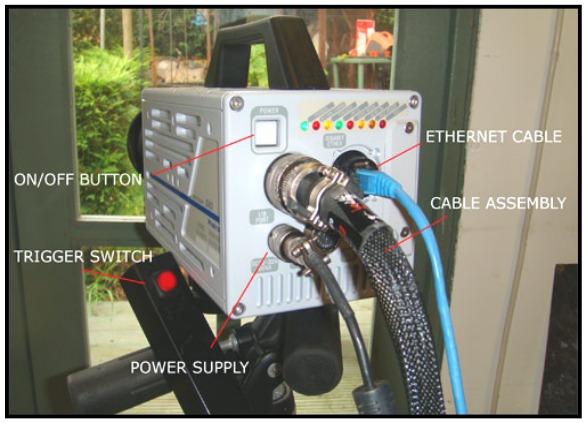
Start up

Connect power cable, Ethernet cable, Remote control with LCD display (if supplied), cable assembly (with trigger switch) to camera body.

If running off batteries, all cameras are 24V (cables are available to suit V-loks and a 2 x 12V battery pack including inverter can be hired – it is important that you inform Slowmo if you want to use batteries).



SA1/SA2 Connections



SA3 Connections

Tip: best to use gaffer tape to secure the 2 pin plug into the Photron SA1 AC adapter.

Note: All cameras have both a ¼" and 3/8" mounting screw hole (via a special base plate for the SA3).

Connect to external monitor via Video Out. SA1 and SA2 cameras have SDI/HD-SDI out as well as analog. Only one type of device (analog or SDI) can display a live image at any one time. To switch between analog (e.g. when using viewfinder) and HD-SDI (e.g. when using HD monitor) video out on the camera, in LIVE mode, Camera Option, Video Out, Select either VBS or HD-SDI. You will see coloured bars on either device if the wrong video out format is selected.

Important Note: The text 'FIT' should be displayed on the video monitor/viewfinder. If not then you may not be seeing the whole image therefore press the USER1 (USER on SA-3) button on the back of the camera.

Should the USER button not be programmed, go Camera Options on the PFV software, click on Programmable Switches, select Image Fit from drop down list next to a USER button. Click OK or Apply. Press USER button on the camera.

Connect Ethernet cable to SONY VAIO laptop.

Switch on camera. White square button on the back. Note: Laptop can be switched on at any time.

Computers

Sony Viao laptop running Windows 7. The windows password is always ‘slowmo’ and is the same for all slowmo computers. The hard drive space varies with each particular laptop. Note: it is possible to save directly to an external USB/firewire/eSata hard drive (see Saving section). The laptop normally has an extended life battery.

After a few seconds, you should see the Red IF LINK LED light on the camera. This indicates that the Ethernet connection is good.

If using the shuttle computer, after first start-up please press the Num Lk key before entering the windows password.

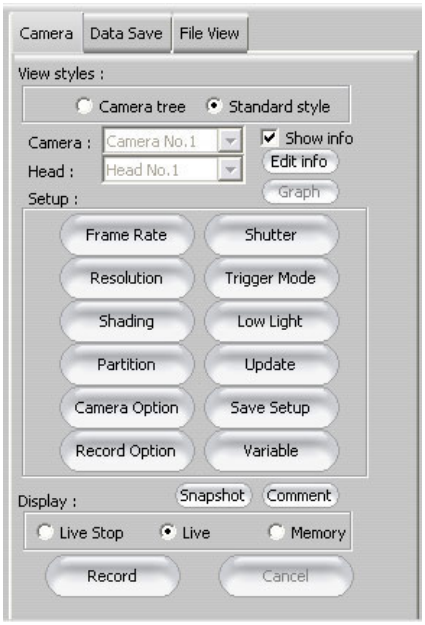
Photron Fastcam Viewer (PFV)

Start the PFV3 program (shortcut in centre of desktop). It will begin to detect the camera (you will see flash screen as shown below with a progress bar indicating camera detection) and you should now get a live feed.

If you don’t then leave the laptop switched on and turn off camera. Make sure Ethernet cable is correctly connected and switch camera back on. Wait a few seconds. Start PFV.

Capture Settings

From the panel on the right hand side, select frame rate, resolution, shutter speed, trigger option (start, centre, end or manual – any variation e.g. 25%-75% trigger).



Resolution: If 16:9 is your format, then it is sometimes worthwhile capturing with a little more vertical resolution (e.g. 1024 x 768/640). This will increase the chances of your subject/movement being in frame and the 16:9 window can be taken from within this resolution during the edit.

Tip: you can frame up, for example, using 1024x576, but then change to 1024x768 prior to recording. You may need to black balance again if black balance was performed at the 576 resolution.

Main Trigger Options: assuming 10 s capture time (dependant on chosen frame rate and resolution)

Start – when triggered will record for 10s then stop
Centre – will record the 5 s before the trigger and the 5 s after the trigger (most used)
End – will record the previous 10s prior to triggering
Manual – Any variation on the above e.g. 2s before trigger, 8s after. Move slider to set.

Shutter Speed: this can be set above and beyond the frame rate. The default is always 1/frame rate (e.g. 1000fps – 1/1000s shutter speed). If your selected frame rate is OK but you want to see more sharpness (less motion blur) in the image especially with water droplets, small fragments etc, then increase the shutter speed (this will require more light). A very general rule is that if you have enough light then try to make the shutter speed twice the frame rate (e.g. 500fps and 1/1000s shutter).

All details of these settings plus total capture time is shown on screen in the top left hand corner.

Select colour temperature (e.g. outdoor lit) – Camera Option, Colour Adjust, Color Temperature – 5100K (Tungsten – 3100K)

When all is set, make sure you perform a black balance.

Black balance – lens cap on, Shading button, Calibrate button. Do so every time at start up and each time after changing frame rate or shutter speed before recording again.

Also perform a black balance at the first hint of any artefact (namely vertical banding in the darks in low light) being introduced into the image.

You can save all the above settings (fps, resolution, etc) by clicking on Save Setup. Give the set-up a filename and save to location on computer. To load (i.e. start of a new shooting day or when the camera has been powered off) click Save Setup, Load and browse to appropriate file.

Ready to Record

Click on the Record button.

With a Start Trigger it will say TRIGGER IN first, then press again to start record.

With a Centre, End or a manual trigger it will say ENDLESS RECORD, then press again to record. The last two lights (REC READY and REC) on the back of the camera will begin to flash, this is a good indication that the camera is armed and ready.

Triggering

You can trigger the camera by clicking on TRIGGER IN/ENDLESS RECORD button in the PFV Software OR you can use a trigger switch connected via BNC cable to the single TRIG SW IN cable on the cable assembly (usually isolated from the other cables) or the custom trigger only connector (not always present).

The trigger switch method is preferred as there is no delay plus you can view the subject more easily rather than having to stay with your hand on the laptop.

After triggering, the camera will record until its internal memory is full and then stop. It will then automatically jump to memory mode.

Note: The SA-3 records true 12Bit images. This bit depth can be reduced to 8Bit if desired. The result of this increases the available capture memory by a third. This setting is probably only necessary if one is trying to maximise capture time (i.e. have a long sequence to film). To change from 12bit to 8bit, go to Camera Option, select 8Bit and restart both the PFV software and the camera.

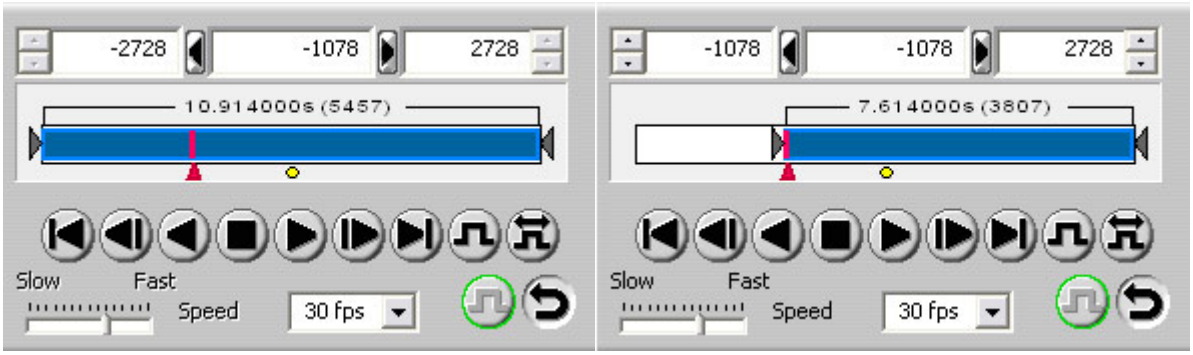
Viewing last shot

Use the play buttons as shown in Saving section. Click and drag the red line cursor to review shot.

Saving

Click on DATA SAVE Tab.

Mark in/mark out as desired. If you click on the small black triangle next to the frame number window (see below) it will mark in at the point of red cursor. Do the same for mark out. Alternatively you can click and drag the ends (grey triangles at the ends of the blue section) of the timeline inwards.



Click left arrow (black triangle) next to –2728 number window to mark in

Best quality is to Save as TIFF with the option of 16 bit, highest bits. If set at 8Bit images (SA-3 only, see Triggering section Page 3), then save as 8Bit Tiffs (not 12 or 16 Bit). You can save at the bit depth of the sensor which is 12bit. However you will find that few software can open 12Bit images.

Raw format:
The same image quality can also be achieved by selecting the RAW option from the drop down list. This will result in a much quicker download than with TIFFS and you will use a third of the drive space. If you have time between takes then choose TIFFS. If you quickly need to download so you can take another shot or you are running off batteries then choose RAW (with bayer save) and convert to TIFF after the shoot.

SlowMo recommends saving as MRAW, bayer save, with the option 'Bit depth of sensor' when download time is crucial either due to battery power or frequency of the filmed event/subject. This method results in the smallest files at the highest quality.

The RAW files are Photron specific and cannot be opened in any other software. They must be converted to TIFFS at a later using the PFV software before they can be edited.

Important Note: Make sure Bayer Save boxed is ticked when saving as RAW format.

If capturing at reduced resolutions especially during industrial applications, for example, 512 x 512, then you can save as uncompressed AVI (select AVI from list, click on Option – No compression). Alternatively save as individual JPGs. This will result in much smaller but ultimately more manageable files.

Save to the laptop hard drive or connected powered external hard drive. Select the save drive location via SAVE PATH.

Note: When capturing full HD images with the SA2, an eSata connected hard drive is essential for both downloading and for backup. This will dramatically improve workflow and allow the backup of images to be done quickly either during or at the end of the shoot. If only a USB drive is available then it will takes hours to backup the shots. The Slowmo shuttle computer has built in eSata connectors. Slowmo will provide a drive if one is available, though it recommends that one is purchased especially for your shoot.

Keep an eye on the drive space. If you get a File Save Error message when saving, it will likely be because the drive is full. Save to external hard drive as necessary.

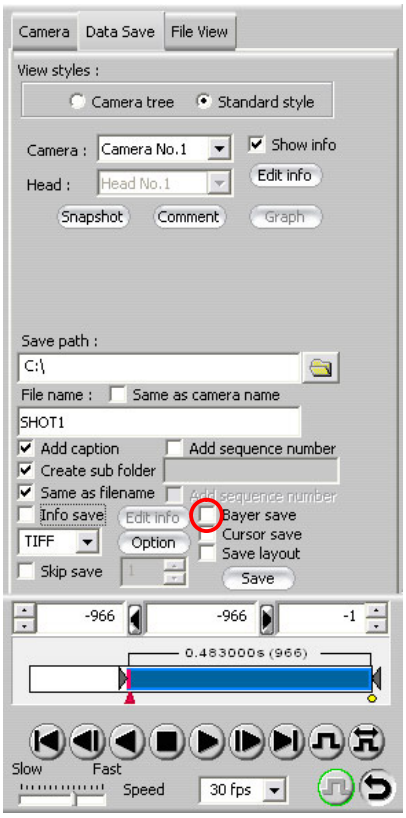
16bit files are large, each 1024x1024 image is 6mb (SA-1 and SA-3), one second at 1000fps results in a 6GB file. With the SA-2 at 2048 x 2048, this would be 24GB. So where possible, crop as tight as you can. It will save on download time and hard drive space. Saving files at 1024x576 or 1920x1080 (16:9) again significantly decrease file sizes.

Alternatively you could save at 8bit, which is half the size. Download times are 25% faster when saving as 8bit. Not preferred for media applications.

Best to keep files name short e.g. SHOT1, SHOT2. Do not save as shot1-dayone-highspeed-2000fps-fine-weather.tif

On the Data Save tab, the only items that need to be ticked are:

Add Caption
Create Sub Folder
Same as file name



Sample Data save tab
Note: When saving as RAW/MRAW, Bayer Save boxed must be ticked (red circle)

It is worth viewing the first saved clip of the day, to make sure all is OK. To do so, go to FILE VIEWER tab. Open. Browse to saved folder. Select the *.cih file amongst the TIFF files and view clip. Remember to close the window (X in top right hand corner). If opening a RAW sequence, you will see only the *.cih file displayed in the browse window. Select this file and it will open the RAW files automatically.

Converting RAW to TIFF

For single file conversions:
To convert the opened RAW files to TIFF (can be done at a later time prior to transfer to edit). Select TIFF from the drop down menu, and click on Option to select 16 bit, highest bits. Untick the bayer save box. Click on Save and it will bring up a Save As dialog box. Create a new folder, select it and click Save. This will then re-save all the RAW files into TIFF inside the new folder. The original RAW files will remain.

For multi file conversions:
Here you can use the Photron batch converter. This is viewable on the top menu bar when you are in File Viewer tab. Basically you select the folder where all the Raw files are, select where you want them saving to using the edit button on the Save Path and Filename section, select Create folder and same as filename. Choose TIFF, 16 bit, highest bits and untick the bayer save box. Click Save and it should work thru each one in turn.

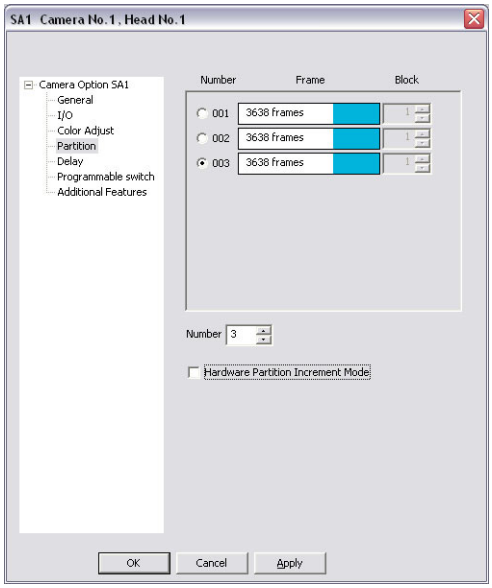
To capture again

Simply go to the Camera Tab, click back to LIVE and press RECORD.

Memory Partitions

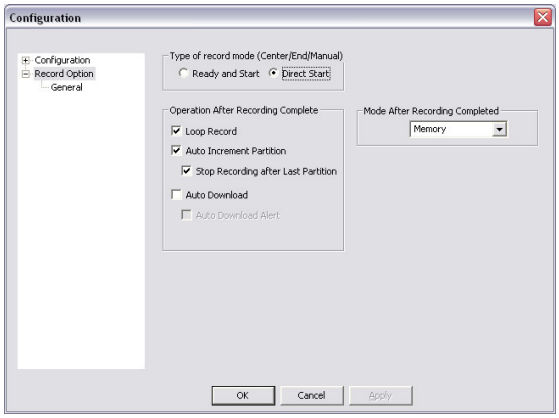
Use memory partitions to enable several captures before having to download. Each partition will act as a separate record and download. Choose the desired partition via the Partition button on the Camera tab.

To set up memory partitions (in LIVE mode) – Camera Option – Partition – Adjust number of partitions.



To auto increment from one partition to the next – Record Option – Operation After Recording Complete:

Direct Start.
Loop Record ON
Auto Increment Partition ON
Stop Recording After Last Partition ON



Then set the trigger option as desired. It will apply to all partitions.

At these settings, you will manually click on Record to go to Endless record. Then with each trigger press, the camera will record, stop, and then arm itself again (Endless Record) and be waiting for the next trigger point.

Important Note: If you overwrite a partition whilst in auto-increment mode, then it will also overwrite the next partition. For example if you captured to 3 partitions using auto mode, to overwrite partition 1, first go to manual mode first. See next paragraph. If you don't then partition 2 will also get overwritten as it will jump automatically to it.

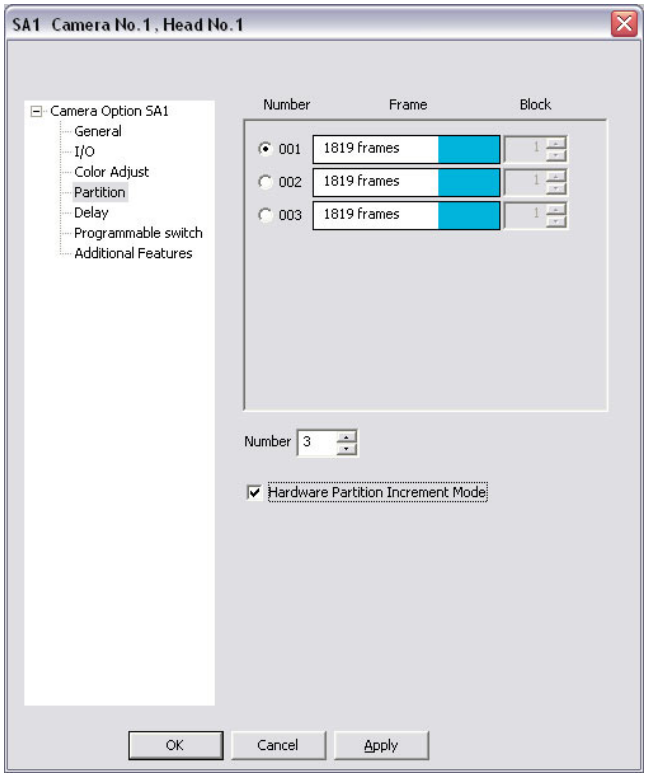
To jump to the next partition manually put the following to OFF - Loop Record, Auto Increment Partition, Stop Recording After Last Partition. Treat each partition as a separate capture. Select Partition by using the Partition button.

I would choose auto-increment mode if you have to capture several takes in a short space of time. If you have say a couple of minutes between takes, then there is enough time to manually select the next partition. You can then go back to any partition and overwrite it as desired.

Triggering without the laptop connected

To give yourself a little bit more flexibility when moving around, the camera can be triggered without the laptop connected. There is one setting you need to change in order to do this. Tick the check box on the Partitions windows that says 'Hardware Partition Increment Mode'.

Note: this check box is not necessary if you only have one partition.



Now set up the partitions as described in the previous section, make sure Partition 1 is selected (will say P-001 in top left corner), press Record to get the ENDLESS REC. Then simply close down the PFV software and unplug the ethernet cable.

As a check to make sure all is OK, simply look in your viewfinder it should say ENDLESS REC. Alternatively, look at the REC READY and REC lights on the back of the camera. In ENDLESS REC mode they will be flashing. When you press the thumb trigger, the REC button will go solid red for a few seconds, then it will return back to both lights flashing. This means that Partition 1 has been recorded to and the camera has re-armed itself on Partition 2. It is now waiting for another trigger point.

When all partitions have been recorded to, you will get no flashing lights, only a green power button. Connect the ethernet cable, wait a second for the camera to be recognised then start up the PFV program.

The program will start up in LIVE mode so you need to click on MEMORY to see what you have just recorded. You can now view each partition by clicking on the PARTITION button. Save each partition in the normal way.

To go again, make sure you are on Partition 1 and go to ENDLESS REC.

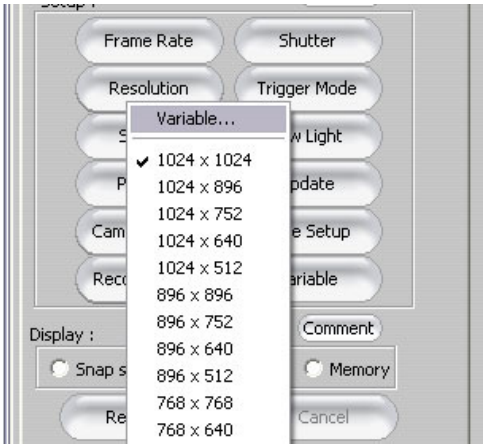
Variable Resolution Settings

You can set the resolution to a size that is not on the preset resolution list (Note: Click Variable button first to see if preset already installed).

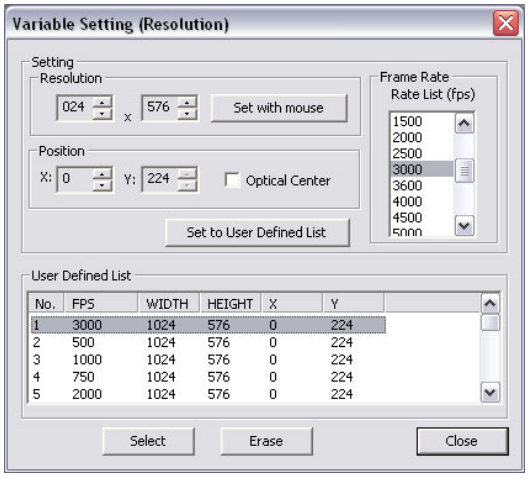
If filming at 16:9 then it is recommended to capture at 1024 x 576 (16:9). This will reduce the file sizes from capturing using the full sensor (1024 x 1024) and decrease the download time. Note: The SA-3 and the SA-2 have preset 16:9 resolutions. The SA1.1 does not.

The example below will tell you how to capture at 16:9 (1024 x 576) at 3000fps:

Click on Variable under Resolution



On the next screen…do the following



1) Set the resolution to 1024 x 576 by clicking up/down on the small arrows in the Setting Resolution section. Select optical center.
2) Click to highlight the frame rate you require at this resolution. It will show all available resolutions. In this instance the maximum is 10000fps.
3) Highlight a number on the User Defined List. This could be a filled in or a blank one.
4) Click on 'Set to User Defined List' Say yes to overwrite.
5) Click Select to make current.

If you would like to capture at a different frame rate, just repeat steps 2 to 4, but select a different number on the User Defined List. You can easily select a pre-stored setting by clicking on the Variable button.

Basic Workflow

1) Set frame rate, shutter speed, trigger option, colour temperature.
2) Black balance
3) Record
4) Review then mark in/out
5) Go to Data Save tab
6) Define save path (only needs doing once)
7) Enter filename for the shot
8) Save as TIFF, Sensor bit, highest bits OR Save as RAW with bayer save.
9) Click OK.
10) To record again, back to Camera tab, select LIVE, click RECORD.
11) Repeat steps as above