weisscam
HS-1

powered by
P+S TECHNIK

OPERATOR`S GUIDEBOOK

Version November 2006 - ArtNo. # 22135

EMERGENCY ADDRESSES

Support

Demo Clips
www.weisscam.com

Operator Forum
www.weisscam.com/forum

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INTRODUCTION

I would like to thank you for deciding to work with the new digital highspeed system WEISSCAM HS-1. This camera system gives you various tools to make incredible highspeed shots. You can make things visible which your eyes never could see. With WEISSCAM HS-1 you are using state-of-the-art technology with the massive advantage of digital recording.

As a certified WEISSCAM operator you are specialized in highspeed shooting. Your role is not only being an operator but also an advisor for the DoP and the Director. In particular with the new digital technology your expert knowledge is needed !

This OPERATOR'S GUIDE is your source of knowledge. Please read it carefully and do not hesitate to ask further questions or to add your own ideas.

My mission is to share my know-how and experience with you, allowing us to gather information and sharing experiences to help each other prepare for the new generation of the WEISSCAM.

Thank you for deciding to join me,

Stefan Weiss
DoP and Developer of WEISSCAM

Delivery Content

1 x	***Weisscam HS-1 Camera***
	Integrated Adapters for QuickLock Plate
	Accessory Shoe for ARRI Lightweight Support (LWS)
	Tape Hook
	12V AntonBauer Battery Mount
	(optional with IDX or V-Mount adapter)
	12V DC In 4 pol XLR Plug
	12V DC Out 4 pol Hirose
	Standard Viewfinder Holder
1 x	Video Viewfinder
2 x	Interchangeable Lens Mounts:
	1 x PL Mount Adapter
	1 x Nikon Mount Adapter
	(additional lens mounts, ie. Panavision, BNC-R, Canon EF)
1 x	Adapter Plate for S35 Bridge Plate
1 x	External Power Supply with XLR Cable
1 x	***Hand Unit***
	with Ramping Wheel
2 x	Connecting Cables to Camera
	(1 x 3m cable and 1 x 0.4m spiral cable)
1 x	Mounting Bracket for Hand Unit
1 x	Aluminum Camera Storage Case

1 x	***Control Unit***
	Pre-installed Operating System, WEISSCAMware, etc.
1 x	Power Cable for Control Unit
2 x	External USB 2.0 100GB Hard Drives
	2 x USB Connection Cables (for connection to PC)
1 x	Fibre Channel Converter Box
	1 x 10m Fibre Channel Cable
	1 x 20m Fibre Channel Cable
2 x	4,5m Firewire Cables 6 pin / 6 pin
1 x	1,5m S-VHS Cable
1 x	Aluminum Control Unit Storage Case

1 x	Weisscam User Guide Book (Art.No. # 22135)
1 x	WeisscamWare Software CD (Art.No. # 22136)
2 x	Weisscam Connection Charts (Art.No. # 27363)

Precautions

Please read carefully.

- ***MAX. 60° C - Do not expose the camera or Control Unit to high temperatures.*** In very hot setups, prevent overheating of the camera by using styro and / or a fan to get cool air close to the camera. The ventilation slot at the righthand side of the camera is the „AIR IN" slot! The actual system temperature is shown in the status line in the „Camera Control" window. More than 60°C for El. Temp. or more than 65°C for Power Temp. endanger your equipment. This is especially very important when shooting top shots.

- ***Avoid direct sun light.*** Save Camera and Control Unit from direct sun light, Tungsten or HMI light.

- ***Avoid dust inside the Control Unit or Camera.*** Prevent dust from coming inside through the fans.

- ***Do not install additional software on the Control Unit.*** If doing so, product guarantee will become void.

- ***Do not connect the Control Unit to the internet.*** If doing so, product guarantee will become void.

- ***Be careful not to scratch the security glass in front of the CMOS sensor*** of the camera when you exchange the camera mounts. Always cover the CMOS sensor with a cap, when no lens is attached to the Camera.

- ***Do not unplug any cable while Camera or Control Unit are running!*** Always turn off the camera before disconnecting cables. If not this may cause break down your Windows operating system.

- ***When using Fiber Optic Cable***: Never bend, fold or crack them nor step on them. Clean them regularly and treat the connectors with care. Always use the connector caps when not using the cables. Remember the inner core of this cable is glass and very sensitive!

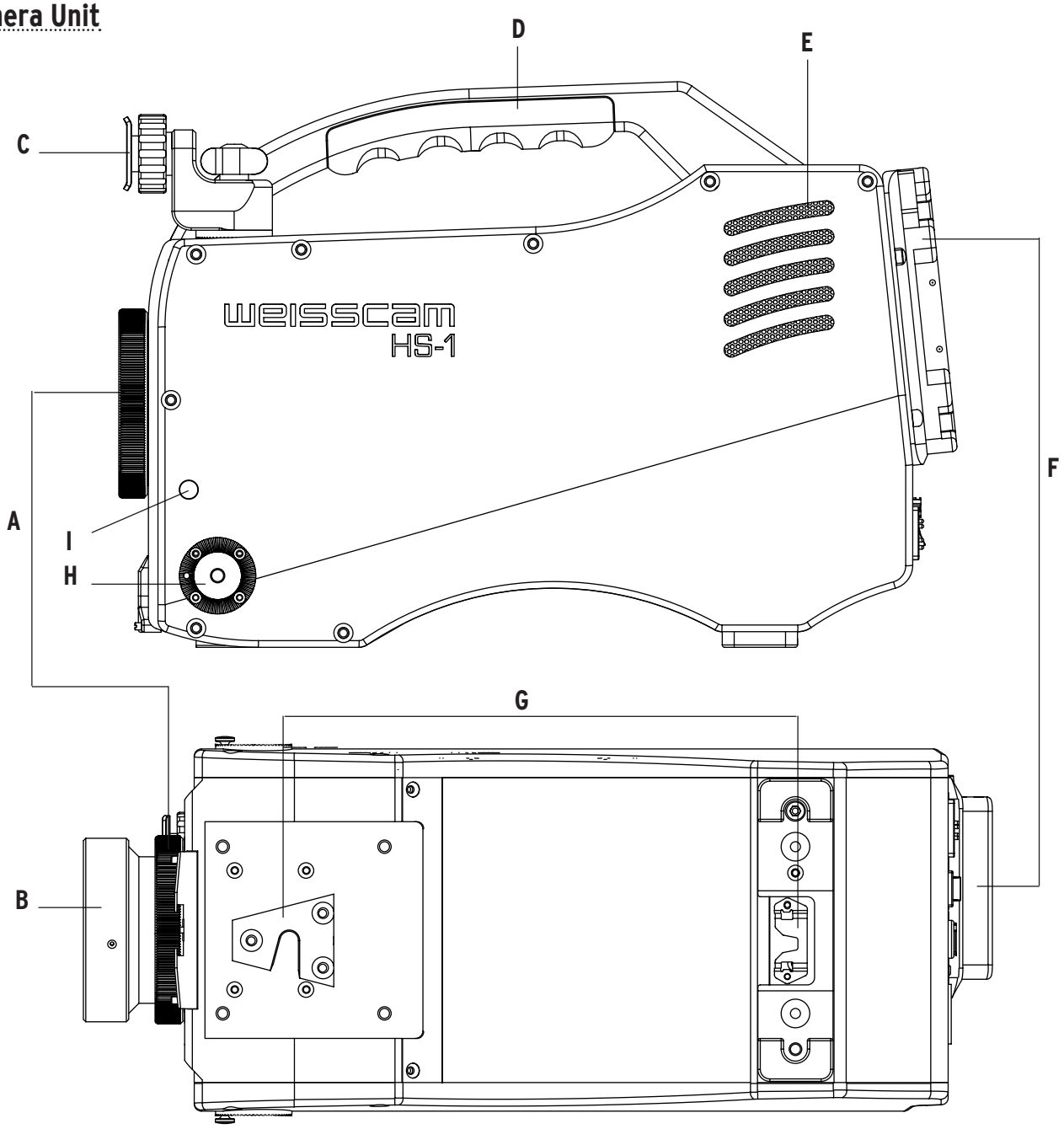
- ***Never completely discharge the battery pack attached to the camera.*** This might cause damage to the mains adapter inside the camera!

- ***Do not connect accessories to the DC 12V OUT connector that pull more than 3A.***

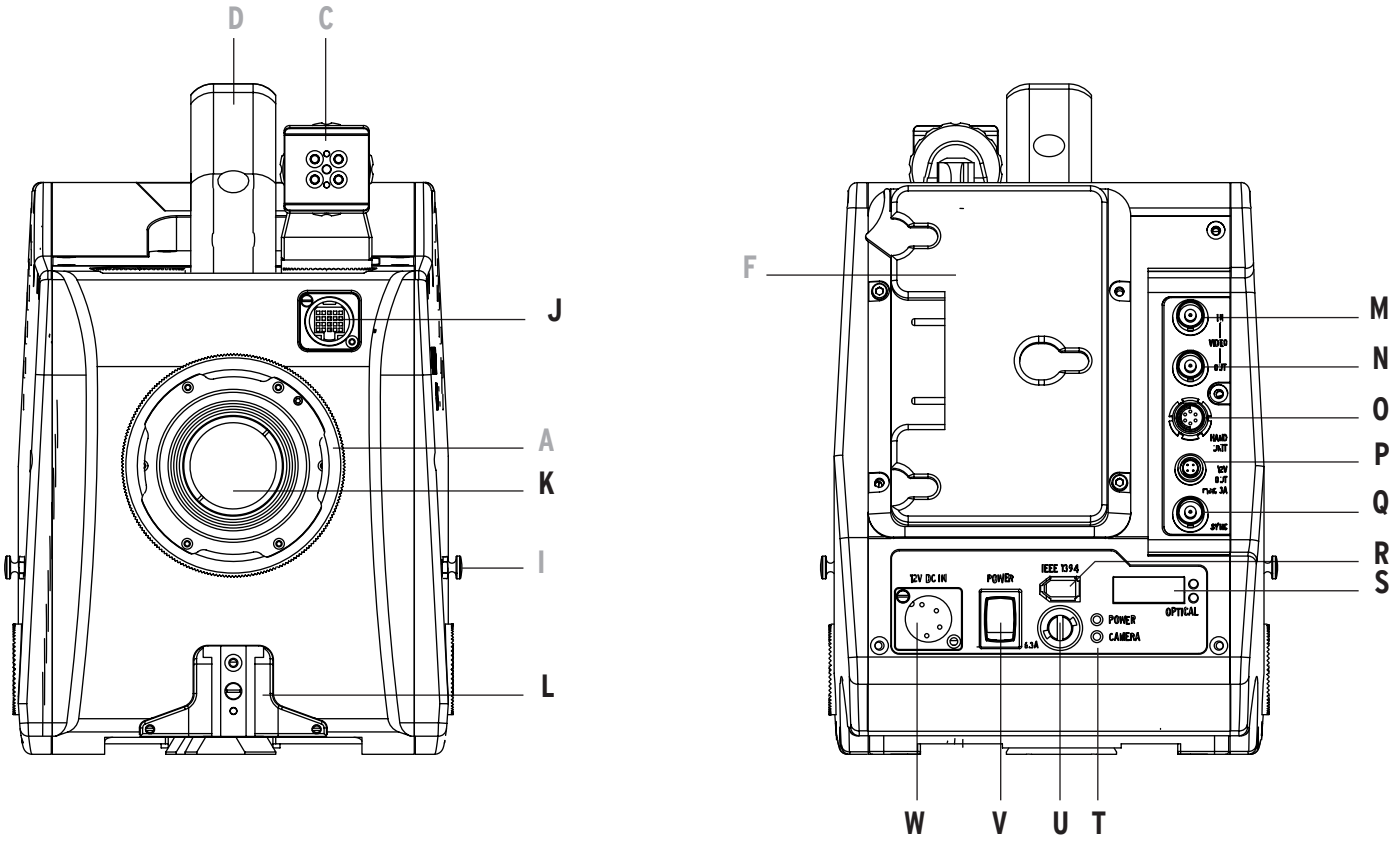
- ***The Weisscam HS-1 Camera is fuse protected with a 6.3V/T fuse.*** In case the fuse disconnects the power supply for protection reasons, disconect the camera from the power supply. After a view minutes the connection is released and the camera can be run again. Check the power supply and connected accessories for damages and malfunctions.

CONTROLS, DISPLAYS and CONNECTORS

Camera Unit

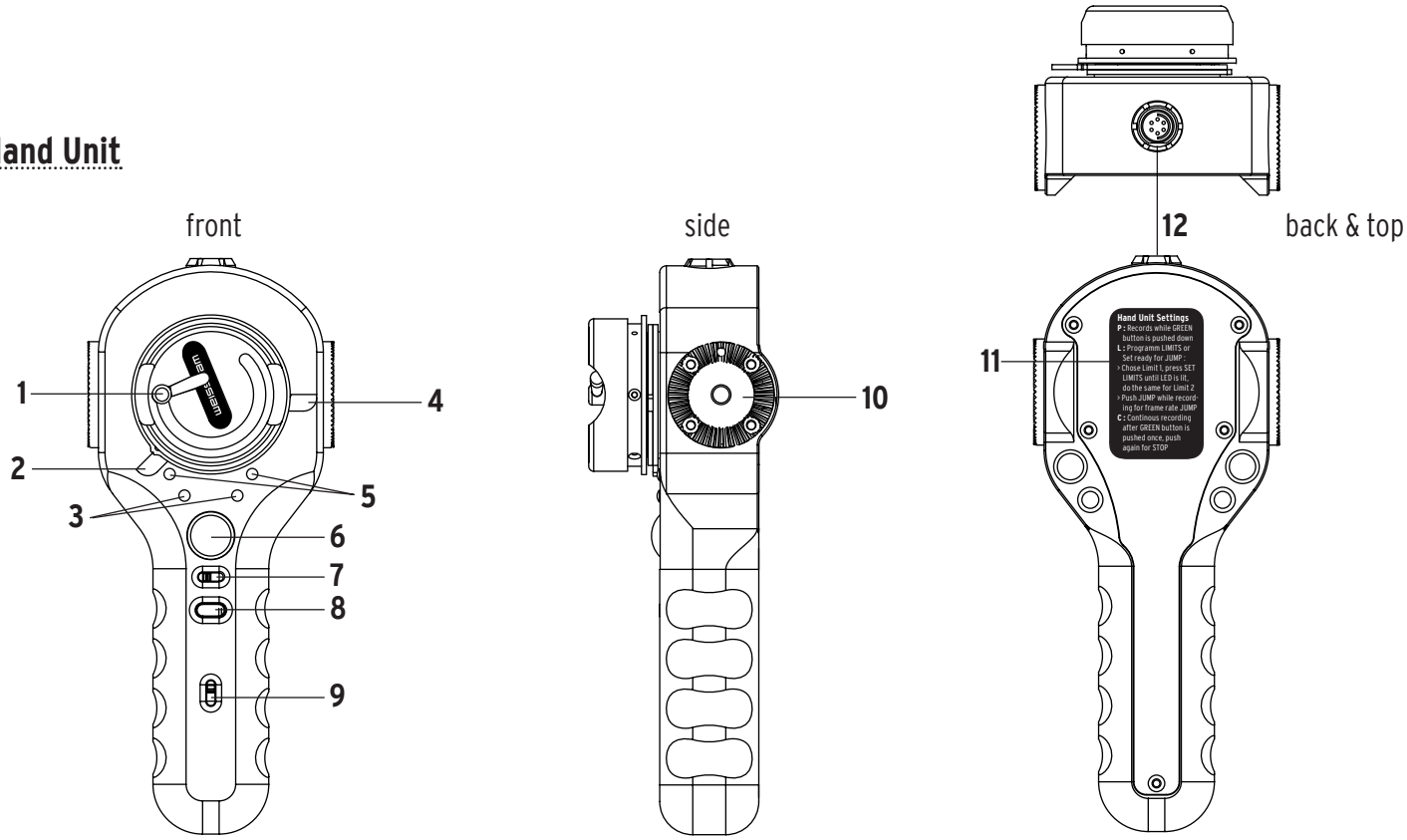


A – P+S Technik Interchangeable Mount
B – Camera Mount (e.g. PL Mount)
C – Viewfinder Holder
D – Hand Grip
E – Ventilation Slots
F – Battery Plate Anton Bauer Gold Mount
G – Integrated Adapters for Sony QuickLock Plate
H – Accessory Mounting Plate (Rosette) for Hand Unit
I – Image Plane / Measuring Tape Hook



J – Viewfinder Connector (Hirose 20 pin)
K – Security glass in front of CMOS sensor
L – Accessory Shoe for ARRI 15mm Lightweight Support (LWS)
M – Video In (BNC)
N – Video Out (BNC)
O – Hand Unit (Fischer 6 pin)
P – 12V Power Outlet for Accessories (Hirose 4 pin)
Q – BNC Sync (for future applications)
R – Firewire Connector
S – Fiber Optical Line (FOL) Connector OPTICAL (Duplex-SC)
T – Control LEDs (Camera connected; Power supply)
U – Fuse 6.3A/T exchangeable
V – Power ON / OFF Switch
W – 12V XLR Power Supply Plug

Hand Unit



1 – Fastener for Limits
2 – Limit Stop
3 – Control LEDs (Green ***STANDBY*** / Red ***RECORD***)
4 – Limit Stop
5 – Two LED to Control Limit Settings (blue)
6 – Green START / STOP Recording Button
7 – Hand Unit Program Switch
8 – SET LIMITS Button or JUMP Button (During Recording)
9 – Power ON / OFF Switch for Hand Unit
10 – Accessory Mounting Plate to Attach Hand Unit to Camera with Hand Unit Bracket (part of delivery content)
11 – Short Instructions for Hand Unit Program Switch
12 – Connector for Camera Connecting Cable (Fischer 6 pin)

Hand Unit Settings

P : Records while GREEN button is pushed down

L : Programm LIMITS or Set ready for JUMP :

› Choose Limit 1, press SET LIMITS until LED is lit, do the same for Limit 2

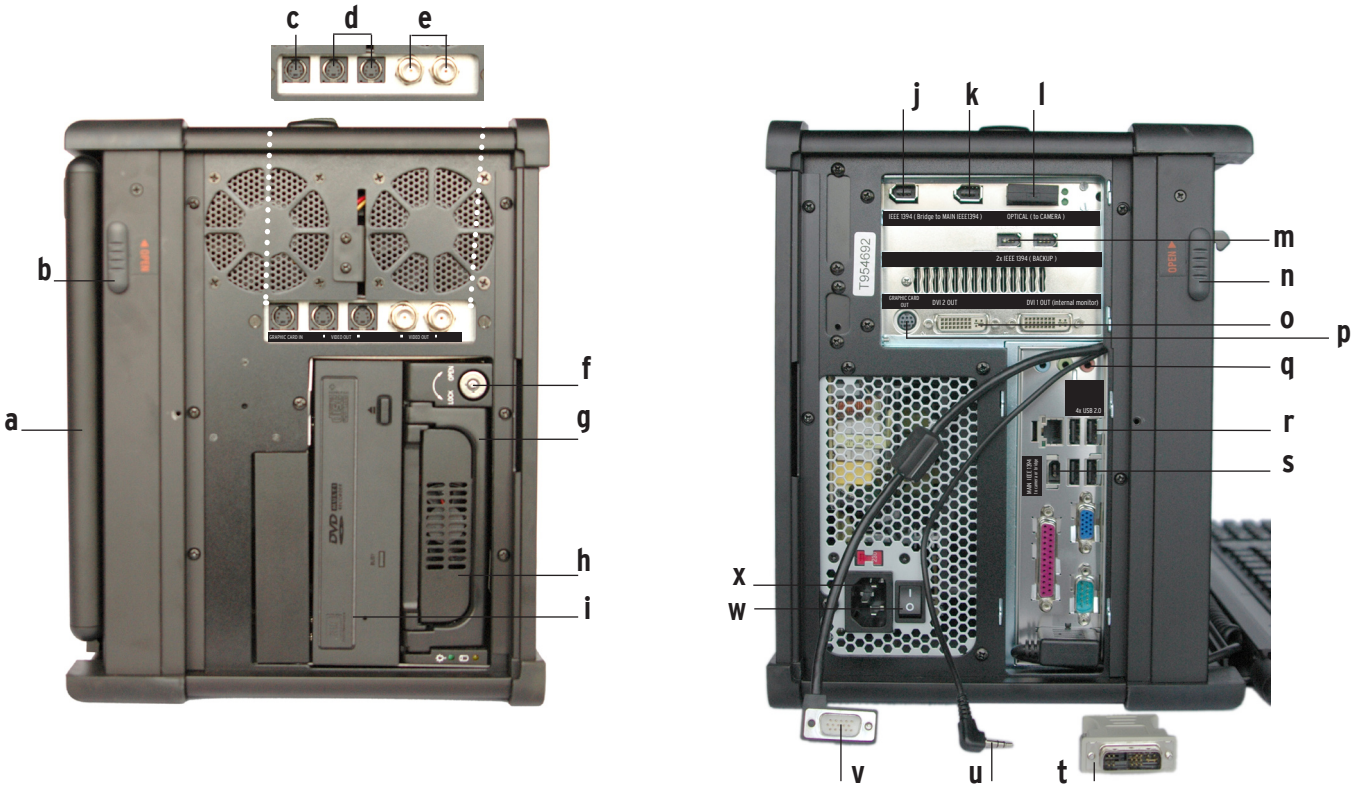
› Switch to **C** and start recording

› Push JUMP while recording for frame rate JUMP

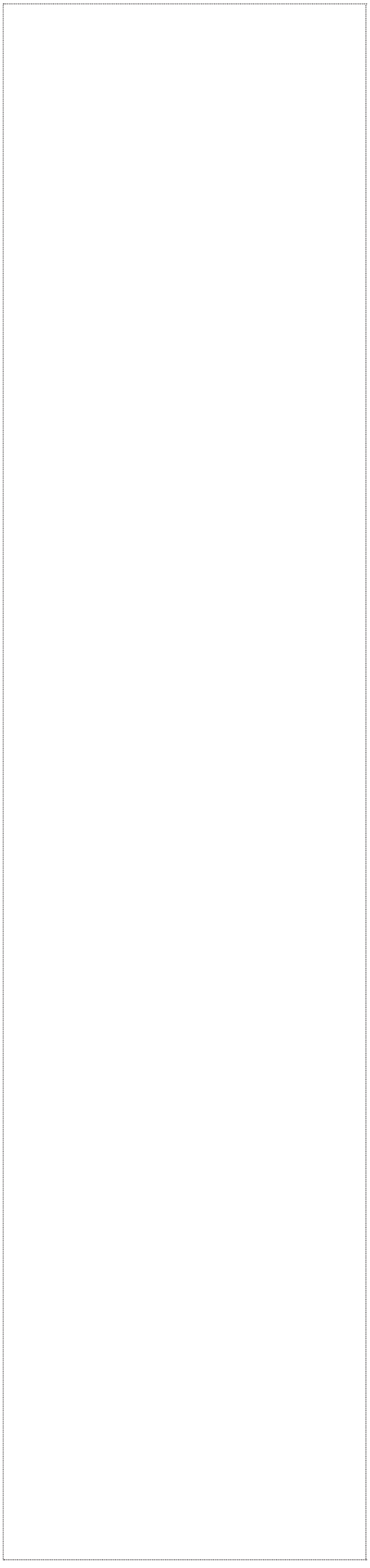
C : Continous recording after GREEN button is pushed once, push again for STOP

Control Unit

1 – LED Power On
2 – LED Hard Disk Status
3 – Screen Settings Menu On / Off
4 – Select / Submenu
5 – Navigate right
6 – Navigate left
7 – Reset Button
8 – General Power ON / OFF Button



a – Integrated Keyboard
b – Push Switch to Open Keyboard
c – Graphic Card Out (S-VIDEO)
d – 2x Video Out (S-VIDEO)
e – 2x Video Out (BNC)
f – Security Lock for Removable Hard Drive
(HDD will only be recognized if set to locked position)
g – Pull Handle for Removable Hard Drive
h – Removable Hard Drive
i – DVD Rom Drive (Reader / Recorder)
j – Firewire 1394 Connector (Bridge to MAIN IEEE 1394)
k – Firewire 1394 Connector (Bridge to MAIN IEEE 1394)
l – OPTICAL to Camera (Fiber Optical Line FOL)
m – 2x Firewire 1394 Connectors (Backup)
n – Push Switch to Open Keyboard
o – DVI 1 Out (Internal Monitor)
DVI 2 Out (Only usable, if GRAPHIC CARD OUT is disconnected)
p – Video Splitter In (S-VIDEO)
q – Sound Connectors
r – 4x USB 2.0
s – MAIN Firewire 1394 connector (to Camera or Bridge)
t – DVI to VGA Adapter for Internal Monitor
u – Cable to Connect Onboard Speakers (Integrated in Internal Monitor)
v – VGA Connection Cable for Internal Monitor
w – Control Unit Power ON / OFF Switch
x – Control Unit Power Plug



BEFORE SHOOTING

High speed shooting is very special skill and not as easy as you might think. Although it is digital and you can repeat everything, you have to consider a few facts:

Light

- First of all, high speed shooting needs a lot of light, no matter if you shoot on film or digital. To avoid the image flickering, use a minimum of 10 K or 20K tungsten sources. The HMI are not frickerfree although they say it. If you put 4 x 4K´s through a white diffusion, the flickering of every 4K´s is eliminated by the mixture of light.
- Always remember, you are shooting digital. That means, you have got a contrast range of about 5 T-Stops (and not a contrast range of up to 11 T-Stops like on film). The image has to be lit in between this contrast range!
- Do not compare WEISSCAM HS-1 with standard speed HD cameras or with film cameras. WEISSCAM HS-1 is an effect camera for high speed shots with a single CMOS sensor whereas HD cameras have three CCD sensors and film is film.....

Frame rate

- Not all situations are ideal for High speed shots. If you can not follow something with your eyes, it is good for high speed! If you can see and follow something with your eyes, it is NOT good for high speed.
- You do not always need the maximum frame rate! Get a feeling for the fps and discuss the frame rate with the DoP / Director:

Human dancing:	150 – 300 fps
Human sport:	150 – 300 fps
Pouring Hot Chocolate:	250 fps (depended on the thickness of the liquid)
Water, beer, drops:	950 fps

Download

Inform your customer about the download time after every shot. The download time from the camera to the hard drive of the control unit depends on the following decisions:

- the chosen resolution
- the chosen color algorithm
- the amount of frames to download

- The download time depends on finding the right mixture for

every shoot.

- You may offer a resolution of PAL / NTSC plus 20%. This reduces the download time and gives the customer the chance to make a digital zoom in post without loosing resolution
- For a long take, you may offer a “ramp”. Record just the most important thing in high speed and the rest in normal speed. Trigger the ramp early enough so the post have enough frames to cut on music
- You may choose a faster color algorithm. But show it to your customer before and let them decide whether they want the slower and sharper color algorithm or the faster color algorithm.

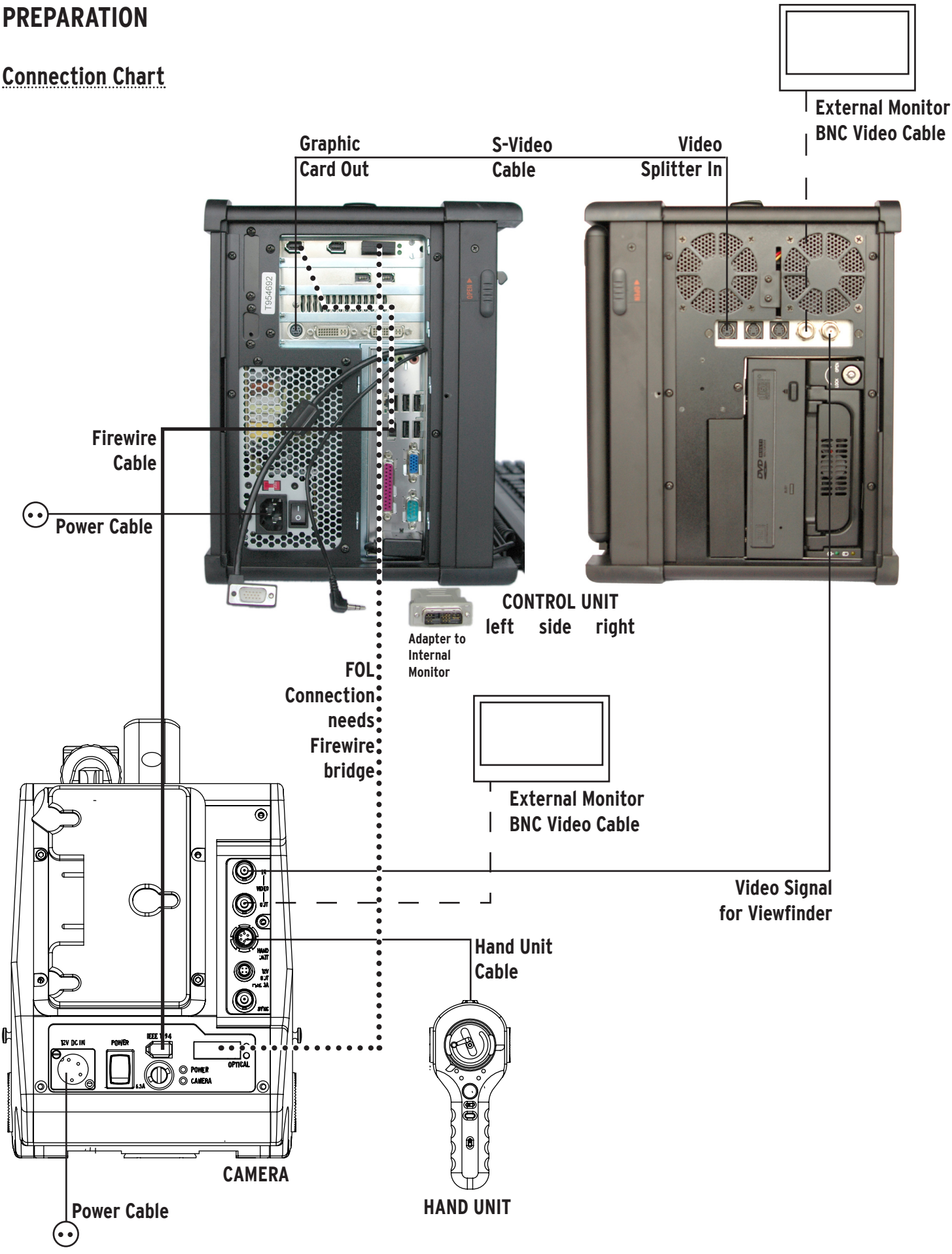
Focus

When shooting high speed, you normally struggle with the focus, because the depth of field is very shallow. It always helps, to fix the camera and mark the focus area. To get the focus by monitor, put something with hard edges inside the frame. If you cannot see the focus, change the viewing color algorithm to “PCO”. How to do this, see chapter Software > “Window: Options”

The backfocus of the camera is calibrated. So you can use the tape hook as usual, when the camera and the place you are recording is under n ormal temperature. In very high speed set´s, the temperature is very light and this will effect the backfocus. If so, do not measure the distance anymore, do the focus by eye on the monitor.

PREPARATION

Connection Chart



Control Unit

1. Open side doors of the Control Unit
2. Connect Control Unit monitor with DVI 1 out (internal monitor) at the left side.
3. Connect GRAPHIC CARD OUT with GRAPHIC CARD IN at the Control Unit with the S-Video cable.
4. Plug in and turn on the Control Unit
   ➔ If not possible, check power cable and connection

5. Connect Control Unit “Main IEEE 1394” with Camera “IEEE 1394” with a Firewire cable. If the distance is more than 4,5m (standard Firewire cable) or 10m (special Firewire cable for distances up to 10 meters), you have to use the FOL cable.
   ➔ For “OPTICAL” connection: Bridge “Main IEEE 1394” with one of the two “IEEE 1394 (bridge to Main IEEE 1394)” at the top and leftside from the “OPTICAL” plug. Then plug the Fibre Optical cable into “OPTICAL” on the camera’s back and into the control unit. Both green lights are supposed to light up now. The Control Unit is then connected through Fibre Optical cable with the camera.
   ➔ Fibre Optical cables are very sensitive. Never bend or fold them, do not step on them. Clean the ends very carefully and only special cleaning liquid for Fibre Optical Connectors. Always put caps onto the connectors, when you do not use them.
   ➔ Do not bridge the “Main IEEE 1394” with one of the two “IEEE 1394 (backup)” plugs. These are for backup use in case the “Main IEEE 1394” is out of order.

6. Layout the cables with a savety catch to prevent accidents.

7. Make sure, NVIEW of your graphic card is active and it is set on “Clone”
   ➔ Get familiar with the massive tools of your NVIDIA graphic card
   ➔ The “cloned” picture will be visible in the viewfinder and all additional monitors.
   ➔ There will be no signal on DVI 2 if GRAPHIC CARD OUT is connected.
   ➔ If you have enough experience with the graphic card, you can also put the NVIEW Modus to “Dual View” and send the Preview picture to the viewfinder and all additional monitors. Be aware, that you will need two monitors for yourself to operate.

8. Connect the “Video out” connector of the CONTROL UNIT with “Video in” connector of the CAMERA with a BNC 75 Ohm cable and use strain relief or tape cable to prevent connectors from breaking.
   ➔ The “cloned” picture will be in the viewfinder and all additional monitors.

9. Connect additional monitor at “Video out” connector if needed. They are supposed to be PAL / NTSC monitors, no HD monitors.

10. Load “calibration charts” from NVIDIA graphic card “Tools” and calibrate viewfinder and all connected monitors.

Camera

1. Put the appropriate lens mount on the camera (PL-Mount, Nikon F-Mount etc.)
2. Provide the appropriate adaptor plate for the tripod
3. Put a battery onto the camera not to loose data in case someone unplugs the camera.
4. Plug in and turn on CAMERA
5. Wait till you see two green lights (power and camera) lit at the back of the camera. The camera is now ready to shoot. If you get a different blinking signal, please refer to the following interpretation of the flash code of the two LEDs on the camera:

Camera LED:

_ Flashing orange/off >> camera not ready (appears on camera start up)
_ Steady green >> camera ready
_ Steady orange >> recording/live previewing

Power LED:

_ Flashing orange/off >> power supply not ready (appears on camera start up)
_ Flashing red/orange >> impressed voltage too high (above 16 volts)! RISK OF DAMAGE. Please change power supply!
_ Flashing green/orange >> impressed voltage slightly too high (between 15 and 16 volts). No problem for shot time. Appears mostly for about 5 minutes, when a completely charged battery is attached to the camera.
_ Steady green >> impressed voltage within the operating range (between 10.8 and 15 volts); power supply ready
_ Flashing orange/off >> impressed voltage low (between 10,8 and 10,4 volts). When you are using batteries, please change it now!
_ Flashing red/off >> impressed voltage very low (below 10,4 volts). Camera is in sleeping mode in order to prevent damage. The ventilator keeps on running to cool down the camera. RISK of damage of IDE batteries!

IMPORTANT:

To reactivate the camera please change the battery and switch the camera OFF and ON again. All data of the cameras memory is erased!

6. Load "calibration charts" from NVIDIA graphic card "tools" and calibrate viewfinder and all connected monitors.

Hand Unit

1. Connect the Hand Unit with the camera. Use only the cables delivered by P+S Technik.
2. Mount the Hand Unit on the camera with the delivered brackets, if needed.
3. Turn on the Hand Unit
   The green LED ***STANDBY*** lights up
   -> If ***REC*** is lighting, press the green ***Start / Stop*** button to turn the Hand Unit into ***STANDBY*** mode
   -> If the blue ***LIMITS*** LEDs lights up, erase the limits and turn the Hand Unit into ***STANDBY*** mode.

Hand Unit Settings

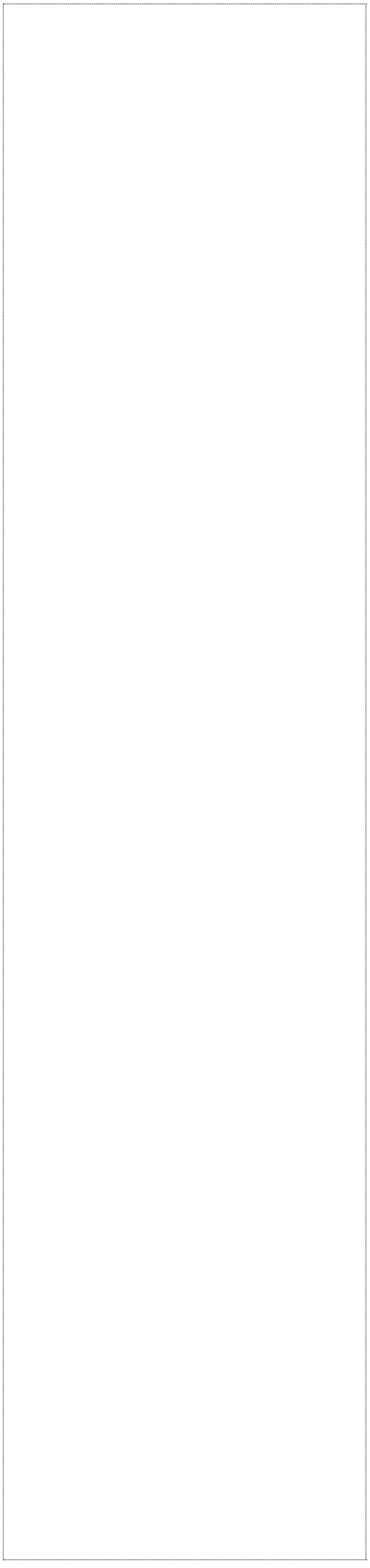
P - Records while green ***START / STOP*** button is pushed down
L - Set and erase Limits
C - Continous recording after green ***START / STOP*** button is pushed once, push again to stop recording

-> *To set Limits*

1. Move the Limit Stops to the appropriate positions
2. Turn the wheel to Limit 1
3. Press the blue ***SET LIMITS*** button until the blue light is lit continuously.
4. Move the wheel to Limit 2
5. Press the blue ***SET LIMITS / JUMP*** button until the second blue light is lit continuously.
   You now have set your Limit 1 and Limit 2. A limit can be the one with the higher value, for ex. Limit 1 is 500 fps and Limit 2 is 100 fps - just set the higher value first.
6. Set the Hand Unit Program Switch to ***C*** for continuous recording
7. Press ***START*** and you are now recording with the fps of Limit 1
8. Press the blue ***SET LIMITS / JUMP*** and the recording speed jumps to the frame rate set for Limit 2 and records in this speed until you release the blue button.
9. Release the blue button and you are now recording again with the frame rate set for Limit 1
10. Press ***START / STOP*** to stop recording

-> *To Erase Limits*

1. Switch the Hand Unit Program Switch to ***L***
2. Press ***SET LIMITS*** until the blue LED for Limit 1 is lit continuously
3. Press ***SET LIMITS*** again until the second blue LED for Limit 2 is lit continuously
4. Release the ***SET LIMITS*** button and the two blue LEDs will turn off and the Limits are erased
5. Switch the Hand Unit Program Switch to ***C*** or ***P***



SOFTWARE

Note: This software will be updated soon!

The new software contains many film like tools as* Safety Zones*, 10bit DPX files rendering with header information, auto* Slate *functions, easy* CUT IN *and* CUT OUT *settings with* AUTO SAVE*, up-to-date color algorithms etc. And also the download time will be shorter than it is at the moment. You will be able to directly input the fps and shutter settings without delay, etc.

Installation

We recommend the following settings for the software installation:

- Make sure the operating system is adjusted for best performance (➲Control Panel ➲System ➲Advanced ➲Performance ➲Settings)
- Install the following software packages (on the WEISSCAM software CD or on Partition D:\ of your WEISSCAM Control Unit)

> Quicktime / iTunes
(➲"iTunesSetup")

> Windows Media Player
Version 10 (➲"MP10setup")

> WEISSCAMware
(set all options and ignore error prompts)
A shortcut will be created automatically onto the desktop

> WEISSCAM_Branding
After installation of the WEISSCAMware has been finished, copy the files of the directory "WEISSCAM_Branding" into your installation directory (c:\ProgramFiles\Digital Camera Toolbox)

> FrameCycler
Install "FrameCycler" by copying the whole directory "FrameCycler" from the CD or software directory into "c:\Program Files\" and create a link to c:\Program Files\FrameCycler\bin\FrameCycler.exe" from your desktop. Create an empty folder named „notebook.iridas" on every harddisk of your laptop.
IMPORTANT: You need to buy a new license for FrameCycler (www.iridas.com), since the software is bound to the hardware!

> Hotfix KB 885222

In order to adjust the Firewire connection, please run the WINDOWS Hotfix “KB 885222”.
Please note: the Hotfix on the WEISSCAM Installation CD is for systems with English installation language only!
If you use a copy of WINDOWS XP based on another installation language please download the corresponding file from http://www.microsoft.com (search for “KB 885222).
If you receive an error prompt the first time, you are trying to install the hotfix, just try again – it should work the second time.

> After you installed the Hotfix, open the file named pco_kb885222.zip on your Weisscam Software CD
Read the PDF file “Install KB885222” thoroughly !
Then run “PCO_KB885222.exe”.
IMPORTANT: If you attach another Firewire Card to your system after the installation process, you will have to run this application again.

- Install the camera to the system
  > Plug the camera to the running computer and switch on the camera
  > Follow the prompt and install the “WEISSCAM Driver” (on your WEISSCAM Installation CD)
  > Run a test together with camera and the new computer setup.
  > Thoroughly test run the new system: Do all features work fine?

Now your Weisscam Control Unit is ready to work !

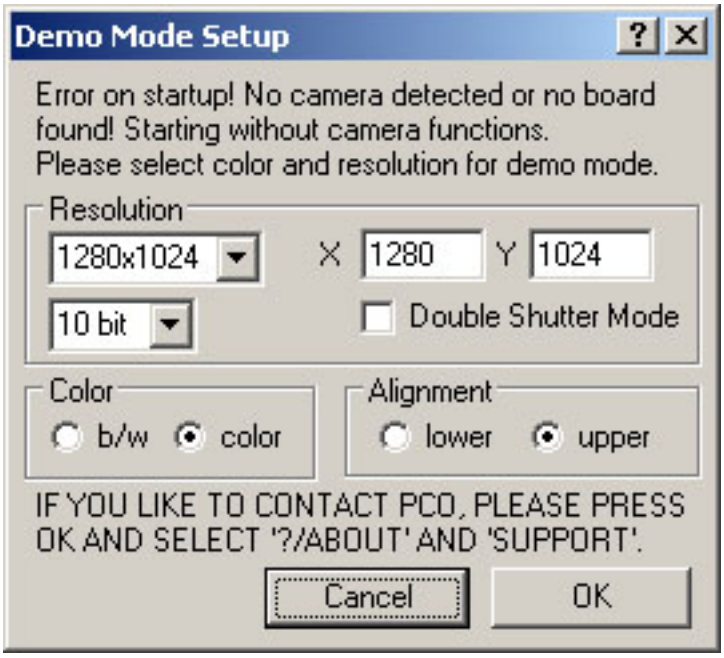
All software components are on the CD called
WEISSCAM Software and Drivers
Article No. # 22136

Start Software

Start Software

Double click on the icon WEISSCAM on the desktop.
The software will open up and find the camera automatically.

If ***Demo Mode*** starts, try the following steps:



1. Check if camera is still turned off. Turn on camera and restart software.
2. Check Firewire / FOL connection, turn off and on the camera and restart software.
3. Check if the software is already open in background. It is only possible to work with one alias of the software. Close the second software window and work with the window, which is already open.

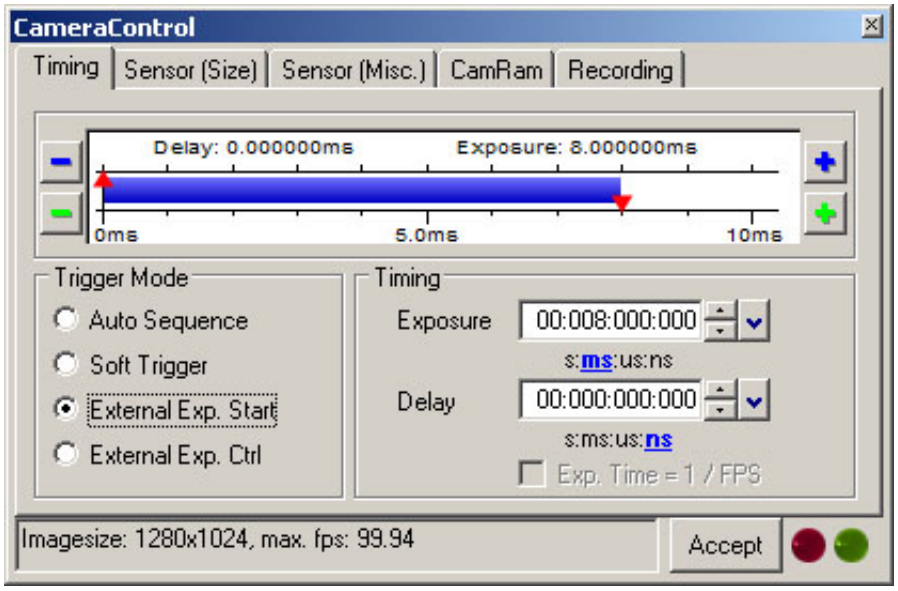
Window : View Color

Click on the icon View Color. You now told the camera, you want to work with color view. There is an option to work with black and white view, but you normally do not need this function. The color window is your main picture. All image settings like gamma, white balance, focus etc. is controlled in this window.

- Top left of the window shows ***Color Window***.
- There is no live picture so far !!!

Window : Camera Control

Click on the icon “Camera Control”. In this window, you control everything from sensor size, exposure time, trigger mode to segments size...
Important: Please always confirm your setting by pressing the ***ACCEPT*** button.
To prepare the camera for the shot, do the following steps:



1) Timing

Choose the desired speed rate and exposure time
(see “EXPOSURE TIME TABLES”) and the trigger mode.

Trigger Modes:
➔ ***Auto Sequence:*** for software trigger and exposure time and frame rate by hand. In this mode auto max. fps with 1/FPS is possible.
➔ ***Soft Trigger:*** for software trigger and exposure time and frame rate by hand. In this mode auto mix fps with 1/FPS is **not** possible.
➔ ***External Exp. Start:*** for Hand Unit trigger and exposure time by hand and frame rate by Hand Unit
➔ ***External Exp. Control:*** for Hand Unit trigger and exposure time and frame rate by Hand Unit (not usable because T-Stop is 1/ fps)

➔ You just need either ***Auto Sequence*** or ***External Exp. Start***
➔ If you are in ***Auto Sequence*** and press the ***Exp. Time = 1/FPS*** and the system automatically calculates the max. fps regarding your image size !
➔ You just need ***Delay*** when you want to shoot with a shorter Exposure time than your frame rate!

2) Sensor (Size)

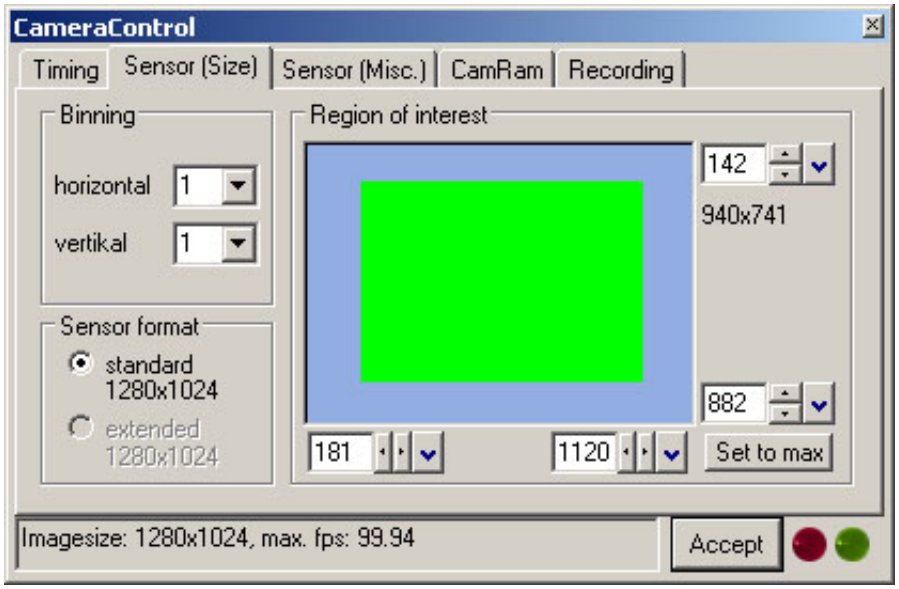
- Choose ***Region of interest (ROI)*** by dragging the mouse to the frame size you want.

- Fine-tune the size with the small arrows next to the numbers. The ROI is shown on the right side next to the sensor field.
  -> Horizontal steps are possible in steps of ten units
  -> Vertical steps are possible in steps of one unit

- Press ***Set to max*** if you want to record with the full sensor.

- Press ***Accept*** to save your changes to the ROI.
  -> ***Attention:*** You are recording square pixel! HD are square pixel, but PAL and NTSC are NON square pixel! Discuss this fact with your Post Production before choosing the Sensor Size.

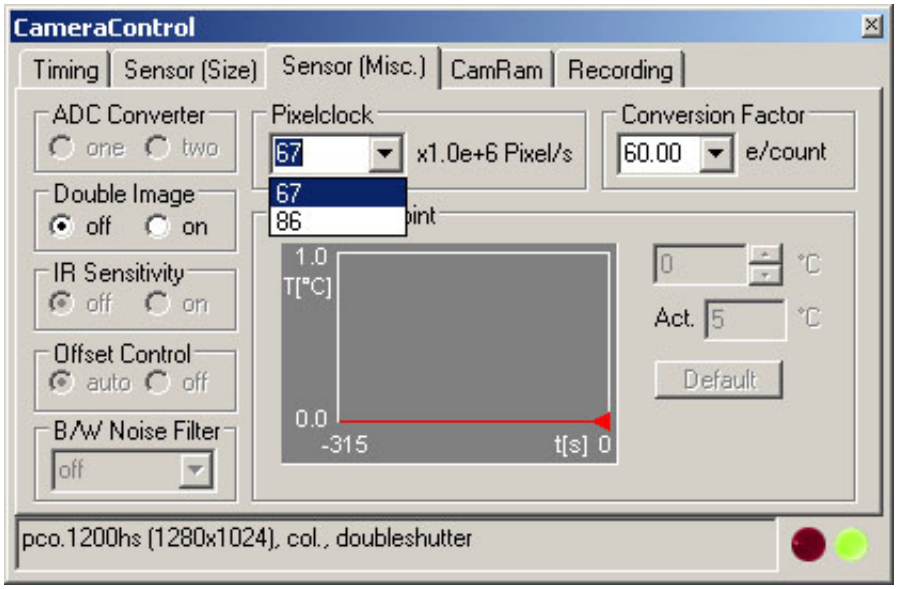
- 1280x720 for HD (you can put 304 and 152 in the fields at the right side)
- 720x576 for PAL and Crop factor 1,06
- 768x576 for PAL you have to use 770x576 no crop factor, up to your post
- 1020x576 for PAL 16:9 (discuss with post)
- 720x432 for PAL 16:9 (discuss with post)
- 640x480 for NTSC
- 844x691 for PAL + 20% (has to be 840x690)



3) Sensor (Misc.)

Choose Pixelclock

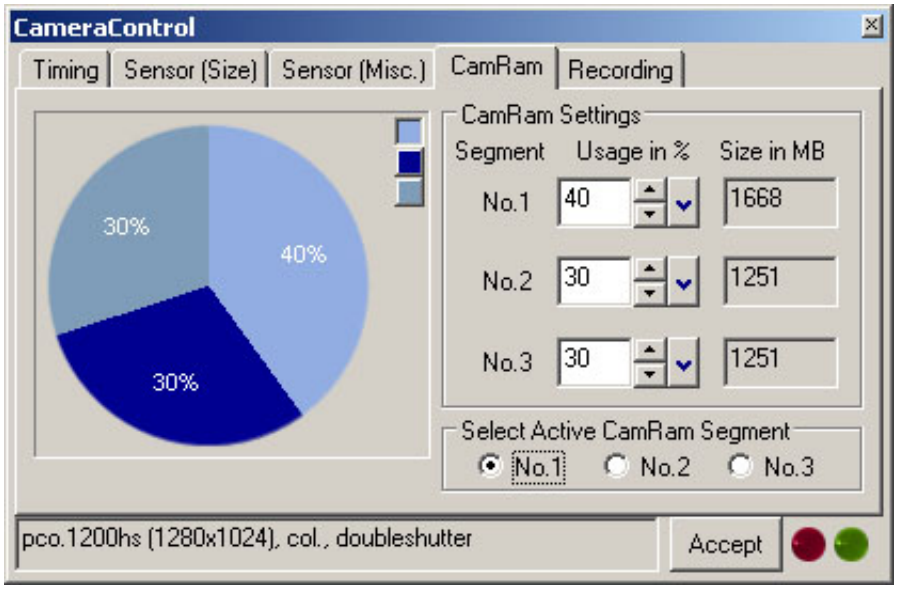
- Pixelclock 67 for lower speeds till ca. 500 fps and slightly better quality.
- Pixelclock 86 for higher speed.
  Caution: Camera heats up faster!



4) CamRam

Select segments
Maybe neccessary for motion control shots

-> *Use smaller segment for low resolution to have less preview time!!!*



5) Recording

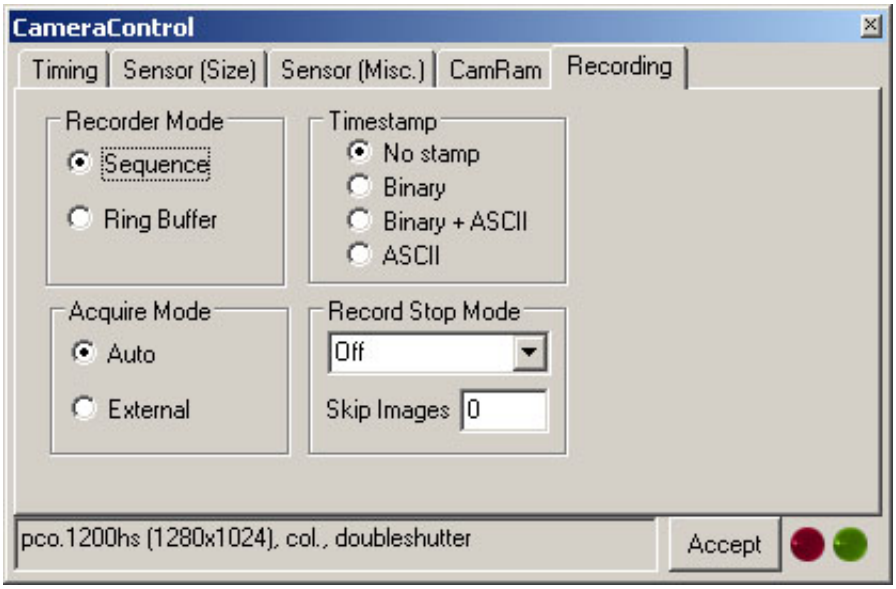
Recommended setttings:

Recorder Mode
- ***Sequence*** for START / STOP
- ***Ring Buffer*** for continuous recording and stop per trigger

Acquire Mode
- ***Auto*** for normal recording
- ***Do not*** activate ***External***

Timestamp
- ***No Stamp***

Record
- Stop Mode ***Off***



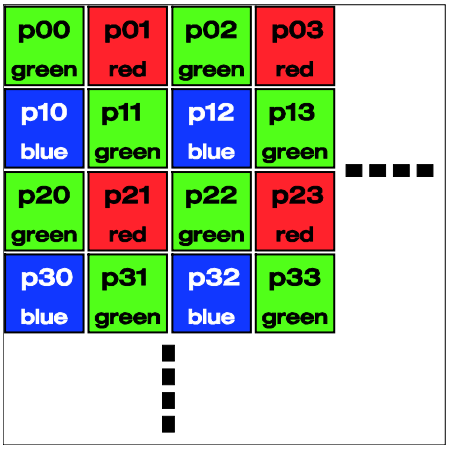
➔ You just need ***Sequence*** or ***Ring Buffer*** in this window

➔ **Status Line:**
One mouse click in the status line shows the temperature. Don´t go higher than 60°C for EI. Temperature and 65°C for Power Temperature! Second mouse click in the status line, shows the choosed image size and the frame rate.

Window : Options

Color algorithm

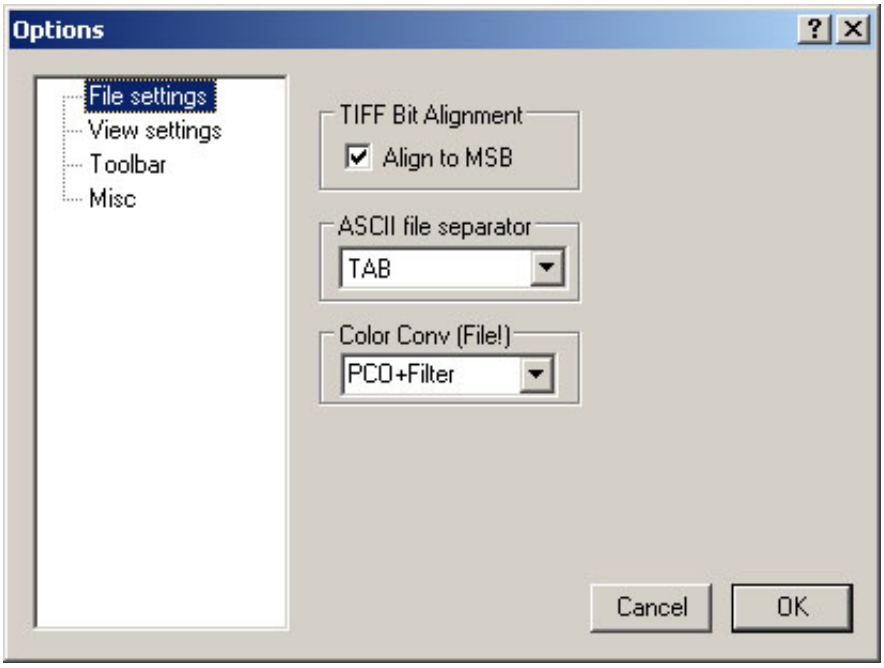
The camera has a single CMOS sensor with a Bayer pattern on the sensor. This Bayer pattern is a color matrix.



To receive the required color scheme you need a color algorithm. You can work with different color algorithms and separate the ***Viewing*** color algorithm from the ***File / Saving*** algorithm.

To prepare the camera to shoot with the proper color algorithm, following these steps:

1. Go to menu ***File*** and then ***Options***
2. Go to ***File settings***



Choose Color Conv(File!) for saving

-> S***mooth*** for softer images and fast rendering (used for gradient images)

-> ***Smooth+Filter*** for softer images and slower rendering, but with a reduced mosaic effect.

-> ***PCO*** for crispy images and normal rendering (used for liquids, sports)

->***PCO+Filter*** for the highest quality, crispy images and slower rendering, with a reduced mosaicing effect. This is the algorithm you should use, if you have got the time……

-> If you have incorrect coloring, you have to activate the color conversions in "View settings" and "File settings; otherwise the camera uses no color algorithms and creates these incorrect coloring.

Recommended settings for

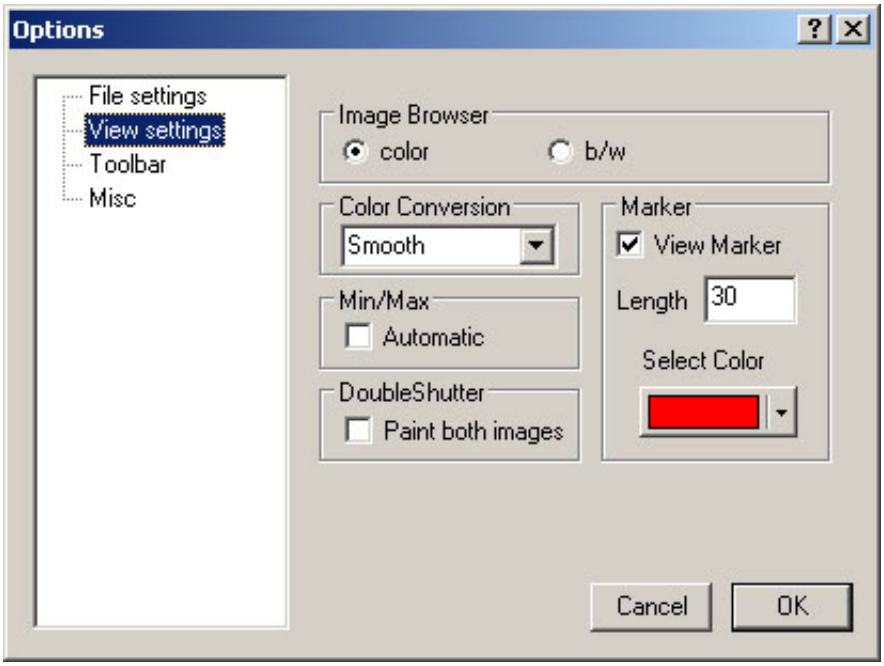
TIFF Bit Alignment

- Align to MSB ***Off***

ASCII file separator

- ***TAB***

3) Go to ***View settings***



Choose ***Color Conversion*** for preview

- ***Smooth*** for a fast and smooth preview and live picture
- ***PCO*** for a crisp, but a little slower preview and live picture

If you choose PCO or PCO+Filter color algorithm, the preview will not run smoothly

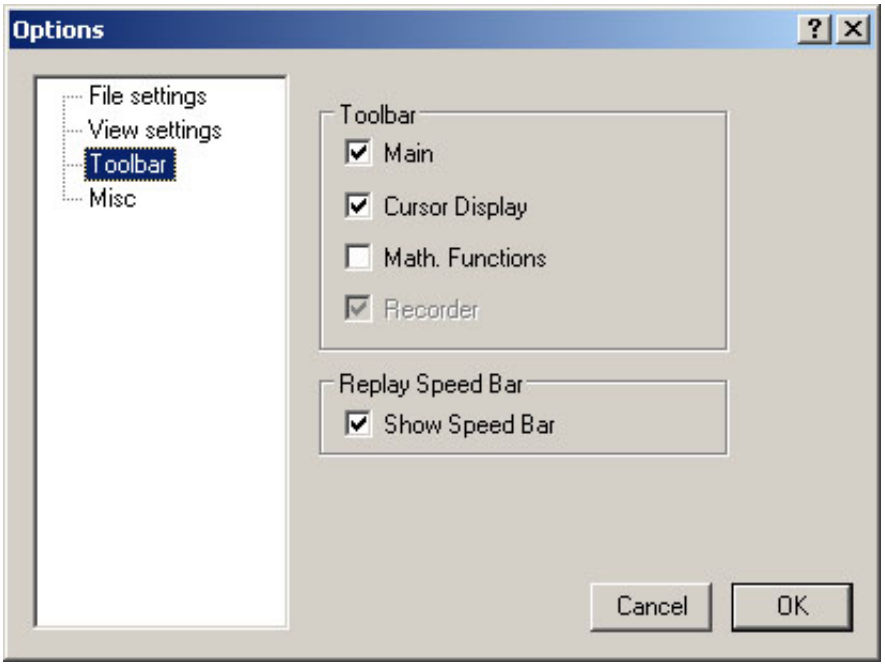
Run the following settings:

- View Marker ***ON***, if you want to work with a center mark
- Min/Max Automatic ***OFF***, this function is not necessary
- Double shutter ***OFF***, only relevant for long time exposures

4) Go to ***Toolbar*** and set the following:

- Main ***ON***
- Cursor Display ***ON***
- Math. Function ***OFF***
- Recorder ***ON***
- Show Speed Bar ***ON***

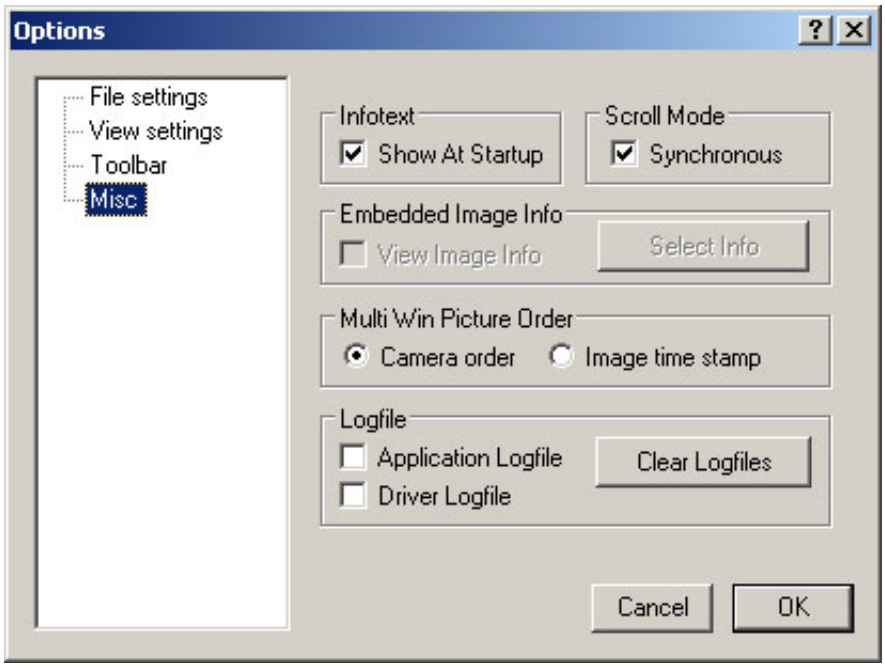
➔ If the Speed Bar is ***OFF***, you cannot control the playback speed !



5) Go to ***Misc.***

Recommended settings:

- Infotext ***OFF***
- Scroll Mode ***OFF***
- View image info ***OFF***
- Camera order ***OFF***
  Image time stamp ***OFF***
- Application Logfile ***OFF***
  Driver Logfile ***OFF***



Window : Live Preview

1. Press ***Live Preview*** to see the live picture. Top left of the window shows ***Preview***
   _ Optimize the window size by zooming (right mouse click) and dragging the window
   _ Optimize focus and t-stop

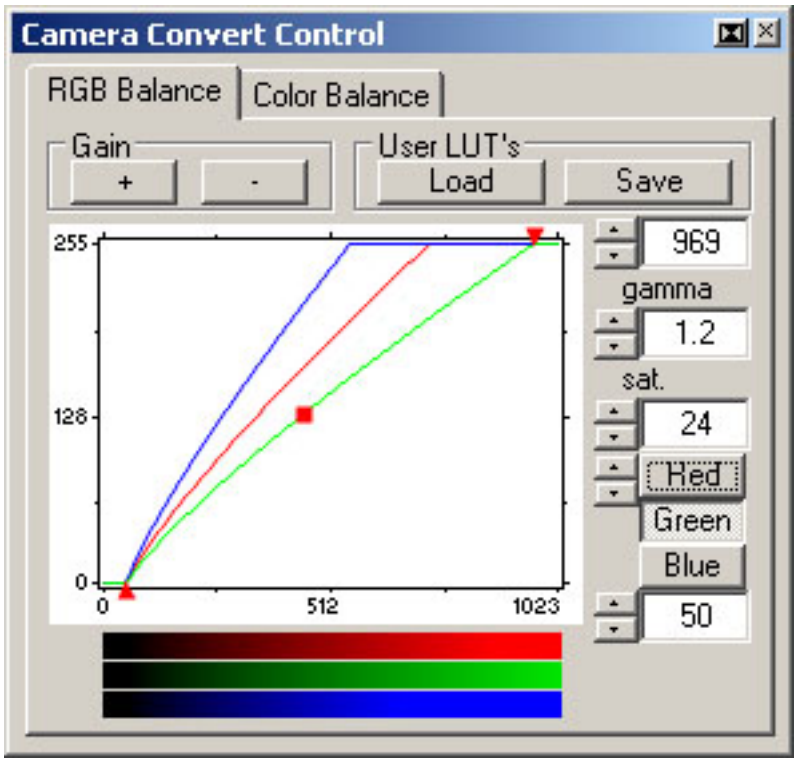
2. Press ***Live Preview*** again to get a freezed image and do the white balance adjustment

   ➔ If the "Live Preview" is too slow for your taste, then work with freezed frames when changing white balance, speed rate or exposure time.

Window : Camera Convert Control

Set your ***White Balance*** in this window

1. Open window ***Convert Control Color***
   -> If you are in ***Live Preview*** or ***Recoding*** mode the changes may react slowly, because through Firewire information can only be send in one direction at a time.



Use ONLY RGB Balance. Do not use Color Balance.

Check if ***Gain*** value is down. ***Gain*** affects all three RGB curves at the same time. Use ***Gain*** carefully and no more than two steps, it's better to use more light sources. High Gain values will increase noise in the image.

Find the appropriate white balance with moving the RGB curves carefully with the little red arrow at the top of the curves. The little red arrow at the bottom of the RGB curves should not to be below 25.

Check your white balance by moving the cursor into a white area in the image and control the RGB values in the main window's status line. They are fine if the three colors have about the same values.

You can try AUTO White Balance, but normally the result is not satisfying. Results are better if adjusted manually.

Depending on the recorded image you have to change the gamma, but do not go above 1.5 Gamma. For black backgrounds, it may help to change the gamma to 0.8.

To create better color, raise the saturation. Do not go higher than 26. Post production have more possibilities to do color correction.

After finishing your white balance adjustments, save this as a LUT file with the project's name. You can easily load this LUT again. You just have to control the saturation again.

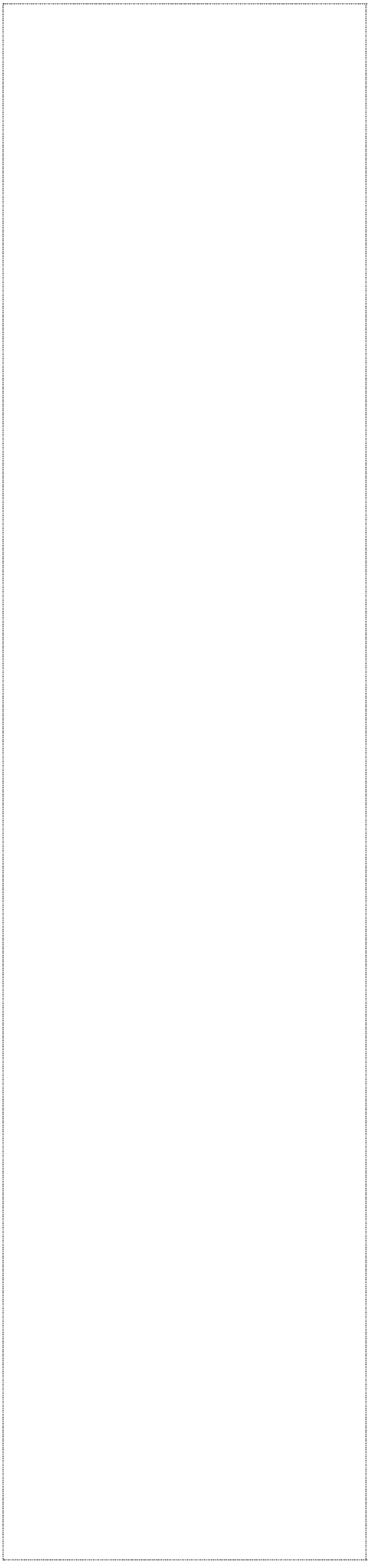
The Camera and the Control Unit are now ready to shoot !!!

Image Control:

➔ Control the whole image. Remember, you shooting digital! That means: Soft lighting. The image is supposed to be lit within 5 T-stops. If the high lights are too burning then there will be no detail.

➔ Always move the cursor over the whole image and check the RGB values. If they are all 255, then this area is burning and has no details. If they are all 0 then there is no information at all, and the post will not have the chance to do anything with it.

➔ If you see burning areas, or areas in black without any values, tell it to the DoP and Director. It is very important , that you support them, because the DoP may light for Film.



RECORDING

Software Triggering

1. Check your image size, frame rate and trigger details in Window ***Camera Control*** by clicking three times in the status line of the ***Camera Control*** Window.

2. Choose Trigger Mode ***Auto Sequence*** or ***Soft Trigger***.

3. Choose Recording Mode ***Sequence*** or ***Ring Buffer***.

4. Press the red Record Button. The lever turns and the CamRam Level Indicator is filling up.

   -> In Recording Mode ***Ring Buffer*** the CamRam Level Indicator will fill up once and stay full till stop signal. If you stop too early, you do not have recorded the full 4 GB RAM ! Always wait until the indicator is full.

5. Press the STOP button . The sequence is now recorded and stored in the RAM of the camera. The total amount of recorded images is showed in the status line. Make sure, it is never over 10.000 frames, because you cannot save more than 9.999 frames! For previewing and saving, please go to Chapter: ***PREVIEW AND SAVING***

   -> ***ALL IMAGES WILL BE LOST IF YOU PRESS THE RED RECORD BUTTON AGAIN***

Hand Unit Triggering

-> Detailed information for adjusting the Hand Unit see ***Hand Unit***

1. Make sure, the Hand Unit is connected to the camera and both are turned on.

2. Check your image size, frame rate and trigger details in Window ***Camera Control*** by clicking three times in the status line of the "Camera Control" Window.

3. Choose Trigger Mode ***External Exp. Start*** to trigger from the Hand Unit.

4. Check status line to see the max. frame rate.
   ➔ Triggering from the Hand Unit reduces the max. frame rate, because the Camera has to work with additional external signals and therefore need more time.
   ➔ Reducing the exposure time increases the max. frame rate.

5. Choose Recording Mode ***Sequence***. This mode will stop the recording automatically, when the 4GB RAM inside the camera is full.

   ➔ When using the Recording Mode ***Ring Buffer***, the camera will overwrite the images until you stop the recording with the Hand Unit.

5. Press the red Record Button  in the software. A yellow lighting bolt symbol appears. The camera is now waiting for the trigger signal from the Hand Unit. You do not have a live picture at this moment. As soon as the recording starts, you will see the live recording picture.

   ➔ To get a live picture, you may stay in Live Preview and change to record, just before recording, or you record with 25 fps and jump at the desired frame rate when needed.

   ➔ ***Do not*** press the yellow lighting bolt button  next to the red recording button !

6. Press the green START / STOP button on the Hand Unit. The lever turns and the CamRam Level Indicator fills up.

7. After you stopped recording with the Hand Unit, press the stop button  in the software, otherwise the Control Unit does not know that the recording is finished.

8. The sequence is now recorded and stored inside the RAM of the camera. The total amount of recorded images is showed in the status line.
   ➔ Make sure, it is never over 10.000 frames, because you cannot save more than 9.999 frames! For previewing and saving, please go to ***PREVIEW AND SAVING***

➔ ***ALL IMAGES WILL BE LOST IF YOU PRESS THE RED RECORD BUTTON***

PREVIEW AND SAVING

Preview

➔ Check the whole image carefully. Is the image in focus? Do you see burning areas or hot spots, do you see a horizontal stripes caused by a very hard light. Is the gamma correct, is the saturation not too high and not to low etc.
This check is very important, you have to check it all the time!

1. Press the green PLAY button  ***(make sure, you do not press the red Record button….)***

2. Change Preview Speed by moving the marker of the Speed Bar  to the right (faster) or to the left (slower).

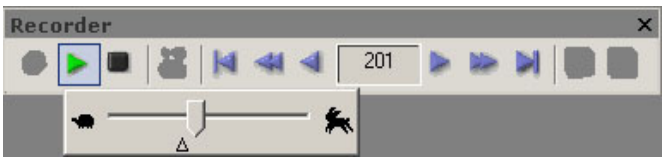
   Set the speed to approximately 25 fps for normal review.

   ➔ If there is no speed bar, please check under ***File > Options > Toolbar*** if ***Show Speed Bar*** is active ! 

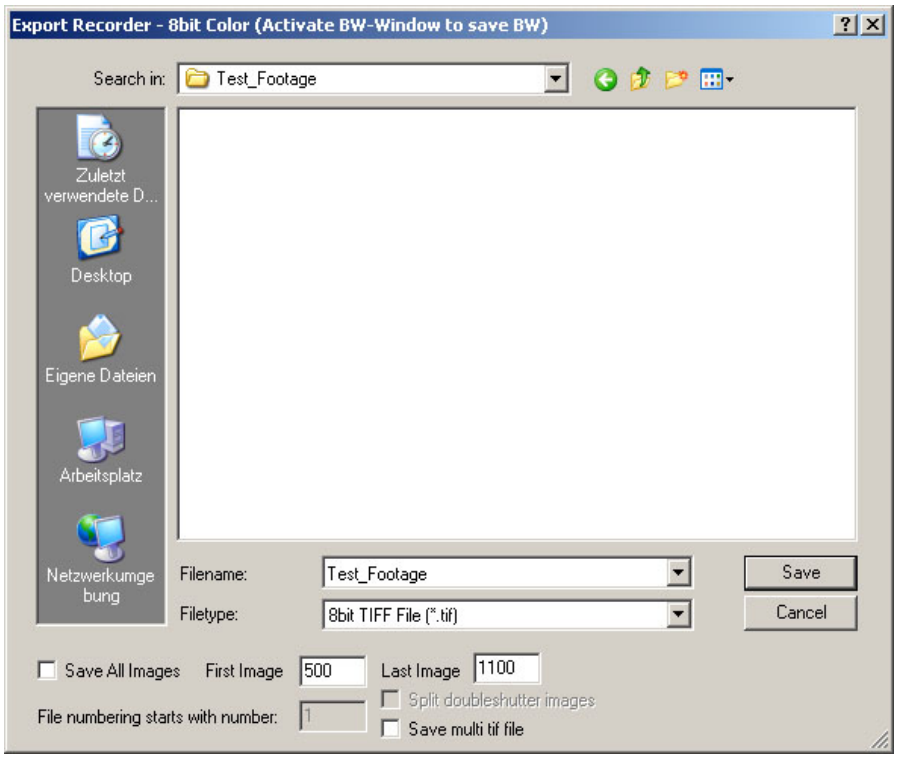
3. Use fast forward and fast backward to reach the desired part of the recorded sequence.

4. Playback speed at 25 fps allows you to carry out a visual check. To control recorded frame rate.

5. Write down the Cut in and the Cut out points of the sequence. Give a few more frames at the beginning and at the end.



Saving



1. Go to “File” > “Export Recorder”

   ➔ Make sure you choose the right color algorithm in ***File*** > ***Options*** > ***File Settings***, ***Color Conv***. for shooting. You cannot change it after downloading from the camera. If needed, you have to download the sequence again with the appropriate color algorithm.

2. Create a new folder, name it and open it

   ➔ You have two hard disks in your Control Unit. One is an internal hard disk, which has two partitions. Partition one C:***SYSTEM*** is for programs and partition two ***DATA*** is for data storage. Use the partition D:***DATA*** for saving your files. The second hard disk E:***REMOVABLE*** is removable and has no partitions. This could be your safety or customer copy. But check first with your client, if they want a USB 2.0 external hard disk or a removable hard drive.

3. Write down a file name (which is always the name of the folder)

4. Deactivate ***Save all images***

➔ If you forget to deactivate ***Save all images***, the Control Unit will save all images and that will (depending on the used color algorithm) take a very long time. You can stop the down loading by pressing ***ESC*** and save it again with the right Cut in and Cut out.

5. Write in ***first image*** and ***last image*** from your list.

➔ Double-check the ***first*** and ***last image***. If the first image of the new sequence is bigger than the last image of the old sequence, the Control Unit takes a minimum and this can become a very long sequence. If you have the feeling, the download time is to long, this might be the reason.

6. Carefully choose the file type. 8 bit-tiff uncompressed gives you the best quality. You may prefer avi files with uncompressed full frames, but you have to check this with your customer in advance. Do not save MPEG files, because it takes additional download time.

➔ Do not use the 16 bit FITS or the 16 bit ASCII or other formats, the post production cannot read them!
These are internal formats.

7. Press the ***SAVE*** button.

8. Press the ***YES*** button, because you are saving 8 bit data.

9. Now the download starts. You can see the progress in the status line (bottom left)

10. After the download process finished, the downloaded sequence is on your hard disk. You can either download a second part of the sequence in the camera's RAM or press the red record button and record a new sequence.

➔ After you pressed the red record button, all data in the RAM of the Camera will be erased.

Playback of Saved Files

1. Open the software ***FrameCycler*** (icon on desktop) and load the saved file you want to work with.

2. Play the sequence. If you need to see full frame, turn ***Resample off***.

   ➔ Do not copy in the background, when watching the sequence with FrameCycler. It will slow down the playback speed.

   ➔ Learn all shortcuts of Framecycler, it helps a lot and it is very fast….(Short Cut table can be found in the reference part of this guide book)

   ➔ Learn more about the software, you can show color correction, vector scope etc.

More information can be found in the reference part of this guide book or contact P+S Technik by email to info@pstechnik.de

Safety Copy / Data Transfer

1. Connect the external hard drive to the USB2.0 connector of the Control Unit.

2. Make a copy of all recorded files, whenever you have time. It is not good to do the safety copy at the end of the day (the risk of lose your footage is too high and everybody understands that you need a little time for the safety copy.

3. The Control Unit has a removable S-ATA hard drive. Check with your client in advance, if it is possible to exchange data with them (using the WEISSCAM hard drive). The internal safety copy would be faster than a copy to an external USB2.0 hard drive. But you need to know how they want to handle their data and if they can read a S-ATA hard disk. If your client has no slot for a removable S-ATA disk, you may buy a USB2.0 or Firewire case for the S-ATA hard disk or ask if they have a slot for the S-ATA hard disk.

EXPOSURE TIME TABLES

Because you cannot enter the fps directly, you have to type in the exposure time. The exposure time is always the same, no matter if you choose PAL, HD or Full Sensor. Up to your pixelclock 67 or 86 you can reach different fps in highspeed depending to the image size.

➔ In digital highspeed you do not have a film shutter angle of 180° or 72°. You actually record with 360°. That means, to shoot 250 fps, you have to have a shutter of 1/250 !
➔ Press "Ex. Time = 1/ FPS" to see the max. possible frame rate with the chosen image size and pixelclock
➔ The smaller the image size, the higher the max. frame rate
➔ Reducing horizontal lines increases the frame rate, reducing vertical lines does not affect the frame rate.

Exposure time in ms digital	***Exposure time in film***	***FPS (360° Shutter)***
00:040:000:000	1/25	25
00:020:000:000	1/50	50
00:010:000:000	1/100	100
00:005:000:000	1/200	200
00:004:000:000	1/250	250
00:002:850:000	1/350	350
00:002:000:000	1/500	500 up to size and pixel clock
00:001:330:000	1/750	750 up to size and pixel clock
00:001:000:000	1/1000	750 up to size and pixel clock
00:000:500:000	1/2000	750 up to size and pixel clock
00:000:200:000	1/5000	750 up to size and pixel clock
00:000:100:000	1/10000	750 up to size and pixel clock
s : ms : us : ns		

Delay Exposure Time Tables

If you want to record 500 fps, but use a shutter of 1/1000, you first have to set the delay from this table and then add the desired Shutter / Exposure time.
In film language: You want 500 fps with a shutter angle of 180°. To reach this, you first have to set the delay from this table and then add the desired Shutter/ Exposure time.

- First check your pixelclock and resolution
- Chose the right delay time and type it in
- Add the right exposure time and type it in

- The delay is different and depends on the pixelclock and the frame size. (Remember: the exposure time is independent from pixelclock and frame size)
- The exposure time plus the delay time cannot be longer than 1/fps.

Delay at 1280x1024 pixel

FPS	*Delay at pc 67*	*Delay at pc 86*	*Exposure*
25	00:037:950:000	00:038:430:000	add any Ex. Time < 1/25
50	00:017:964:000	00:018:433:000	add any Ex. Time < 1/50
100	00:007:964:000	00:008:433:000	add any Ex. Time < 1/100
200	00:002:963:000	00:003:433:000	add any Ex. Time < 1/200
250	00:001:964:000	00:002:434:000	add any Ex. Time < 1/250
300	00:001:297:000	00:001:767:000	add any Ex. Time < 1/300
400	00:000:464:000	00:000:933:000	add any Ex. Time < 1/400
500	00:000:000:000	00:000:434:000	add any Ex. Time < 1/500
650	-- : --- : --- : ---	00:000:000:000	add any Ex. Time < 1/650
	ss : ms : us : ns	ss : ms : us : ns	

Delay at 1280x720 pixel

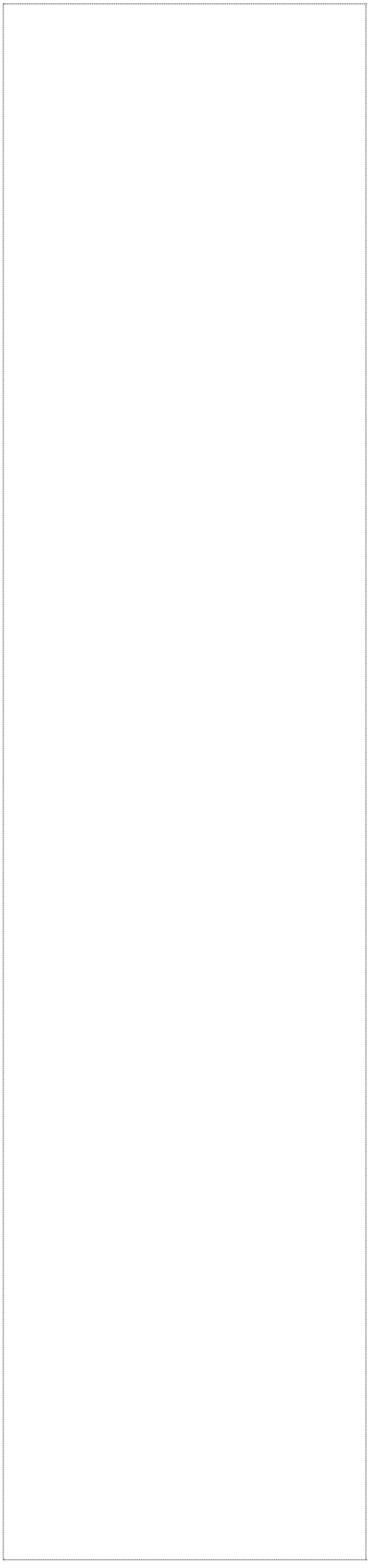
FPS	*Delay at pc 67*	*Delay at pc 86*	*Exposure*
25	00:038:555:000	00:038:890:000	add any Ex. Time < 1/25
50	00:018:562:000	00:018:890:000	add any Ex. Time < 1/50
100	00:008:587:000	00:008:896:000	add any Ex. Time < 1/100
200	00:003:587:000	00:003:896:000	add any Ex. Time < 1/200
250	00:002:430:000	00:002:897:000	add any Ex. Time < 1/250
300	00:001:760:000	00:002:230:000	add any Ex. Time < 1/300
400	00:000:930:000	00:001:396:000	add any Ex. Time < 1/400
500	00:000:587:000	00:000:897:000	add any Ex. Time < 1/500
700	00:000:016:000	00:000:325:000	add any Ex. Time < 1/700
900	--:---:---:---	00:000:000:000	add any Ex. Time < 1/900
	ss : ms : us : ns	ss : ms : us : ns	

Delay at 720x576 pixel

FPS	*Delay at pc 67*	*Delay at pc 86*	*Exposure*
25	00:038:850:000	00:039:110:000	add any Ex. Time < 1/25
50	00:018:850:000	00:019:115:000	add any Ex. Time < 1/50
100	00:008:850:000	00:009:115:000	add any Ex. Time < 1/100
200	00:003:850:000	00:004:115:000	add any Ex. Time < 1/200
250	00:002:851:000	00:003:116:000	add any Ex. Time < 1/250
300	00:002:183:000	00:002:449:000	add any Ex. Time < 1/300
400	00:001:350:000	00:001:616:000	add any Ex. Time < 1/400
500	00:000:851:000	00:001:116:000	add any Ex. Time < 1/500
700	00:000:280:000	00:000:544:000	add any Ex. Time < 1/700
870	00:000:000:000	00:000:265:000	add any Ex. Time < 1/870
1000	--:---:---:---	00:000:115:000	add any Ex. Time < 1/1000
1150	--:---:---:---	00:000:000:000	add any Ex. Time < 1/1150
	ss : ms : us : ns	ss : ms : us : ns	

Delay at 640x480 pixel

FPS	*Delay at pc 67*	*Delay at pc 86*	*Exposure*
25	00:039:030:000	00:039:250:000	add any Ex. Time < 1/25
50	00:019:038:000	00:019:260:000	add any Ex. Time < 1/50
100	00:009:040:000	00:009:260:000	add any Ex. Time < 1/100
200	00:004:040:000	00:004:262:000	add any Ex. Time < 1/200
250	00:003:042:000	00:003:262:000	add any Ex. Time < 1/250
300	00:002:374:000	00:002:595:000	add any Ex. Time < 1/300
400	00:001:541:000	00:001:762:000	add any Ex. Time < 1/400
500	00:001:041:000	00:001:262:000	add any Ex. Time < 1/500
700	00:000:470:000	00:000:690:000	add any Ex. Time < 1/700
900	00:000:153.000	00:000:373:000	add any Ex. Time < 1/900
1050	00:000:000:000	00:000:262:000	add any Ex. Time < 1/1050
1350	-- : --- : --- : ---	00:000:000:000	add any Ex. Time < 1/1350
	ss : ms : us : ns	ss : ms : us : ns	



TROUBLE SHOOTING

Message: Lost some plug'n' play camera
Reason: The connection between camera and control unit is broken
What to do: Check the cables and connectors for proper conneciton and damages, etc.
Check if the camera battery is charged and connected properly

Message: Error saving file
Reason: No more or not enough empty space on hard disk
What to do: Remove or erase old files or save in another place

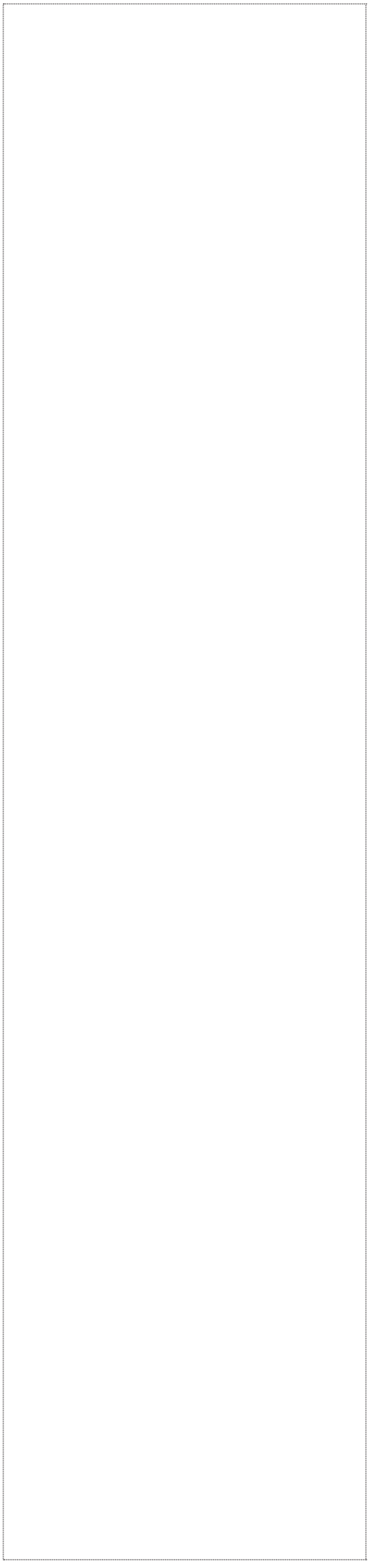
Message: Demo Mode starts
Reason: The connection between camera and control unit is broken
You opened the software to early, camera was not ready (two green lights)
What to do: Turn the camera off and on again, wait until green lights are lit and then restart the software.

Message: Demo Mode starts
Reason: Second WEISSCAMware is opened
What to do: Check if there are two Software windows opened. Close one window. The camera can only work with one software alias running.

Message: Demo Mode still starts
Reason: If the cable working and the connection functions properly, then the Firewire / FOL converter inside the control unit might not work.
What to do: If all other solutions failed, we advise to get in contact with P+S Technik immediately to discuss further steps : ***via phone +49-89-450 98 230 or email info@pstechnik.de***

The steps described in the following might be performed by an experienced technician, but P+S Technik does not take any responsibilty for damage caused to the Camera !
Plug the camera directly via Firewire cable onto the Firewire connector of the Control Unit (not into the converter). Turn the camera on and restart the software.
If it still does not work, then the FOL Converter inside the camera is out of order. Unplug the camera from power and akku pack. Disassemble the hand grip from the camera body. Unscrew 6 screws and remove cover plate. Unplug Firewire connection at the back of the camera head. Plug Firewire cable from the camera directly into the camera head. Tape the cover onto the open side, power plug the Camera, turn it on and restart the software.

Message: SCSI Driver problem
Reason: Cable connection is not proper
What to do: Check cable and restart software.



DOP STUFF

Light

When shooting high speed at 1.000 fps a lot of light will be needed, no matter if you do it on film or digital. The exact amount of light, depends on the kind of shoot. So this is a decision for the DoP, he needs to know, that the ASA is 160.

Flicker free

Never work with small lights like fluorescent Tubes, Kino Flo, Nessy Light, Mini/ Maxi Brute, Dino Light, Dedo Light, small HMI or Tungsten light sources. They normally flicker (Tungsten light is not flicker free !!!). Work with 10K or 20K Tungsten. The size of the light bulb gives you the security of not having a flickering in the image.

Regarding HMI: Work with 18K or mix 4 x 4 K´s to one main light. The mixing of the 4K´s will eliminate their single flickering.
So far, there is no ballast, which gives you a guarantee, that the light is 100% flicker free, no matter if they are old or new.

An additional advantage of the WEISSCAM HS-1 is that you can see and check the image on set in realtime, and see if there is a flickering or not.
You will see flickering always on radiant backgrounds, flat and / or big surfaces. If the flickering light is used as a top or a backlight, you may not see it flickering. Sometimes it helps, to focus the bulb in the parabolic mirror inside the lamp.

HMI or Tungsten

HMI supports the sensor of the WEISSCAM HS-1 as the light contains a great amount of blue, which is of advantage for the colors (CRI = Color Rendering Index). A HMI lit set does not heat up as much as a Tungsten lit set. But you still have to check the ballast and the flickering.

Tungsten light is less comforting for the sensor as the light contains a huge amount of red, therefore making the CRI very poor. Also the set becomes very hot. But you can be quite sure, that you will get a flicker free shoot, if you are using 10 K's.

Outdoor Shooting

On a sunny day, you will have no problems shooting outside. The sun gives you enough light to shoot with the frame rate you want and even change the shutter to a shorter time.
On a rainy or cloudy day, there will not be enough light to shoot with 1.000 fps. You may have to change to 500fps or less, additionally you can set up light sources.

Lenses

You can use all 35mm PL mount lenses. With the interchangeable P+S Technik mount system, you can easily switch between PL mount, Nikon F mount (delivery content). Additional mounts are available for the following lens types: Canon EF, BNC-R, Panavison, etc.

You cannot use B4 mount lenses, because the sensor of the WEISSCAM HS-1 is bigger than the 2/3” CCD chips in HD or SD cameras.

ASA

The ASA value of the WEISSCAM HS-1 is 160 ASA.

Depth of Field

The depth of field with WEISSCAM is longer than in 35mm film images and shorter than in 2/3“ video images.

Near limit (dn) of acceptable sharpness in millimeter

$$d_n = \frac{d \cdot \frac{f^2}{T_{stop} \cdot 0,015}}{\frac{f^2}{T_{stop} \cdot 0,015} + (d - f)}$$

Far limit (df) of acceptable sharpness in millimeter

$$d_f = \begin{cases} \dfrac{d \cdot \frac{f^2}{T_{stop} \cdot 0,015}}{\frac{f^2}{T_{stop} \cdot 0,015} - (d - f)} & \text{wenn } \dfrac{f^2}{T_{stop} \cdot 0,015} > (d - f) \\ \infty & \text{wenn } \dfrac{f^2}{T_{stop} \cdot 0,015} \leq (d - f) \end{cases}$$

d: distance in millimeter
f: focal length
TStop : TStop
Used circle of confusion: 0,015

Crop Factor

If you work with 35mm PL mounted film lenses or with still photography mounted lenses, you have to calculate with different crop factors. Here are the different diagonals:

Source	Image Size	Diagonal
35mm film	24 x 18 mm	27,5 mm
WEISSCAM HS-1 sensor	15 x 12 mm	19,5 mm

For 35mm PL mounted lenses you have to multiply the focal length with a factor of 1.4. This is based on full sensor use.

- a 50mm film lens is approx. a 70mm lens on the WEISSCAM HS-1
- a 50mm still photography lens is approx. a 70mm lens on the WEISSCAM HS-1

The normal focal length lens for WEISSCAM HS-1 is 25mm.

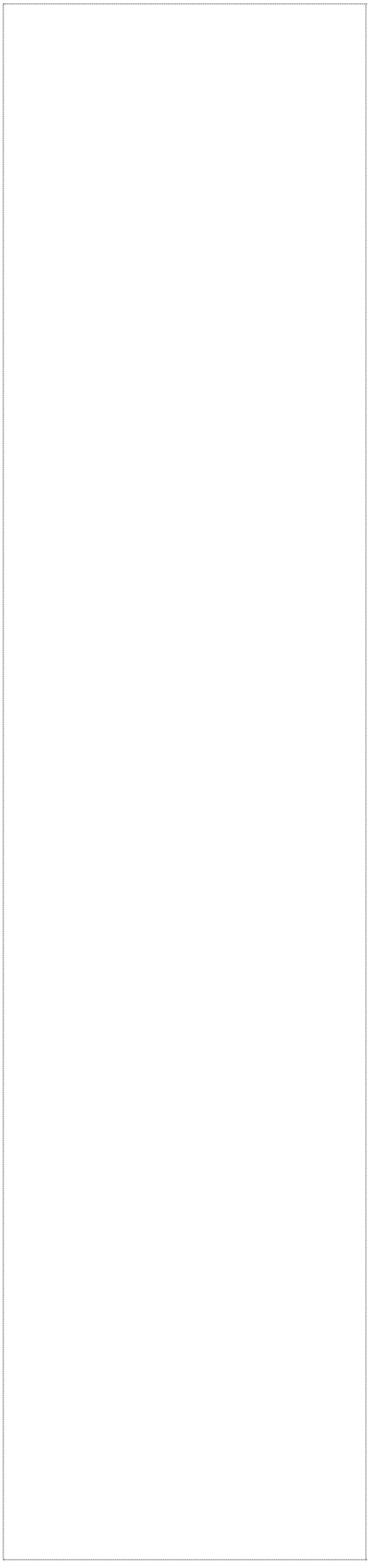
- You cannot mount 16mm film lenses on the WEISSCAM HS-1, because the lens will not light the whole sensor.
- You cannot mount 2/3" lenses, because these will not light the whole sensor

Lightweight Support

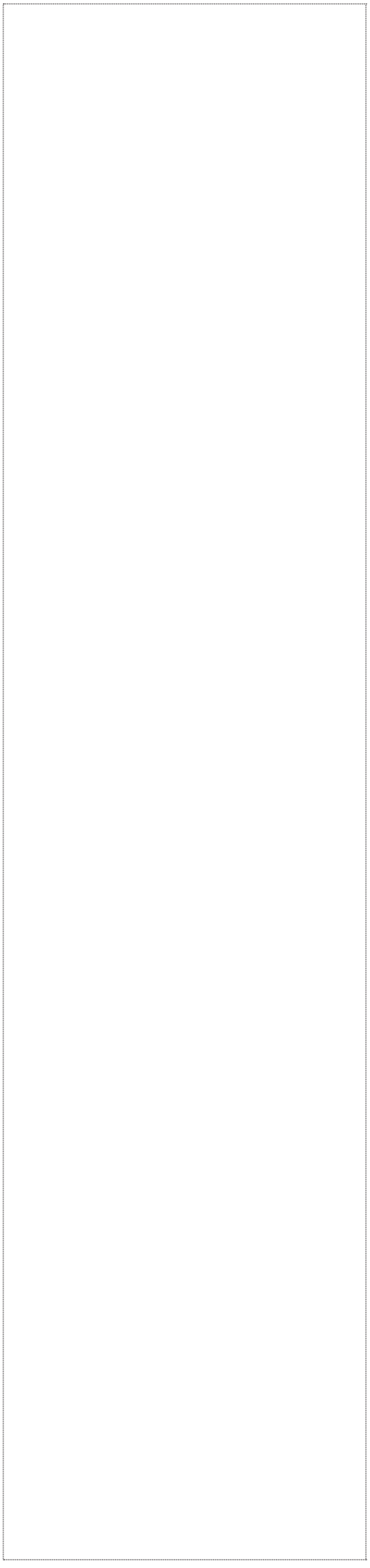
The camera body fits onto the Sony VCT 14 quick release tripod adaptor without additional adapters. But you cannot use the Chrosziel lightweight support with the camera and then put it onto the Sony VCT 14 plate. For 15mm rods, you have to use the Arri lightweight support LWS-3 or LWS-4. The camera body is equipped with the appropriate accessory shoe.

Bridge Plate

The adapter plate for 35mm bridge plates is part of the Weisscam HS-1 delivery content. You can screw it onto the camera bottom. With the adapter plate, you are able to work with standard 35mm bridge plates (i.e. Arri BP-5 used for ARRI 535 camera) and 19mm rods, matte boxes and additional accessories.



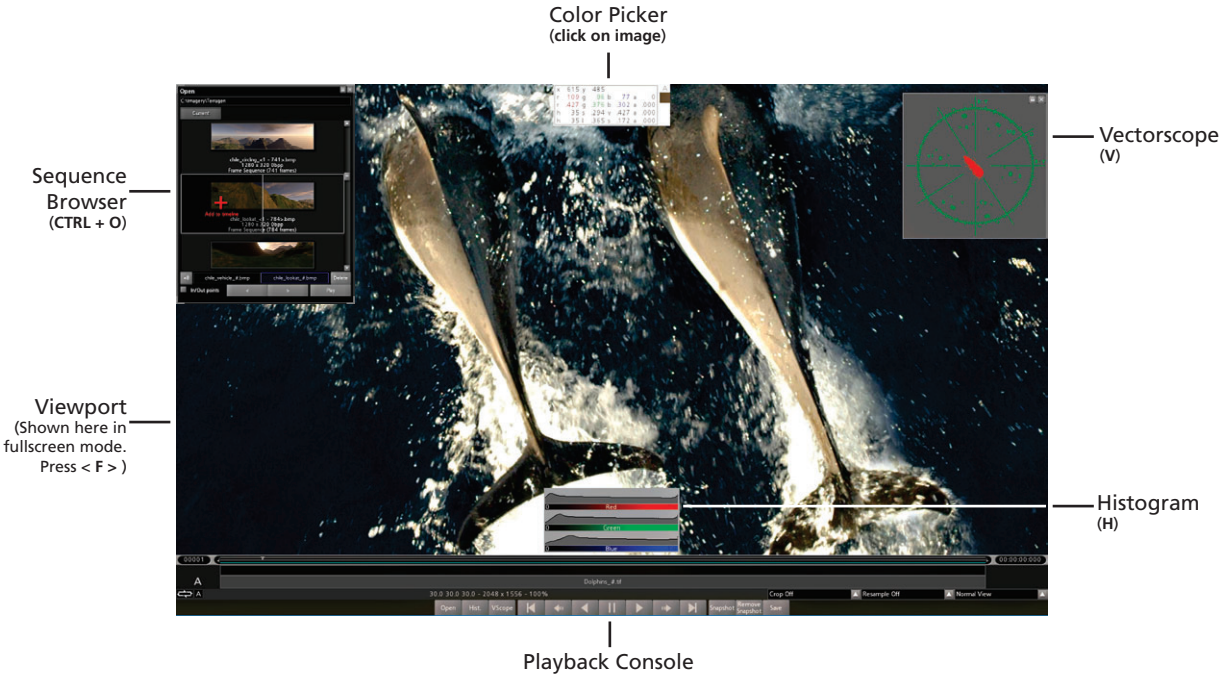
FAQ



ADDITIONAL INFORMATION

FRAMECYCLER Hot Key Overview

Provided by Iridas



Playback Controls

<Space>	Start / Stop playback
<SHIFT> <Space>	Reverse playback
<CTRL> <Space>	Stop playback
<.><CursorDown>	Play forward
<,><CursorUp>	Play reverse
I or <HOME>	Goto In Point
O or <END>	Goto Out Point
<SHIFT> I	Set In Point
<SHIFT> O	Set Out Point

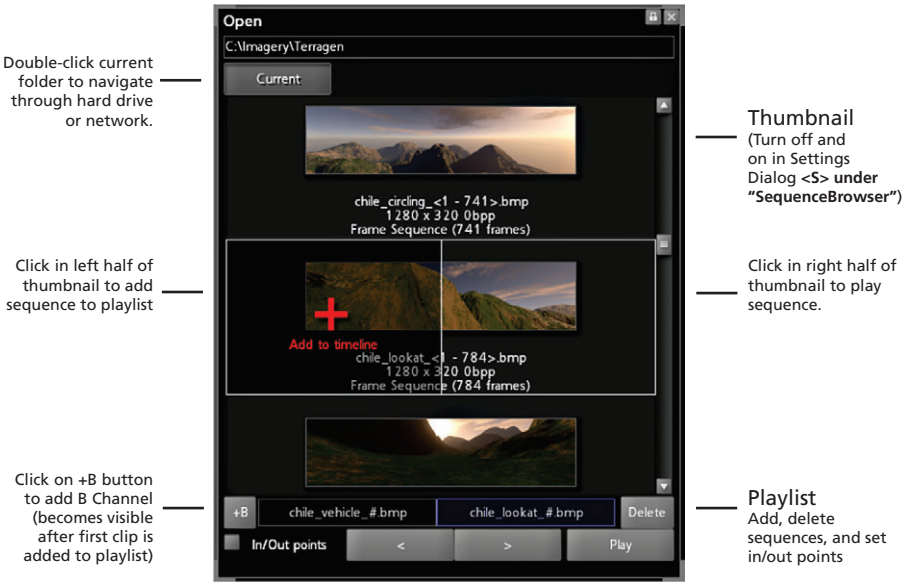
Playback Controls

<ALT> I	Set In/Out Points to cache area
F5 or U	Reload changed frames
<SHIFT> F5 or<SHIFT> U	Unload frames outside in/out area
<SHIFT><CTRL> F5 or<SHIFT><CTRL> U	Unload all frames
<CursorLeft>	Single Step Left
<CursorRight>	Single Step Right
<F6>	Cycle playback mode - loop, single run, ping pong
<Numpad />	Reduce playback speed by half
<Numpad *>	Speed up playback to double current speed
<PgUp>	Speed up playback by 1fps
<PgDn>	Slow down playback by 1fps
<ALT><S>	Toggle shuttle mode for scrubbing

Mouse Actions

Left Mouse Button Drag	Over the viewport: Show color sampler cursor Over the time line: Set playback position
Right Mouse Button Drag	Over the viewport: Scrub Over the position bar: Move in/out area
Center Mouse Button Drag	Pan
<CTRL> Mouse Movement	Drag A/B channel divider if in split screen mode
ScrollWheel	Scrub
<SHIFT> ScrollWheel	Increase/Decrease Playback Speed
<CTRL> ScrollWheel	Increases or decreases size of viewport.

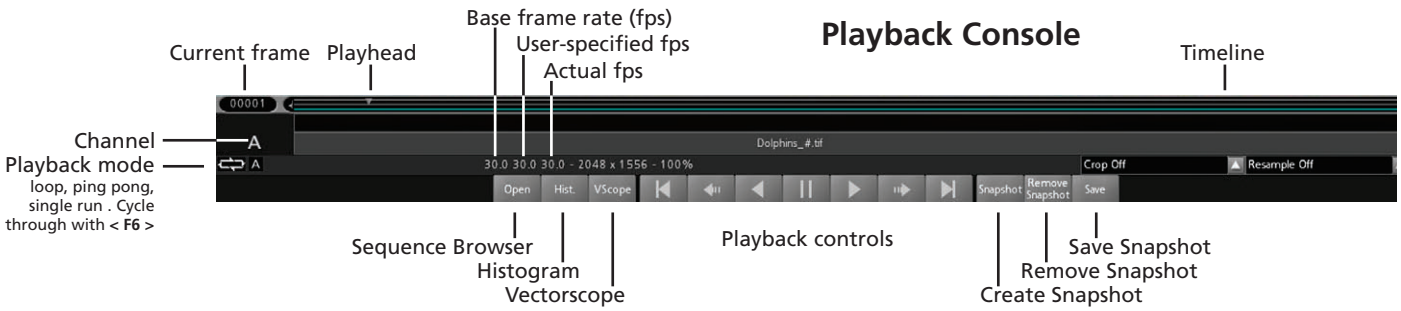
Sequence Browser

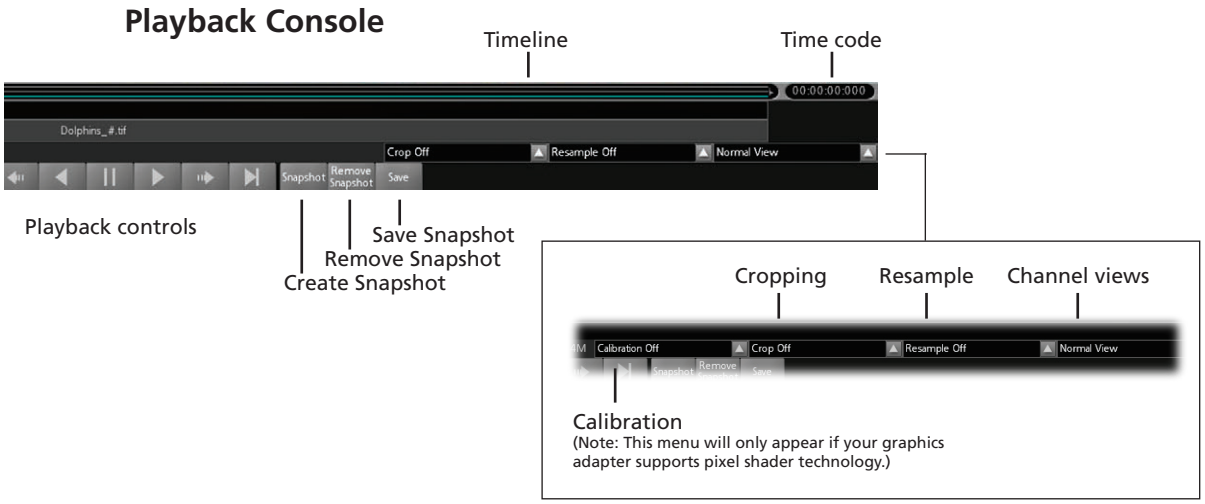


Manipulating Sequences

<F9>	Cycle A/B modes - side by side, one channel only, split screen
<F10>	Toggle vertical or horizontal orientation
<F11>	Flip channels
<Numpad Plus>	Zoom in
<Numpad Minus>	Zoom Out
<CTRL> Home	Zoom To Fit
<SHIFT><CTRL> Home	Zoom To 100%
<SHIFT><Cursor>	Pan
<SHIFT><Home>	Pan to 0/0
M	Mirror horizontally
<SHIFT> M	Mirror vertically
<CTRL> M	Enable automirror (sequence will be flipped horizontally whenever out point is reached)
<CTRL> F4	Close Sequence

Playback Console





Analysis Tools

<SCROLL LOCK>	Lock user interface
<CTRL> O	Toggle Sequence Browser
Mouse click	Click and hold anywhere on image to bring up the Color Picker. Drag cursor to compare neighboring pixels.
Z	Toggle Interactive Zoom Window (SHIFT + mouse movement resizes window)
H	Toggle Histogram display
V	Toggle Vectorscope display
W	Toggle waveform display (when sound is on)
<SHIFT> W	Toggle RAW file loading settings dialog
<CTRL> S	Save IRCP file (preliminary)
S	Activate Settings Dialog
<SHIFT> <CONTROL> <ALT> S	Toggle statistics dialog

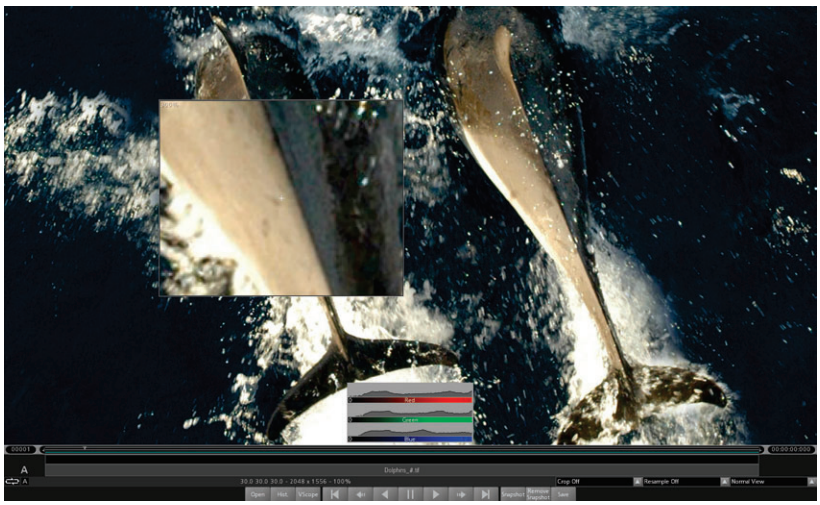
Bookmarks

<F2><CTRL><CursorRight>	Next bookmark
<SHIFT><F2><CTRL><CursorLeft>	Previous bookmark
<CTRL><F2>	Toggle bookmark
<CTRL><CursorUp>	Set bookmark
<CTRL><CursorDown>	Reset bookmark
<ALT><F2>	Set bookmarks to playlist clips
<ALT><CursorLeft>	Set in/out area to next bookmark
<ALT><CursorRight>	Set in/out area to previous bookmark
<ALT><0..9>	Set in/out area to bookmark 1..9
<CTRL><0..9>	Move to bookmark 1..9

Channels / Gamma

R, G, B, A	Red, Green, Blue, Alpha Channel
<SHIFT> R, G, B	Hide Red, Green, Blue
L	Toggle HLS L channel
<SHIFT> A	Enable quick mask alpha channel view (alpha channel is superimposed in red over the image).
<CTRL> A	Enable quick mask alpha channel view with inverted alpha channel
C	Toggle Gamma/Gain/Offset window

Interactive Zoom Tool



Toggle Interactive Zoom Window on/off by pressing **< Z >**. **< SHIFT + drag >** to resize.
< CNTRL + scroll > to adjust magnification. <SHIFT + Z > locks the window in place.

TECHNICAL INFORMATION

Camera

Resolution	1280 x 1024 pixel
Frame Rates	Up to 1.150 fps 720 x 576 pixel SD PAL (4:3)
Frame Rates	Up to 950 fps 1280 x 720 pixel HD 720p (16:9)
Frame Rates	Up to 650 fps 1280 x 1024 pixel with maximum resolution
Sensitivity	160 ASA
Dynamic Range	8 bit color depth, 10 bit DPX*, 10 bit monochrome
CMOS Imager	15 x 12 mm (0.591 x 0.472 inch), progressive scan
Internal Memory	4 GB RAM
Lens Mount	Interchangeable: Arri PL, Panavision, Nikon, Canon EF and BNC-R
Viewfinder	PAL or NTSC (not switchable)
Hand Unit	Control START / STOP of camera, smooth live ramping and jump ramps
DC Out	12 V DC out, Hirose 4 pol
DC In	12 V DC in, XLR 4 pol
Video Out	Composite for external monitors
Data Transfer	Firewire or Fibre glass (FOL)
Power Consumption	12 V
Dimensions	381 x 237 x 162 mm / 15 x 9,3 x 6,4 inch
Weight	6 kg / 13.2 lb.

Control Unit

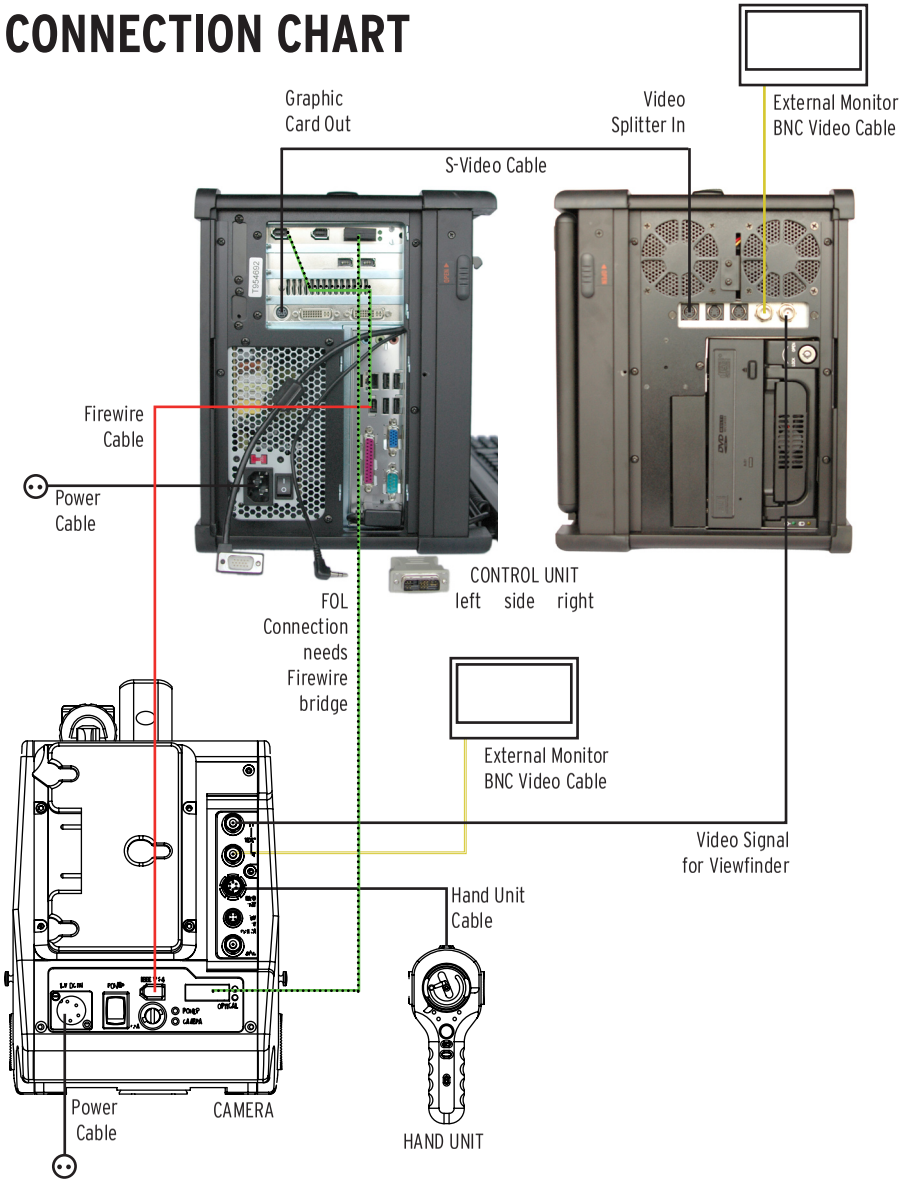
Operating System	Windows XP Professional
Processor	Intel Dual Core 3,0 GHz
RAM	2 GB
Disc Space	Ex works 2 x 250 GB S-ATA HDDs
Removable Hard Drive	250 GB S-ATA HDD
Display	1024 x 768 pixel, 38 cm / 15 inch diagonal, contrast ratio 400 : 1
Monitor Connectors	2 x Composite, 2 x Component
Power Consumption	90 - 230 V
Dimensions	420 x 280 x 230 mm / 16,5 x 11 x 9,1 inch
Weight	16,5 kg / 36.4 lb.

Software

Output Formats	8 bit tiff uncompressed, avi, 10 bit DPX*, create MPEG files for proxys**
Image Format	Any image format from 10 x 1 pixel to 1280 x 1024
Color algorithm	Different algorithms available, smooth and crisp image rendering
Shutter	From 1/ fps to 1/100.000 fps, independent from frame rate
Image Control	Separate control of gamma and RGB curves
Live Picture	Control framing during recording on all connected monitors
Instant Playback	View your shot in realtime right after downloading from camera

* after software update

CONNECTION CHART



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weisscam
HS-1

QUICK REFERENCE GUIDE

- Choose your ***resolution*** and press accept
- Choose your ***pixelclock*** (67 or 86) and press accept
- Choose your ***frame rate*** by setting the exposure time and accept
- Check your ***CamRam*** (one or more segments) and press accept
- Set your ***Recorder Mode*** (Sequence or Ring Buffer) and accept
- Check your ***Trigger Mode*** (Auto Sequence or External Exp. Start) and accept
- ***Check*** your image (Focus, T-Stop, White Balance and Gamma)
- **Control** your RGB values with the mouse cursor
- ***Record*** your sequence (Software Triggering or Hand Unit Triggering)
- ***Preview*** your recorded sequence and note Cut In and Cut Out points
- Download your sequence from Camera (***Export Recorder***) (Check algorithm settings)
- Double Check footage with ***FrameCycler***
- Make a ***Safety Copy*** onto a second hard drive

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HS-1

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