

# **SI-2K Digital Cinema Camera**

- → 2K DCI-compliant CMOS sensor
- → More than 10 F-stops of dynamic range
- > Removable, remote-controllable camera head
- → P+S Technik Interchangeable Mount System
- > P+S Technik ultra-tough aluminum alloy chassis and accessories
- → Direct-to-disk CineForm RAW<sup>™</sup> portable recording solution
- → Embedded IRIDAS SpeedGrade<sup>™</sup>
- Embedded SiliconDVR software

### Modular Digital Cinema Camera System with Touchscreen Interface

#### **Sensor & Sensibility**

The all-in-one portable design of the Silicon Imaging SI-2K combines a digital cinema class 2048 x 1152 resolution camera head with unprecedented image quality and shooting flexibility. It's low-noise, high-dynamic range images, with over 10 f-stops of dynamic range via an on-chip 12-bit A/D converter, are freely manipulatable with user-generated Iridas .look files, creating a "blank slate" for the cinematographer to freely express his or her vision.



#### **Lenses & Mounts**

The SI-2K Mini uses a 16:9 format 2/3" CMOS sensor, and its single large image design enables the use of cost-effective 16 mm film-style lenses, eliminating the optical aberrations caused by a 3-chip prism assembly. Shooting flexibility is enhanced with the P+S Technik Interchangeable Mount System: an intermediate positive lock mount allows the exchange between different lens mounting rings within seconds. More than 10 different mounts are available to support the use of B4 2/3" video lenses, high-quality modern cinema PL-mount lenses as well as affordable F-mount and compact C-mount lenses and more.



#### **Support Accessories & Power Supply**

The integral support for 15 mm lightweight rods and direct attachment of 19 mm Arri style bridgeplate adapters make the SI-2K an ideal platform for the latest in follow-focus attachments, matte boxes, and other cinema-style gear and accessories. An industry standard, Anton Bauer Gold Mount is used for battery power and portable operation.

#### Remote control for the camera head

For situations too extreme or space limited for the camera operator to maintain direct physical operation, the SI-2K features the ability to remotely tether the camera head via gigabit Ethernet over long distances while maintaining full control of the camera. The separable camera head's built-in power regulator allows battery operation from 5-17 V DC with a miniscule 6 Watt of power consumption. For very long distances, off-the-shelf fiber optic converters can be added to extend distances past the threshold of copperbased gigabit.





#### Data storage & Digital Magazines

Choose from several recording media options for up to four hours recording time for the SI-2K Recording Unit: Digital Standard Magazines (160 GB HDD or 32 GB SSD) and Digital RAID Magazine (320GB HDD). Magazines can be downloaded using a reader or USB 2.0 connection.





# **Viewing-Options**

#### **LCD Touchscreen Monitor**

The LCD touchscreen is the main operating interface of the SI-2K Camera System. Large menu buttons provide extensive software functionality just one fingertip away. Through the integrated active VGA signal the monitor provides the output for a second viewing device such as the electronic viewfinder.



#### **Electronic Viewfinder**

The electronic viewfinder available for the SI-2K Digital Cinema Camera System is based on OLED technology and reproduces a stunning sharp electronic image. The viewfinder is fed with a VGA signal with a resolution of 800 x 600 pixel and shows the complete camera control menu.



#### **Optical Viewfinder**

P+S Technik exploited it's vast knowledge about optical viewfinders and created a solution for the SI-2K Digital Cinema Camera, which includes a 50/50



prism, left eye usability and eyesight adjustment. The unit is compatible with the P+S Technik Interchangeable Mount System and can be added within seconds. It is part of the modular accessory structure for the SI-2K camera to offer a maximum of flexibility. The optical viewfinder is available with a fixed B4 Mount.

#### **Further Accessories**

Useful accessories such as non-heatable and heatable eyepiece cups, viewfinder extension with integrated zoom function or wide angle eyepiece can be used together with the optical viewfinder for the SI-2K.

#### Audio & Timecode intergration

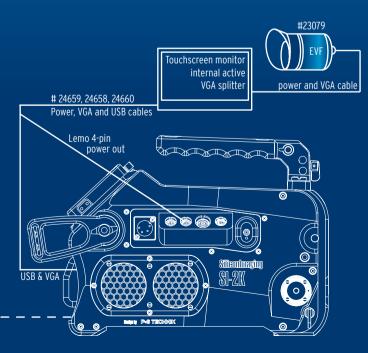
The SI-2K Recording Unit allows internal dual channel audio recording in 48 Hz / 16 bit as well as timecode connectivity using Ambient ALL601 for syncronisation of an external audio recording device.

#### Monitoring setups

The SI-2K Recorder delivers a VGA signal (800x600) and an HDMI signal (1280x720), which can be converted to HD-SDI for monitoring.

HD-SDI signal

> Signal converter HDMI (DVI) > HD-SDI



## **SI-2K Mini Camera Head**

- → 2K Resolution
- → Single CMOS Sensor
- → DCI compliant
- → 10+ F-stops of dynamic range
- → Interchangeable Mount System (IMS)
- → Lightweight
- → Modular Extensibility
- Multi-Camera Head Setups for Stereoscopy and Special Effect Cinematography





### **Technical Specifications**

Lens Mount

Data Transfer

Power Input

Dimensions (SI-2K Mini camera head only)

Weight (SI-2K Mini camera head only)

**Optimal Operating Temperature** 



1) SI-2K Mini camera head cabled to SI-2K Recording Unit



2) SI-2K Mini Camera Head Ethernet wired to a Laptop



3) 3D Rig for stereoscopic recording with two SI-2K camera heads



4) 180° recording setup with four SI-2K camera heads and C-mount lenses subject to technical change without notice

P+S Technik Interchangeable Mount System (IMS)

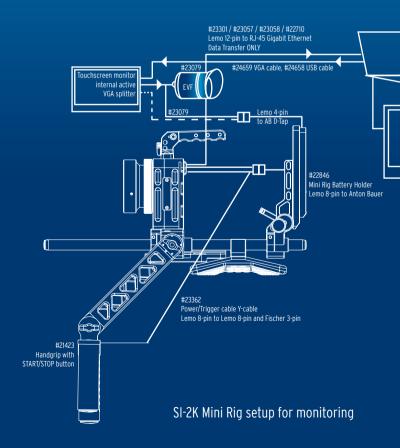
**Gigabit Ethernet** 

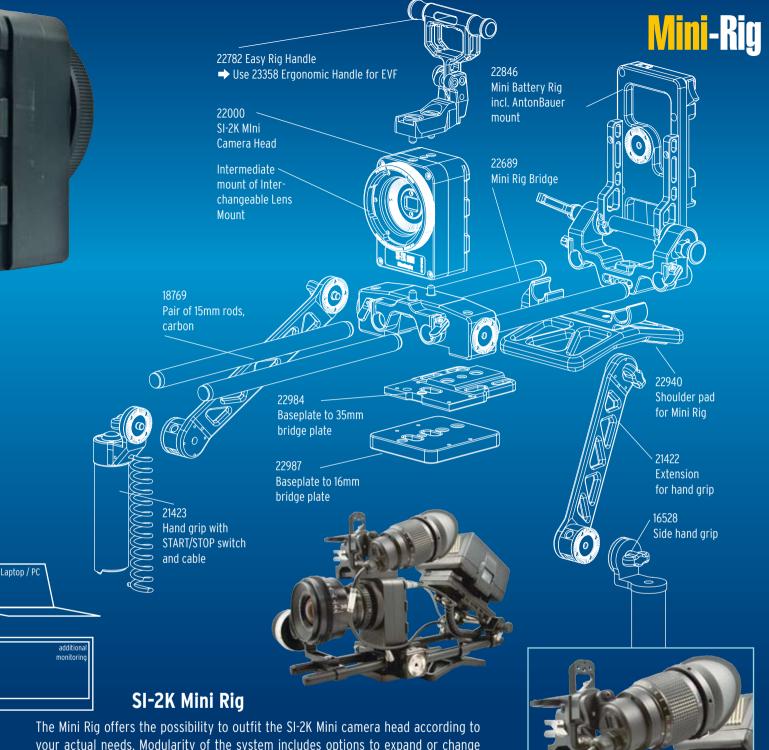
12 V, Lemo 8-pin connector

105 x 70 x 45 mm

600 grams / 1.32 lbs

0 - 50° C





your actual needs. Modularity of the system includes options to expand or change the setup for different projects. The P+S Technik Interchangeable Mount System (IMS) enables the use of hundreds of lenses like e.g. B4 mounted 2/3" video lenses, 16 mm and 35 mm cine PL lenses, 35 mm still photography lenses.

The integrated 15mm support interface follow focus, lens control systems and matte boxes can be attached and operated as shown.

Using the ergonomic handle with the Mini Rig, you can easily attach the electronic OLED viewfinder equipped with the 3-axis adjustable holder.

→ Use the adjustable battery holder to counter-balance the weight of camera head and lens system.





## **SiliconDVR software and Work-Flow**

### SiliconDVR Software

SiliconDVR features a number of innovative features designed with the demands of digital cinema production in-mind. Items such as direct recording to CineForm's visually lossless RAW codec or 12-bit uncompressed, a fully embedded 3D LUT color-management interface powered by Iridas, and seemless IT integration combined to create a best-in-class tool that exceeds the standards of the most demanding productions. Furthermore, the software-extensibility of the SiliconDVR platform ensures an upgrade-path and new feature integration that no other firmware-based camera can compete with.

#### **User Interface Design**

The industry-leading feature-set of SiliconDVR does not stop with just a set of core functionality. Re-thinking the paradigm of GUI design, SiliconDVR's touchscreen-driven interface places the key controls at the fingertips of the camera operator. The GUI has been designed to get what you want fast, and features an extensive array of utilities to analyze the incoming camera RAW data to achieve the best picture quality possible.

#### **Features**

Per-channel histograms, center zoom modes, an exposure-based zone system display, edge-enhanced focus aids, spot meters, separate view LUT's, and an on-screen 4x loupe are among a number of features that the SiliconDVR interface features to put the cinematographer in complete control of their image. Other enhancements such as a full-screen mode, and full-screen dual-monitor support with independent full-resolution real-time displays, provide integration points with standard on-set systems.



#### Direct-to-Disk Recording & Playback

Integrated direct-to-disk recording is an inherent part of SiliconDVR's production workflow advantage, allowing the director and other crew members to see the results of any shot immediately after recording. When combined with a next-generation playback interface composed of an integrated timeline and shot-list review feature-set, SiliconDVR frees the review process from the linear restraints of tape and simple play/pause interfaces found on other camera systems.

#### **Post Production Workflow**

After recording directly to disk, the footage can be accessed by an editing system (NLE). Final Cut and Adobe Premiere are supported. The camera is able to generate .mov or .avi wrapped RAW files. No proxies or transcoding is needed as CineForm plugins allow realtime access of the recorded full resolution image. AJA and Blackmagic support allow HD-SDI playout to tape via the NLE. For professional mastering, the footage can be transferred to the P+S Technik OneBox which is able to conform from EDLs. The OneBox not only comes with a full Color Grading Tool Set, it also offers solutions for backup, batch transcoding and quality control.

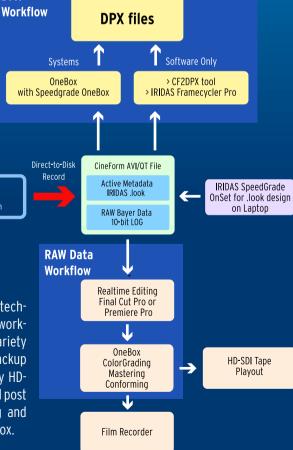
#### **DPX Workflow Solutions**

The SI-2K is supported by a variety of tools. CineForm's CF2DPX conversion tool allows efficient command line processing of RAW files into DPX sequences. Iridas' Framecycler and Metarender products provide batch conversion of clips to a wide number of file formats, as well as trimming, window-burn overlays, and basic one-light correction.

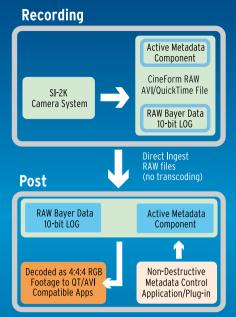


#### P+S Technik OneBox

The OneBox offers state-of-the-art technology to implement an efficient workflow for digital RAW cameras. The variety of applications reach from data backup and archiving as well as full quality HD-SDI playout for dailies or tape-based post production to even full mastering and colour grading, all bundled in OneBox.







#### Metadata

At any time during the workflow process, metadata contained inside the RAW files, such as the white-balance, gamma, .look 3D LUT's, and other active metadata (e.g. the demosaic settings) can be changed on the fly through global metadata management tools and host application plug-ins from CineForm. Alternatively, Iridas's SpeedGrade OnSet can natively import CineForm RAW AVI and Quicktime files and allow the user to generate new .look files which can then be non-destructively reapplied to groups of clips in order to generate new or refined versions of the director's vision.

#### CineForm RAW Codec

SiliconDVR records directly to CineForm RAW<sup>TM</sup> digital intermediate, a powerful, 10-bit visually lossless codec that preserves the RAW bayer data in industry-standard QuickTime and AVI file wrappers. Applications such as non-linear editing systems can seamlessly ingest these QuickTime and AVI files, providing users the same common workflows used with normal RGB or YUV-based camera codecs. Providing full-raster 4:4:4 RGB decodes from the RAW bayer data in pristine quality is only the first part of the equation though. A 32-bit floating point metadata color-management system allows the complete tonal range of the captured image to be preserved through multiple passes. Finally, the high-quality 3.5:1 wavelet-based compression maintains a visually lossless pristine image throughout the production pipeline.

#### **Iridas Color Management**

At the core of SiliconDVR is a powerful suite of color-correction tools and visualization features powered by Iridas .look XML format. Whether created in the SpeedGrade family of software tools, or created internally in SiliconDVR's color-correction mode, .look compatibility allows for an open exchange of an unlimited number of "look" possibilities between the camera and standard post-production tools. Additionally, .look files can be previewed and applied to footage in-context of the SI-2K camera system itself, giving the director of photography the tools to communicate his or her artistic intent for the scene directly on-set.

#### .look Design

Colorizing and designing the "look" of a shot or setting the stylistic tone for a movie is no longer subject to a dizzying array of confusing submenus and non-intuitive control panels. Instead, SiliconDVR's color management features provide direct in-context color-correction of images from the SI-2K, enabling what-you-see-is-what-you-get interactivity for complete accuracy and confidence in sculpting the look of your project.

#### Iridas .look XML format

The Iridas .look XML format provides a straight-forward platform for communicating color information such as gain, saturation, gamma, temperature, and contrast adjustments on both a global scale, and on a localized sclae for just the highlights, mid-tones, and shadows of an image. Additionally, 3x3 calibration matrices and film calibration 3D LUT's can be incorporated into each .look file, creating an unprecedented ability for the manipulation of colorspace, or allowing the cinematographer to adjust colors in context of the final film print or digital projection colorspace.

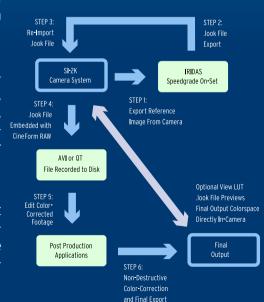
#### Consistent through complete workflow

Tight integration between Iridas and CineForm at the codec level means the era of "looks" being lost in the transition from the set to the edit bay is over. All files recorded with SiliconDVR are color managed at the codec level, maintaining the look and vision of the DP from the set through the entire post-production chain. By incorporating a comprehensive display and codec-based color management toolset through support from CineForm and Iridas, if you can imagine it, you can capture it.



Embedded SpeedGrade OnSet module in SiliconDVR for powerful in-context color correction

#### Iridas Color Integration in SiliconDVR



## **Order Information**

# **Order-Info**

UI-UG	i miorination		
Art.No.	Description	Art.No.	Description
22000 incl.  (Additional 19000 incl.	SI-2K Mini Camera Head  - P+S Technik IMS camera mount  - License for CineformRAW™ Encoder, Iridas Speedgrade Embedded License, Silicon DVR Software  - 10 m GigaBit Ethernet Cable (Lemo 12-pin to RJ45) (#22710)  - 2 m power cable (Lemo 8-pin to XLR 4-pin) (#22711)  silly needed: one IMS lens mount, recording PC & power supply)  SI-2K Recording Unit  - Video & audio I/O interface  - Top handle  - Cable clamp	22689 22987 22984 22846 23358 22782	Package Mini Rig Support Bridge incl. pair of 15mm rods (ONLY with one baseplate interface #22987 or #22984) Baseplate to 16 mm cine bridge plate Baseplate to 35 mm cine bridge plate Mini Rig Battery holder incl. Anton Bauer battery mount, power cable Lemo 8-pin Ergonomic Handle for SI-2K Mini incl. interface for EVF Easy Rig Handle for SI-2K Mini camera head
(Additiona power sup 22736 incl.	- Sub-D Audio to XLR adapter (#23405) - SATA hard disk carrier with 160 GB hard disk - Interface for 15 mm rods and quicklock plate flly needed: Art.No. #22000, one IMS lens mount, rods, viewing option, flly)  SI-2K Digital Cinema Camera and Recording System, - SI-2K Mini Camera Head, incl. as in #22000 - SI-2K Recording Unit, incl. as in #19000	Cables f 23301 23057 22710 23058 22711 23362 23296	or SI-2K Mini SI-2K Mini Gigabit Ethernet cable, 2 m SI-2K Mini Gigabit Ethernet cable, 5 m SI-2K Mini Gigabit Ethernet cable, 10 m SI-2K Mini Gigabit Ethernet cable, 25 m Power cable SI-2K Mini, Lemo 8-pin to XLR 4-pin, 2 m Power/Trigger cable, to battery holder & Fischer 3-pin Power/Trigger cable, to XLR 4-pin & Fischer 3-pin
- Connection cable #23059 (Additionally needed: one IMS lens mount, rods, viewing option, power supply)  Software For details on software, please contact us by email at SI-2K@pstechnik.de			Adapter plate to 35 mm cine bridge plate  Adapter plate to 35 mm cine bridge plate
	PL Mount, Interchangeable Mount System B4 Mount, Interchangeable Mount System C Mount, Interchangeable Mount System Professional F Mount, Interchangeable Mount System Nikon F Mount, Interchangeable Mount System Canon EF Mount, Interchangeable Mount System Canon FD Mount, Interchangeable Mount System Contax Mount, Interchangeable Mount System Leica R Mount, Interchangeable Mount System Leica M Mount, Interchangeable Mount System Panavision Mount, Interchangeable Mount System	23158 23158 23945 23948 25859 23946 23059 23060 23136 23950 23951 23405	Digital Standard Magazine for 2.5" SATA HDD (no HDD) Digital RAID Magazine for 2x 2.5" SATA HDD (no HDD) Digital Standard Magazine 160 GB HDD (incl. HDD) Digital Standard Magazine 32 GB SSD Extreme (incl. SSD) Digital RAID Magazine 320 GB HDD (incl. 2x 160 GB HDD) Digital Magazine Reader for PC fits 2,5" or 3,5" slots SI-2K to SI-2K Mini Connection cable, 5 m SI-2K to SI-2K Mini Connection cable, 10 m SI-2K to SI-2K Mini Connection cable, 25 m SI-2K Accessory power cable, 5 V, open end SI-2K Accessory power cable, 12 V, open end Sub-D Audio to XLR 3-pin Adapter, stereo I/0
20506 Viewing 23321 23079 23520 24641 24733	Options Optical Viewfinder with B4 Lens Mount for 2/3"IMS cam. SI-2K Electronic Viewfinder, incl. adjustable holder, cable Power adapter cable for use of EVF with Mini Rig 8.4" LCD Touchscreen Monitor for SI-2K, incl. cables Power adapter cable touchscreen, Lemo 4p to D-Tap, 1 m		Accessories Shoulder Pad for Mini Rig Shoulder Pad for SI-2K Recording Unit Extension for hand grip (one piece, two necessary) Side hand grip Hand grip with START/STOP switch and cable
24734 23063 24058	Sun Shade for SI-2K Touchscreen Monitor Flex arm, 1/4" to 1/4" screw Flex arm, 1/4" screw to rosette	21255 18769 16243 16251	Pair of rods for light weight support, 15 mm, L=150 mm Pair of rods for light weight support, 15 mm, L=240 mm Bridge plate, S/N35, incl. pair of 19 mm rods, L=440 mm Pair of rods for bridge plate, 19 mm, 440 mm
Power Supply Accessories For information on power supply and battery options that we offer, please contact us by email.		<b>Cases</b> 23972	Small soft bag for SI-2K Camera (Kata), hand luggage
Lenses by P+S Technik For information on the 16Digital lens set which we offer for the SI-2K, please		24458 23973	Large soft bag and trolley for SI-2K Camera (Kata)  Large case for SI-2K Camera System and Accessories  Case for SI-2K Mini camera head Mini Dig and Lanton

23974

Case for SI-2K Mini camera head, Mini Rig and Laptop

contact us by email at 16digital@pstechnik.de

# **Additional-Information**

## **Credits**

Title		Production / Director	Photography by
Slumdog Millionaire	Feature	Danny Boyle	Anthony Dod Mantle
Sherlock Holmes	Feature	Guy Ritchie	Alan Stewart (2nd unit)
The Eagle Hunters Son	Feature	Stromberg Productions	Dixie Schmidle (bvk)
La Leyenda I	Feature	Sebstián Pivotto	Hector Morini
Caño Dorado	Feature	Eduardo Pinto	Daniel Ortega
Two Flags	Feature	Lior Molcho	Danit Sigler
Dark Country 3D	3D Feature	Thomas Jane	Geoff Boyle



Wanderlust / Biörk 3D Music Video Encyclopedia Pictura (Isaiah Saxon / Sean Hellfritsch) **Coatwolf Productions OK Stranger** Music Video Evan Glodell **Dresden Dolls** Music Video Highway 101/Andrew Bennett Andy Strahorn







#### Ari Presler, CEO Silicon Imaging

"Our idea behind the SI-2K was to create a flexible, easy to use camera without compromising quality. By capitalizing on the skills of our partners, we were able to bring a camera to market that addresses the full spectrum of content creation-Shoot.Edit.Deliver."

#### Alfred Piffl. CEO P+S Technik

"We were convinced by the impressive image quality which Silicon Imaging generated from the 2K CMOS sensor. The RAW data workflow is straight forward as well, because this process distinguishes the digital negative from video images."

#### Hannes Stromberg, Director / Producer

**David Higgs** 

"One of the main advantages against other digital cameras, is the possibility to detach the camera head from the recording unit. We took great advantage of the small unit when recording in restricted spaces like cars or lorries and were gaining focal length at the same time."

#### Anthony Dod Mantle, Director of Cinematographer

received the Oscar Academy Award for Best Cinematography 2009 for Slumdog Millionaire which was shot on SI-2K in most parts.

## **Further Accessories**



### 35 Digital Lens Set

The Nikon F mounted lens set consists of a 18 mm/T3.5, 25 mm/T2.8, 35 mm/T2.0, 50 mm and an 85 mm lens, both T1.4.

P+S Technik re-housed the Zeiss lenses to fit them into the existing world of film and video accessories like follow focus', lens controls and matte boxes. Each lens is equipped with a standard 0.8 gear ring and has a front lens diameter of 85 mm, except the 18 mm has 95 mm.



#### 16 Digital Lens Set

P+S Technik offers a new set of high quality 16 mm format lenses especially designed for digital cameras with a 16mm size sensor. The small and lightweight lenses fit directly into the IMS camera mount of the SI-2K. The set includes an 8mm / T1.9, 12mm / T1.9, 16mm / T1.7, 25mm / T1.7, 35mm / T1.7 and 50mm / T1.9 lens. Each lens is equipped with standard 0.8 gear rings and has a front lens diameter of 60 mm.

### **Specifications**

#### DCI-Compliant 2K Sensor

- 2/3" 16:9 high-dynamic range CMOS sensor
- 12-bit A/D conversion and 48-bit digital signal processing
- 10+ F-stops of dynamic range
- 180° film shutter equivalent with variable speed control
- Sensitivity at 0 db: 250 ASA at 3200 K and 160 ASA for 5600 K

#### **Multi-Format Capabilities**

- Embedded SiliconDVR software interface with industry-leading
- feature-set, ease-of-use, and future upgradeable
- 2K Formats: 2K/23.976p, 2K/24p 2K/25p
- HD Formats: 1080/23.976p, 1080/24p, 1080/25p, 1080/29.97p, 1080/30p, 720p (variable)
- 720p / 85fps and 540p / 150fps for slow-motion special effects
- Overcranking and undercranking for special effects (12 ~ 72 fps)
- Time-lapse recording with programmable images per minute

#### Silicon DVR Software

- · Frame-store for image recall from image buffer or disk
- Per-channel live histogram display
- Edge-detection focus-aid mode
- · Exposure meter with 6-level false-color zebra
- 2-4x Digital Zoom for fine focus adjustment
- 4x Loupe and integrated spot meter
- Safe-zone Markers for 16:9 / 4:3 / 1.85:1 / 2.35:1
- Instant playback and review via built-in virtual VTR interface
- · Comprehensive file management and metadata capabilities

#### P+S Technik® Ergonomic Design

- Ultra-tough aluminum alloy chassis designed by P+S Technik<sup>®</sup>
- Interchangeable mount system with PL-, B4-, C-mount and more options
- · Removable camera head with ethernet tether
- Fully compatible with Anton Bauer Gold-Mount battery system (14.4 V nominal)
- · Compatible with industry standard Arri or Chrosziel guick-lock base plate systems
- DC power regulation 11.5 ~ 19 V

#### CineForm RAW™ Direct-To-Disk

- Visually lossless CineForm RAW™ wavelet-based codec using SiliconDVR recording software
- · Direct-to-Edit AVI and Quicktime files compatible with CineForm Prospect 4K™
- Variable bit-rate quality encoding CineForm RAW™ settings
- Auto-file naming and project management with metadata
- Up to 4 hours of recording on 160 GB HDD in highest quality mode (CineformRAW compression)
- Alternative: Recording of 12-bit uncommessed on Digital RAID Magazine

#### **Integrated Iridas Color Pipeline**

- Industry's first complete color-managed pipeline from acquisition to post
- Integrated Iridas SpeedGrade controls for unlimited colorization possibilities in-camera
- · Iridas looks are completely non-destructive and are fully integrated into CineForm RAW™ color pipeline
- Non-destructive user-selectable white balance modes: 3200K, 5600K, User and none
- Integrated keyer for green-screen special-effects
- Proprietary adaptive bayer processing for ultra-high quality output in Prospect 4K™
- 32-bit floating point rendering pipeline with support for super white and black points
- · Non-destructive metadata adjustments and post-processing using Prospect 2K™ and Iridas toolset

#### **Audio & SMPTE Timecode Support**

- Balanced Line Level I/O with 16-bit / 48 KHz sampling
- · Audio Recording multiplexed into the video file
- Speaker/Headphone output
- · SMPTE timecode embedded into the video file
- SMPTE timecode syncing to Ambient ALL601 module
- · On-screen Audio Level Left/Right indicators with overload warning

#### **Revolutionary User Interface Design**

- LCD touchscreen with advanced image-scaling technology
- 5-wire resistive interface with integrated USB controller
- Full resolution 2K and HD viewing output
- Dual independent video output with HD-SDI compatibility through DVI-to-HD-SDI converters

Power Consumption (SI-2K Camera Recorder incl. SI-2K Mini camera head)	5 A / 12 V
Dimensions (SI-2K Camera Recorder incl. SI-2K Mini camera head)	290 x 210 x 160 mm
Weight (SI-2K Camera Recorder incl. SI-2K Mini camera head)	7.250 grams / 15.98 lbs
Optimal Operating Temperature (environmental)	0° - 40 °C

Subject to technical change without notice.

SALES NORTH & SOUTH AMERICA, AUSTRALIA & NEW ZEALAND

Silicon Imaging, Inc.

HD@siliconimaging.com

www.siliconimaging.com

**Email** 

Web

25 Covington Court Niskayuna, NY 12309

Tel +1-518-279-9098 Fax +1-518-374-3232

INTERNATIONAL SALES

Web

P+S Technik GmbH

Siemensstrasse 12 85521 Ottobrunn / Munich Germany

Tel +49-89-45 09 82 30 SI-2K@pstechnik.de Email www.pstechnik.de Fax +49-89-45 09 82 40

