SONY
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F65
Digital Motion Picture Camera

CineAlta

Elevating Digital Imaging to the Next Level

In 1999, Sony released the first 24p digital motion picture production system. Over the years, we have refined the technology based on precious inputs from producers, cinematographers, colorists, and engineers. Just to name a few, full RGB imaging, S-Log, Super 35 mm imager, variable frame rate, 3D, and 60p. All these creative features that are commonplace today were pioneered by Sony CineAlta™ products.

As we enter a new paradigm in digital imaging technology, we have decided to give a new look to the prestigious CineAlta logo. Deployment of 4K digital cinema projection systems around the globe has increased the demand for high quality digital content that retains beyond-HDTV resolution. The ever accelerating speed and capacity of IT technology has facilitated people to manipulate high-resolution image files at an unprecedented scale of economy.

Regardless of any changes in technology or economy, our mission is to satisfy the ever escalating demands from the creative minds. Sony is committed to further elevate the image quality and improve the visual experience. The new CineAlta logo symbolizes "infinity", which can be translated into "unlimited creative possibility", or "endless pursuit in perfecting technology".

F65 – True 4K and Beyond

Its debut has been long-awaited, and now Sony proudly introduces a state-of-the-art digital motion picture camera, the F65 – the next-generation CineAlta camera for digital motion picture production.

Equipped with Sony's newly developed 8K CMOS sensor, the F65 offers higher resolution, increased exposure latitude, and a wider color gamut than any previous digital motion picture camera, delivering brilliant HD, 2K, and true 4K images today. And it is ready to go far beyond 4K in the future as the industry evolves.

Unparalleled Image Quality

The unique characteristics of the newly developed CMOS sensor will achieve greater scene reality than ever before.
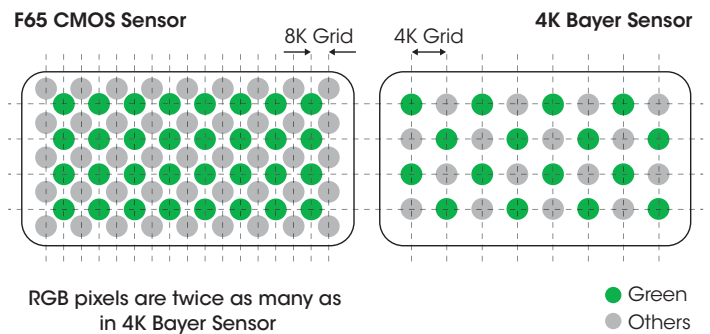
State-of-the-art 20 Megapixel Super 35 mm-sized CMOS Sensor

The F65 camera is equipped with a newly developed Super 35 mm-sized CMOS sensor to yield a total of 20 megapixels*. While a typical 4K sensor has half as many green pixels as there are pixels in 4K output, the F65 sensor has one green pixel for each 4K (4096 x 2160) output pixel. This unique sensor structure delivers unparalleled resolution for 4K digital cinema content production.

* Effective 19 megapixel count.

## Wide Exposure Latitude, High Sensitivity and Low Noise

Due to this new imager and 16-bit in-camera digital signal processing, the F65 camera delivers exquisite images with increased exposure latitude of up to 14 stops. Camera base sensitivity is rated at 800 EI, although the extremely quiet noise floor allows the F65 to push sensitivity above ISO3200 depending on the creative intent.

F65 CMOS Sensor   8K Grid   4K Grid   **4K Bayer Sensor**

RGB pixels are twice as many as
in 4K Bayer Sensor

● Green
● Others

Extended Color Gamut

Thanks to the unique characteristics of the color filter array on the sensor, the F65 camera captures a much wider color space than Sony's previous F35 camera. Supporting AMPAS IIF-ACES*, the F65 camera expands the creative potentials of contrast and color reproduction for filmmakers.

* Image Interchange Framework, Academy Color Encoding Specification: the master format for next-generation cinema production by AMPAS (Academy of Motion Picture Arts and Sciences).
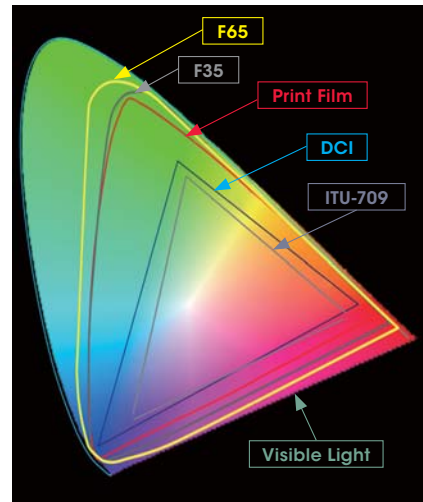
All images captured with **F65**

Enhanced Flexibility

The F65 camera will provide many options to satisfy various creators' demands.

Up to 120 fps High-speed Recording*

The F65 camera, docked with the SR-R4 on-board SRMASTER™ recorder, offers high-speed recording of up to 120 frames per second (fps). That is especially useful for creating slow motion effects. The recording frame rate can be adjusted from 1 fps to 120 fps in one-frame increments and can be changed even while recording.

* 61 fps to 120 fps and variable frame rate recording will be supported by a software upgrade.

Rotary Shutter and Built-in ND Filter (F65RS only)

Typical CMOS sensors suffer from the so-called jello effect (rolling shutter artifact), in which moving objects are deformed or vertical objects are distorted during fast camera pans. Consisting of two blades, a newly developed mechanical rotary shutter for the F65 camera effectively shields the sensor from incoming light and reduces rolling shutter artifacts. The shutter angle ranges from 11.2 to 180 degrees and can be changed continuously. That allows users to achieve the desired amount of motion blur. Along with this mechanical rotary shutter, four ND filters (0.9, 1.2, 1.5, and 1.8) are located within the camera for easy exposure control without exchanging lens-front optical filters.

Rotary Shutter OFF
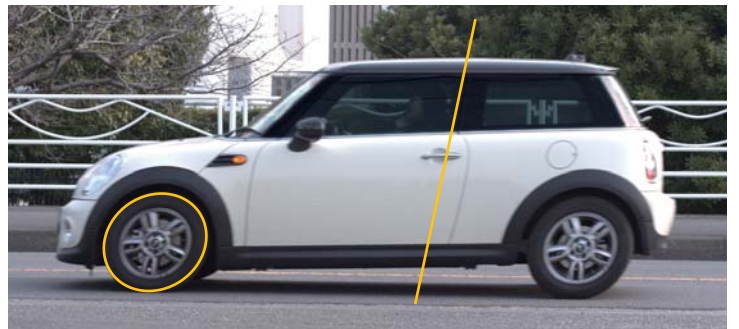
Rotary Shutter ON
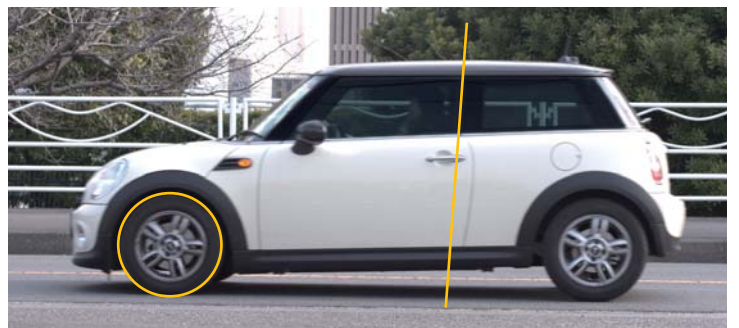
F65 for 4K, 2K, and HD Production

F65RAW Mode

F65RAW mode allows maximum creative flexibility for feature movie production. The camera provides 16-bit linear RAW outputs to be recorded onto SRMemory™ cards by the SR-R4 on-board SRMASTER recorder. In this mode, the entire image information captured with the 20 megapixel CMOS sensor is maintained as 16-bit linear RAW data without compressing highlight information by any log or gamma function. Since the entire tonal range and color information of the F65 camera can be transferred to post production, colorists are given enormous headroom in achieving the desired look in DI (Digital Intermediate). The F65RAW files can be easily converted to HD, 2K, or 4K RGB files using a choice of software tools.

Choice of Three Recording Modes

Users can select from three recording modes – F65RAW-SQ, F65RAW-Lite, and F65RAW-HFR – to best accommodate different user needs on the picture quality, recording time, and desired look.
The F65RAW-SQ mode employs a mild compression and is ideal when highest possible image quality is the priority. The F65RAW-Lite mode utilizes a higher compression that greatly extends the recording time by reducing the image file size. F65RAW-HFR mode allows the F65 with the SR-R4 to record over 24 minutes of 120p content on a single SR-1TS55 (1 TB) card.

HD SStP Mode

HD SStP mode has been developed to offer the best of both worlds – creative freedom and efficiency – both of which are essential to relieve the time and budget pressures that are typical in HDTV projects. The F65 camera contains an internal processing system to create RGB HD files (1920 x 1080) to be stored as 10- or 12-bit RGB 444 or 10-bit 422 MPEG-4 SStP files on SRMemory cards via the SR-R4 on-board recorder*. Combined with the S-Log gamma function, HD SStP mode allows the SR-R4 to record the entire tonal range of the F65 camera, while significantly reducing image file size. In this mode, the F65 camera with the SR-R4 fits into a conventional HD workflow and expands the possibilities of HD content production.

* HD SStP recording will be supported by a software upgrade.

Easy and Efficient

Many functions are designed to provide ease of use for efficient operation.

HD-SDI Output and SDI LUT

The F65 camera has built-in HD video processing hardware that enables users to monitor images on conventional HD viewfinders and/or HD monitors connected via HD-SDI outputs. Utilizing a SDI LUT (Look-up table) function, users can allocate any LUT for HD-SDI output to view pictures with suitable color and contrast. Furthermore, a x2/x4 magnification function facilitates critical focusing checks.
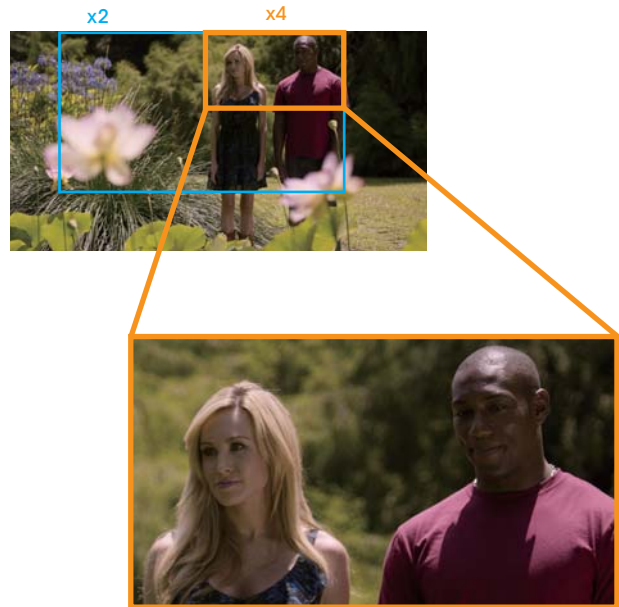
4K pixel to pixel focus

F65Remote

When an optional Wi-Fi adapter, CBK-WA01*, is connected to the USB port of the F65, users can also perform wireless camera control operation and status checks from a tablet device such as Sony Tablet™ S Series or an Apple iPad2**. After installing free specialized software called F65Remote in the tablet device, users can intuitively change camera settings (for example, the shutter speed, frame rate, and Rec On/Off) and check the shooting status remotely via a large touch-screen panel.

  * Requires an optional CBK mounting bracket to be connected to the F65. No upgrade key (CBKZ-UPG01/CBK-UPG01) is required.
** An iOS version is now available from App Store; an Android version will be available from Android Market later.

F65Remote

Wi-Fi

SRNavi

SRNavi is web-based application software that runs on tablet devices* to check the maximum recording time on each SRMemory card in a selected recording format to find a suitable card. Users can operate this software off-line once the application is downloaded via the internet (except when refreshing cache memory).
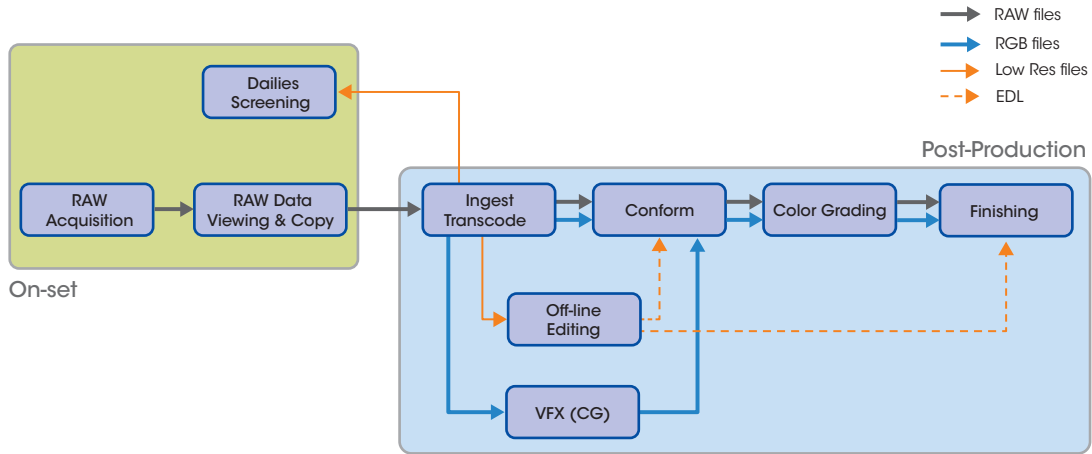
* Supported tablet devices: iPad, iPod Touch, iPhone, and Android devices.

File-based Workflow

The **F65** offers a simple and speedy file-based workflow suitable for the most demanding production environments.

Total Workflow

RAW Data Viewing

F65RAW files recorded on SRMemory cards can be reviewed on an HD monitor connected to an SR-PC4/SRPC-5 data transfer unit. In addition, when a Microsoft Windows PC or Apple Mac is connected to the unit via GbE, it can be easily operated by a web-based GUI (SRControl), without installing specialized software. Users can play and stop clips, transfer files to the network, display a clip list, and check and change metadata.
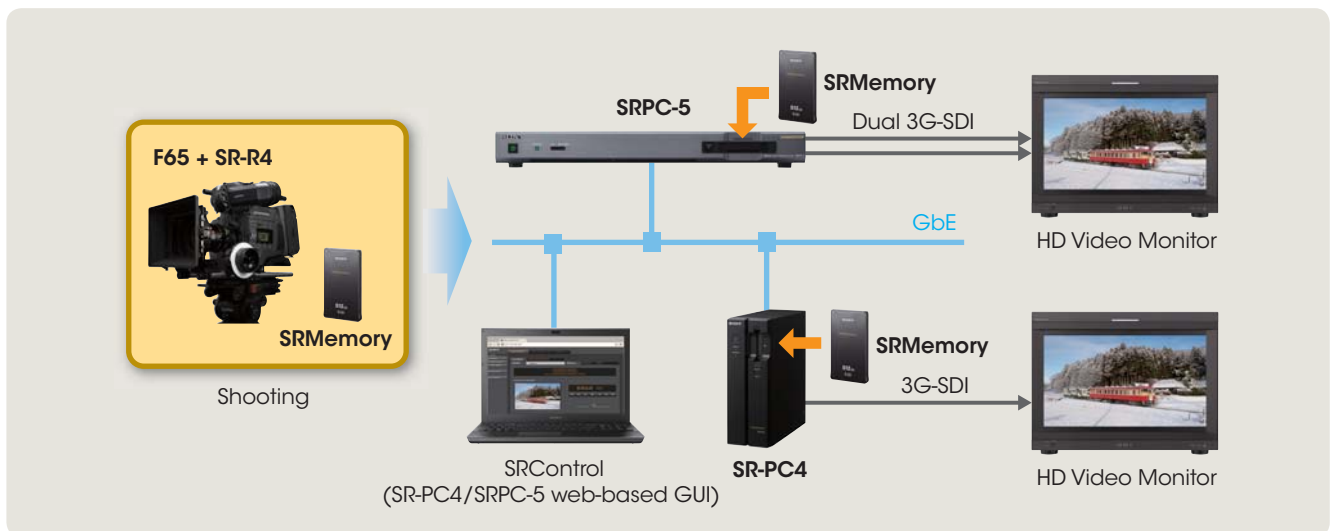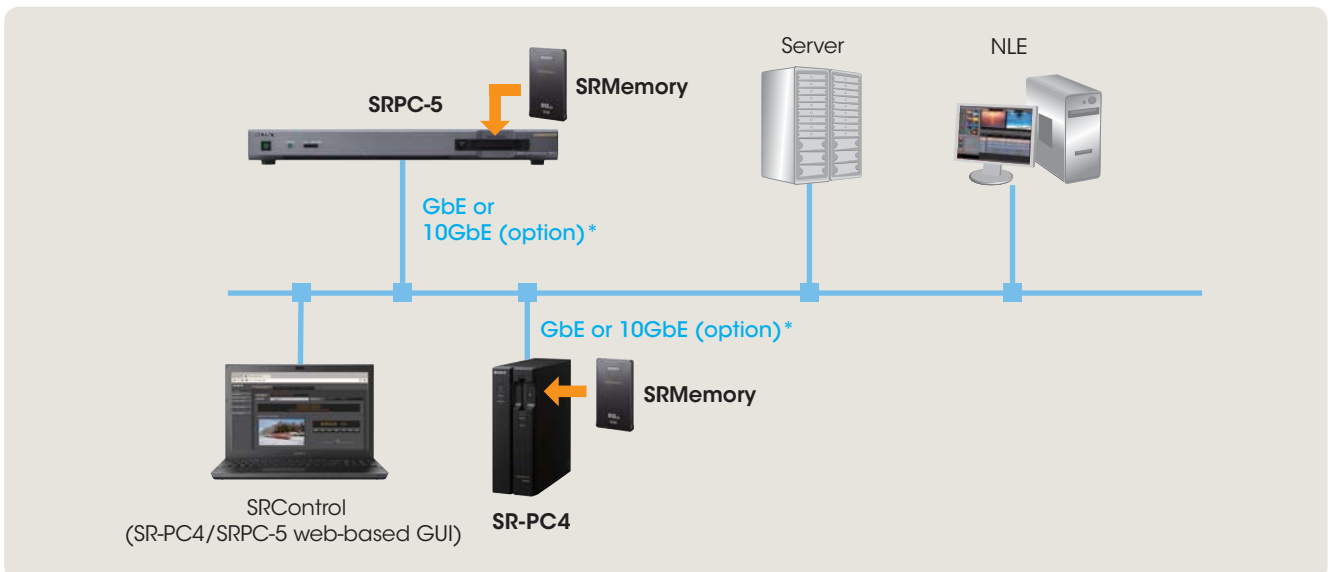
RAW Data Copy

The SR-PC4/SRPC-5 facilitates backup of files recorded on SRMemory cards. After installing a recommended eSATA card (host) into the PCIe expansion slot of the unit, and connecting it to a hard disk with an eSATA interface, users can duplicate files to hard disk using SRControl on a Microsoft Windows PC or Apple Mac via GbE connection. High-speed data transfer is executed via eSATA.

SRPC-5 · SRMemory · eSATA (option)* · GbE · SRControl (SR-PC4/SRPC-5 web-based GUI) · SRMemory · eSATA (option)* · SR-PC4 · HDD with eSATA I/F
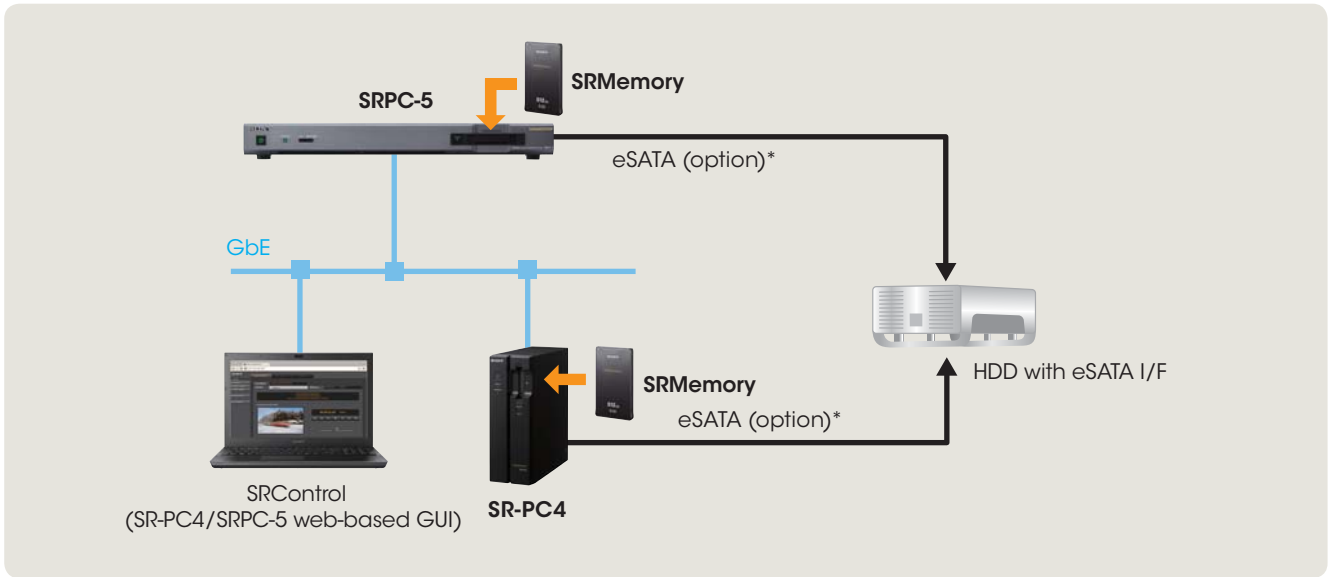
* Requires a third-party eSATA PCIe card.

High-speed Ingest

File transfer of materials recorded on SRMemory cards can be achieved via a GbE network equipped with the SR-PC4/SRPC-5 data transfer unit. Furthermore, when a third-party 10GbE network interface card is installed into the PCIe expansion slot, this unit enables file transfer at much higher speeds.

SRPC-5 · SRMemory · Server · NLE · GbE or 10GbE (option)* · SRControl (SR-PC4/SRPC-5 web-based GUI) · GbE or 10GbE (option)* · SRMemory · SR-PC4

* Requires a third-party PCIe card for 10GbE file transfer.

Newly introduced with the F65 camera, SRMASTER is a next-generation storage format specifically designed to satisfy creators' increasing demands. A variety of products are available in the line-up to enable effective end-to-end workflow.

SRMemory

The SRMemory card is an ultra-high-speed, high-capacity, and high-reliability flash memory media for SRMASTER Series products. It is ideal for demanding professional applications including high-resolution digital cinematography, high-frame-rate recording, and 3D production. The SRMemory card line-up includes three speeds and three capacities in six different models to best accommodate the full range of user requirements. Thanks to its sustained data throughput, the SRMemory card can record and playback multiple streams simultaneously, and supports data rates that can handle up to 4K*.

*Depending on the data rate of the recording signal (such as 4K, dual-stream, and I/O configuration), usable SRMemory card may be limited.

SRMemory

Maximum Recording Time (Approximate)

Unit: min

SR-R4 Supported Format				SRMemory Card					
				SR-256S15	SR-512S25	SR-1TS25	SR-256S55	SR-512S55	SR-1TS55 **
				1.5 Gbps	2.5 Gbps	2.5 Gbps	5.5 Gbps	5.5 Gbps	5.5 Gbps
RAW/HD	Bit Depth	Recording Mode	Frame Rate	256 GB	512 GB	1 TB	256 GB	512 GB	1 TB
F65RAW	16-bit Linear	F65RAW-Lite*	23.98p/24p	25	50	101	25	50	101
			25p	24	48	97	24	48	97
			29.97p	20	40	81	20	40	81
			59.94p/60p	N/A	N/A	N/A	10	20	41
		F65RAW-SQ	23.98p/24p	N/A	30	61	15	30	61
			25p	N/A	29	58	14	29	58
			29.97p	N/A	N/A	N/A	12	24	48
			59.94p/60p	N/A	N/A	N/A	6	12	24
		F65RAW-HFR*	119p/120p	N/A	N/A	N/A	6	12	24
HD SStP*	4:2:2 10-bit	SR-Lite	23.98PsF	142	285	572	142	285	572
			25PsF	137	274	549	137	274	549
			29.97PsF	114	228	457	114	228	457
			50p	72	144	290	72	144	290
			59.94p/60p	60	120	241	60	120	241
	4:2:2 10-bit	SR-SQ	23.98PsF	75	150	302	75	150	302
			25PsF	72	144	290	72	144	290
			29.97PsF	60	120	241	60	120	241
			50p	38	76	153	38	76	153
			59.94p/60p	32	64	128	32	64	128
	4:4:4 10-bit	SR-SQ	23.98PsF	75	150	302	75	150	302
			25PsF	72	144	290	72	144	290
			29.97PsF	60	120	241	60	120	241
			59.94p/60p	32	64	128	32	64	128
	4:4:4 10-bit 4:4:4 12-bit	SR-HQ	23.98PsF	40	80	160	40	80	160
			25PsF	38	76	153	38	76	153
			29.97PsF	32	64	128	32	64	128
			59.94p/60p	16	32	65	16	32	65

* F65RAW-Lite, F65RAW-HFR and HD SStP recording will be supported by a software upgrade.
** SR-1TS55 card will be available in summer 2012.

SR-R4 Portable Memory Recorder

The SR-R4 is exclusively designed as the companion dockable recorder for the F65 camera. It takes full advantage of the ultra-high-speed SRMemory platform to record RAW data from the F65 camera at an unprecedented data rate up to 5.5 Gbps. Furthermore, HD recording in the MPEG-4 SStP format is also offered with the F65 and SR-R4 for HDTV program production.

Main Features

• Direct docking to the F65 camera; no external cable required
• F65RAW (16-bit linear RAW) recording
• 60 minutes of RAW recording onto a 1 TB SRMemory card at 24 fps
• HD MPEG-4 SStP recording*
• Select FPS – variable frame rate image capturing from 1 fps to 120 fps**
• Up to 16 channels of 24-bit audio recording*
• Two channels of analog audio inputs
• Timecode In/Out
• Control panel (option: SRK-CP1)

  * Will be supported by a software upgrade.
** 61 fps to 120 fps and variable frame rate recording will be supported by
    a software upgrade.

SR-PC4 Memory Data Transfer Unit

The SR-PC4 is an SRMemory data transfer unit specifically designed for the on-set production environment. It can be smartly integrated into commodity PC-based production tools such as on-set dailies systems and color grading systems. Materials shot by the F65 camera can be instantly reviewed via the SR-PC4 web-based GUI (SRControl) immediately after shooting.

Main Features

• SRMemory READ/WRITE*
• Fast data transfer from SRMemory card to servers and/or
  NLEs via GbE or an optional 10GbE** network interface;
  files and clips can be easily browsed using the SR-PC4 GUI
• F65RAW monitoring via HD-SDI connection
• Direct data copy to shuttle drives via an optional eSATA
 (host)** interface

  * SRMemory WRITE will be supported by a software upgrade.
** Requires a third-party PCIe card.

F65RAW Viewer

F65RAW Viewer is a free application to view video clips shot with the F65 and SR-R4. Other than viewing clips, it supports F65 workflow with variable functions. Features of the F65RAW Viewer are as follows.
• Browse clips and metadata shot with the F65 and SR-R4
• View clips in a selected resolution: 4K, QFHD, 2K, or HD
• Develop RAW data and convert it to RGB data by batch processing
• Primary color grading, and adjust sensitivity, color temperature, and look control
• Export files in DPX: 10/16-bit, 4096 x 2160/3840 x 2160/2048 x 1080/1920 x 1080 or OpenEXR: 32-bit float, 4096 x 2160/3840 x 2160/2048 x 1080/1920 x 1080
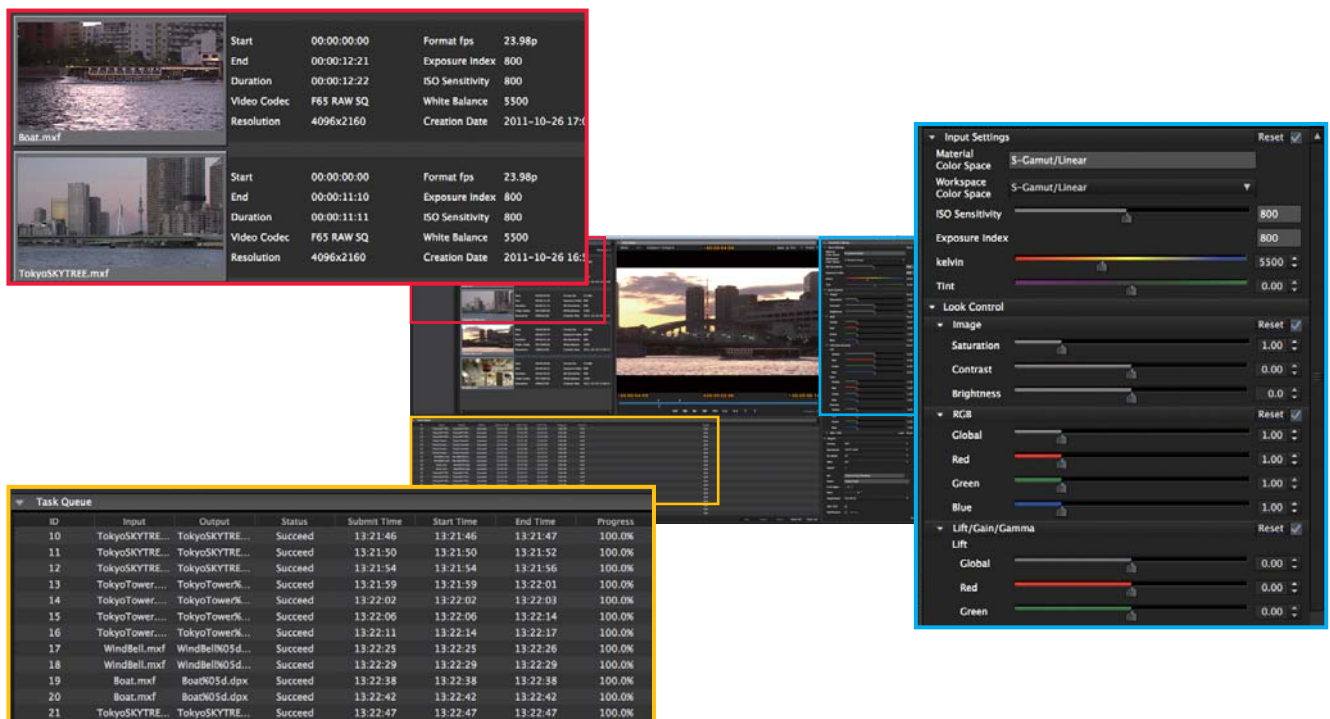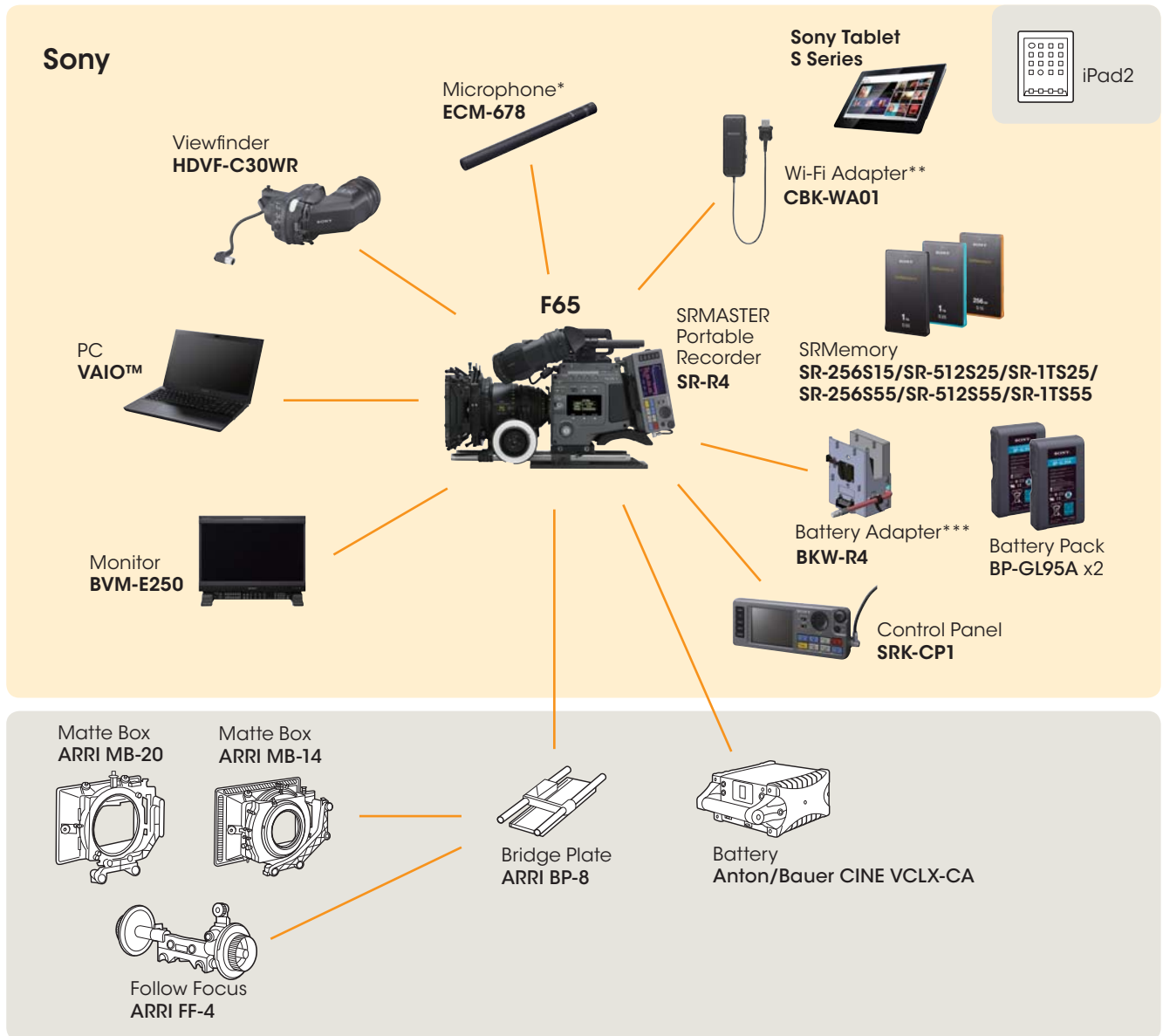

Digital Intermediate

Various companies provide several digital intermediate solutions. If a third-party wishes to develop its own solution, Sony will supply an SDK; please refer to the following license program.

SRMASTER License Program:

Sony offers a license program to support third-party development for the SRMASTER format.
The program includes supply of technical documents and an SDK.
For more information, please contact: **sr-license@jp.sony.com**

Optional Accessories

Sony

Viewfinder
HDVF-C30WR

Microphone*
ECM-678

Sony Tablet S Series

iPad2

Wi-Fi Adapter**
CBK-WA01

F65

SRMASTER Portable Recorder
SR-R4

SRMemory
**SR-256S15/SR-512S25/SR-1TS25/
SR-256S55/SR-512S55/SR-1TS55**

PC
VAIO™

Battery Adapter***
BKW-R4

Battery Pack
BP-GL95A x2

Monitor
BVM-E250

Control Panel
SRK-CP1

Matte Box
ARRI MB-20

Matte Box
ARRI MB-14

Bridge Plate
ARRI BP-8

Battery
Anton/Bauer CINE VCLX-CA

Follow Focus
ARRI FF-4

  * Requires an optional microphone holder to be attached to the F65.
 ** Requires an optional Wi-Fi mounting bracket to be connected to the F65. No upgrade key (CBKZ-UPG01/CBK-UPG01) is required.
*** Will be available in summer 2012.

Optional Parts

CBK Bracket

A-418-596-01 Wi-Fi Mounting Bracket

Extension Cables for SRK-CP1

1-829-412-11 (1.8 m)	1-832-382-11 (20 m)
1-832-381-11 (10 m)	1-838-003-11 (50 m)

Parts for ND Filters

A-1617-046-A Filter Base Assy
A-1675-958-A Sub Filter Base Assy

Shims

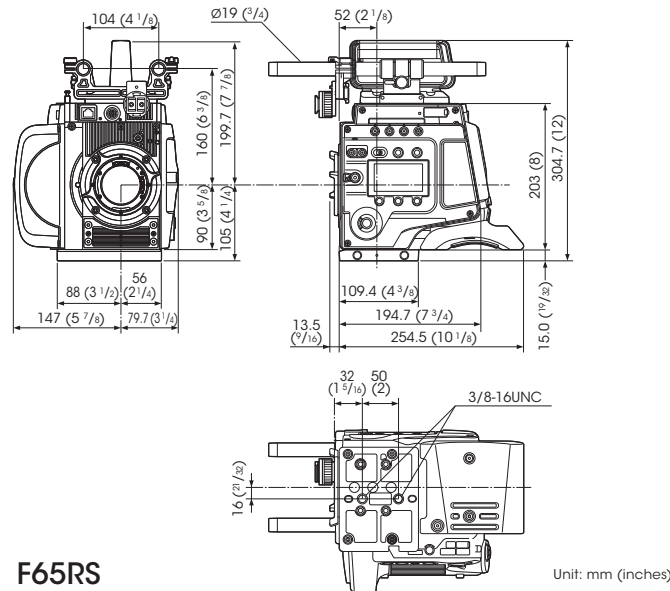|	
4-260-711-02	0.02 mm (0.0008 inch)
4-260-711-12	0.03 mm (0.0012 inch)
4-260-711-22	0.04 mm (0.0016 inch)
4-260-711-32	0.05 mm (0.0020 inch)
4-260-711-42 (standard)	0.06 mm (0.0024 inch)
4-260-711-52	0.07 mm (0.0028 inch)
4-260-711-62	0.08 mm (0.0032 inch)
4-260-711-72	0.09 mm (0.0036 inch)
4-260-711-82	0.10 mm (0.0040 inch)

Specifications

General	
Power Requirements	DC 10.5 V to 17 V
Power Consumption	Approx. 65 W at 23.98 PsF mode (Mechanical rotary shutter operating, without lens, viewfinder) (F65RS)
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	–20°C to +60°C (–4°F to +140°F)
Mass	5.0 kg (6.5 kg with accessories) (11 lb (14 lb 5 oz with accessories)) (F65RS)

Imager	
Imager	Super 35-mm CMOS image sensor (Total 20 megapixels)
Method	Single sensor
Aspect Ratio	17:9
Sensor Size	24.7 x 13.1 mm (1 x 1/2 inches), diagonal 28.0 mm (1 1/8 inches)

Electrical Characteristics	
Latitude	14-stop
ISO Sensitivity	ISO800
Shutter Angle	4.2° to 360° (Electrical shutter), 11.2° to 180° (Mechanical rotary shutter)

Optical System Specifications	
Lens Mount	PL Mount
Flange Focal Length	52.00 mm (±0.04 mm adjustable in 0.01 mm increments by shim replacement)

Input/Output Connectors	
DC Input	LEMO 8-pin male (x1), DC 10.5 V to 17 V, 20 V to 30 V
DC Output	12 V: 11-pin (x1), DC 12 V, 4 A maximum 24 V: 3-pin (x1), DC 24 V, 4 A maximum (The usable current may be limited depending on the load and input conditions.)
Viewfinder	20-pin (x1)
Lens	12-pin (x1)
SDI OUT	BNC (x2), HD-SDI signal, 4:2:2, BTA-S004A-compliant, 75 Ω, 0.8 Vp-p, 1.485 Gbps
HD-Y OUT	BNC (x1), 75 Ω, 1.0 Vp-p
Genlock Input	BNC (x1), 75 Ω, SMPTE 274M HD 3-level sync, 0.6 Vp-p
Remote	8-pin (x1)
External Input/Output	LEMO 5-pin, female (x1)
Ethernet	RJ-45 type (x1), 10BASE-T, 100BASE-TX
Lens Mount Hot Shoe	4-pin (x2), conforming to ARRI LDS (Lens Data System) and Cooke /I Intelligent Electronic Lens System
USB	Type A, USB2.0 Hi-Speed (x1)
"Memory Stick™" (MS)/SD Memory Card	Combo-connector (x1) Supports "Memory Stick Duo™", "Memory Stick PRO Duo™" Supports SD memory cards, SDHC memory cards up to class 10

Supplied Accessories	
	+B3 × 5 screws (4), Cable clamp belt (1), Belt bracket (1), Power cable connector (LEMO 8-pin) (1), Operation guide (1), Operation manual (CD-ROM) (1)

The F65 and the SR-R4 are classified as a CLASS 1 LASER PRODUCT.

Dimensions

F65RS

Unit: mm (inches)