

Camera Systems



A Live Experience – with surgiCam®

The medical camera system from KLS Martin



Taking the observer close to the operating table **surgiCam[®]**

Communication and information nowadays play a vital role in many surgical, endoscopic and other imaging interventions and procedures. Specifically, digital image documentation of surgical procedures and live operations are increasingly gaining importance.

surgiCam[®] from KLS Martin gets you directly in touch with what's happening in the OR – live. In conjunction with our marLux[®] and marLED[®] operating light generation, the digital camera system offers you everything you need for visualization and image transmission of entire surgical procedures.

You have the choice.

surgiCam[®] can either be integrated into the center of a marLux[®] and marLED[®] light head or installed on a separate suspension arm. This ensures an excellent view of the surgical site for any intervention.

surgiCam[®] comes in a modular and highly flexible design so you can easily tailor this versatile system to your specific needs. All variants feature a CCD-chip camera with 300x zoom (26x optical) capable of capturing even the smallest image details. Motorized image erection – a function that ensures laterally correct image display on the screen – is optionally available as well. In other words, time-consuming camera or light adjustments by the surgical staff are definitely a thing of the past.

The Low-Cost Single Solution The Economy Version

The Economy version allows you to control the zoom and image erection functions directly via the operating light's control panel. No other control units required.

Via a TFT monitor, the surgical procedure is visualized for the entire team. Besides, an S-video interface ensures the convenient recording or processing of the video signals.



It's that simple. The surgeon positions the light head as required for the intervention. This also focuses the camera located in the light head's optical axis on the surgical site – an automatic process (1). In addition to light control, the control panel (2) allows you to adjust the zoom and display a laterally correct image on the monitor screen (3).

Technical data *surgiCam® SD*

KLS Martin <i>surgiCam® digital</i>	Technical Data
Image sensor	1/4" Super HAD CCD chip
TV standard	PAL (optionally NTSC)
Pixels	PAL 752 (H) x 582 (V), NTSC 768 (H) x 494 (V)
Horizontal resolution	> 460 TV lines
Line frequency	PAL 15,625 Hz, NTSC 15,750 Hz
Image/frame frequency	50 Hz, 60 Hz
Automatic shutter	1/1 – 1/10,000 s
Minimum illumination	3 lux
Signal-to-noise ratio (SNR)	50 dB
Zoom	300x (26x optical + 12x digital)
Focal length (zoom lens)	3.5–91 to 60 mm
Iris/aperture	F 1.6–3.8
White balance	automatically
Ambient temperature	0°C to 45°C (32–122°F)
Control unit signal outputs, analog	2 x S-video (Y/C), 2 x Composite (color video signal)
Power requirements: control unit / camera	100–240 V, 50/60 Hz / 6–12 V DC
Power input: control unit / camera	max. 24 W / approx. 6 W
Camera weight	approx. 0.85 kg
Dimensions: control unit (complete)	270 x 120 x 280 mm (W x H x D)
Control unit weight	approx. 2 kg
Protective conductor (PE) terminal	⊖
Protection class	I
Type B	⚡
Mark of conformity	CE (in conformity with 93/42/EEC)
Compatibility	with marLux® and marLED®
Increased patient safety	Galvanic isolation of input and output signals (≥ 4 kV)

Convenient and Brilliant The Basic Version

The Basic version offers you excellent image quality along with a separate, user-friendly control unit that can be installed either on the platform of a ceiling-mounted supply-and-suspension system or on an equipment trolley. It provides you with a number of additional control functions.

surgiCam® basic version – either mounted on a separate suspension arm for extremely flexible positioning of the camera, or integrated into the handle of the operating light where space is scarce. Both versions are controlled via the separate surgiCam® control unit.



The surgiCam® control unit allows manual as well as automatic control of all camera functions.

surgiCam® HD Camera Eagle eyes in the OR

Full HD
1080

High-quality daylight alone is not enough for surgical site illumination. The HD camera technology offers you more detail and thus a precise image of even the most delicate tissue structures.



Thanks to the easy visualization of tissue changes, the HD camera provides the surgeon with valuable diagnostic support.

Telemedical data transmission for large-format display (as required for lecture halls, for example) also benefits from HD image sequences, as the pictures are much sharper in detail than in conventional SD formats.

All KLS Martin operating lights of the marLux® and marLED® series can be equipped with the high-resolution *surgiCam® HD* camera system. At your option, the camera can be mounted on a suspension arm of its own or integrated within the sterilizable central handle of the operating light. With *surgiCam® HD*, you get professional image quality in the “Full HD 1080i” format boasting 2 million pixels.

Upgrade levels

- For function control – zoom and image rotation – via the control panel of the operating light
- For convenient control of all camera functions via a separate control unit. Video signal and control signal interface via combination wall socket
 - HD-SDI digital video signal via BNC socket
 - Control signals via multiple DIN socket
- 120x zoom (10 x optical / 12 x digital)
- Full HD video output



The *surgiCam® HD* control unit allows manual as well as automatic control of all camera functions.

Basic

- Zoom
- Image rotation (“light head” version only)
- Manual focus and auto-focus
- Manual and automatic shutter
- Servomotorized image erection function, remote-controllable (only in the light head)
- White balance
- On separate arm or integrated into light head

surgiCam® HD – eagle eyes in the OR

- For teleconsultations
- For live transmissions (for education and training)
- For documenting surgical procedures
- Maximum image quality with 2 million pixels in full HD resolution
- HD-SDI digital video signal
- 100% interference-free transmission to external storage media
- No image interference caused by electrosurgery
- 120x zoom
- Available in 2 installation versions:
 - on separate arm
 - integrated into the sterilizable central handle of the operating light, for all marLux® and marLED® lights



Technical data surgiCam® HD

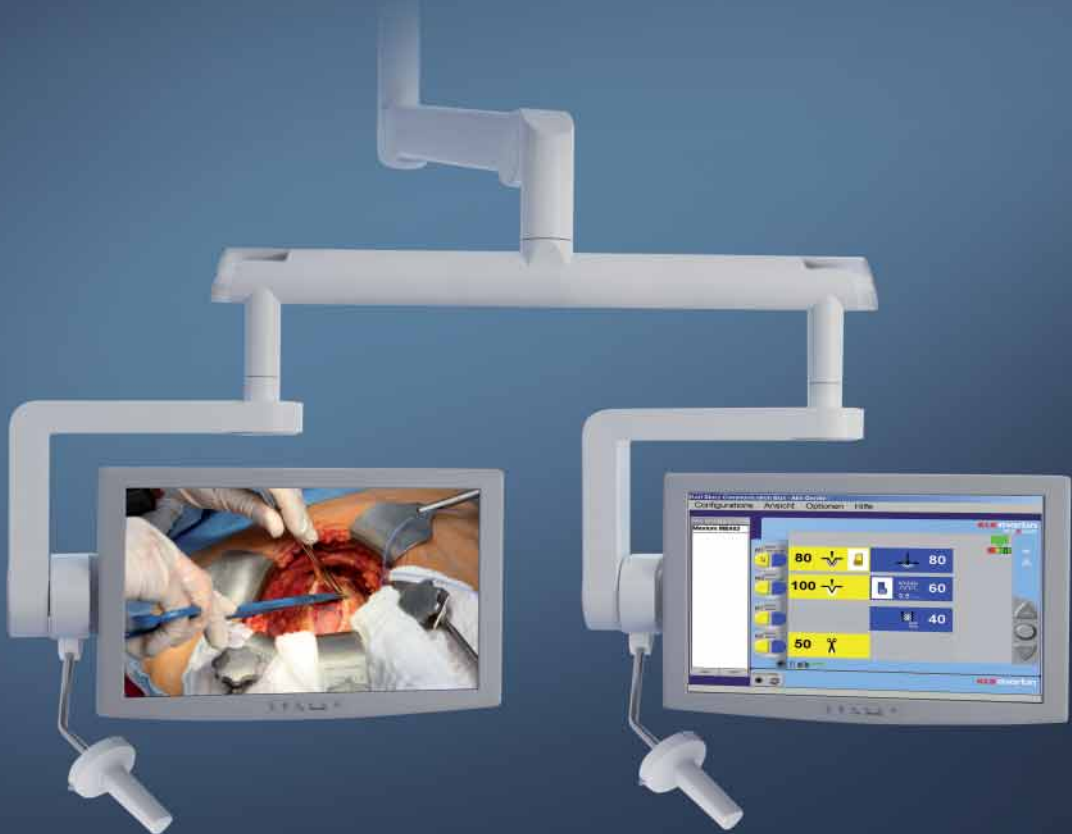
Feature	Technical Details
Image sensor	1/3" CMOS
Number of pixels	1920 x 1080i
Effective pixel number	approx. 2,000,000
Signal system	Standard: 1080i / 50 Hz Optional: 1080i / 59.94 Hz 720p / 50 Hz, 720p / 59.94 Hz
Aspect (height-to-width) ratio	16 : 9
Minimum illumination	25 lx
Signal-to-noise ratio (SNR)	> 50 dB
Zoom	10x optical / 12x digital
Focal length (zoom lens)	f = 5.1 mm to 51 mm
Shutter	1/2 bis 1/10.000 s
White balance	automatic
Ambient temperature	0°C–45°C (32°F–113°F)
Ambient temperature during operation	0°C–45°C (32°F–113°F)
Power requirements: control unit / camera	100–240 V, 50/60 Hz / 6–12 V DC
Protection class	I
Equipotential	yes
Power input: control unit / camera	max. 24 W / approx. 4.8 W
Camera dimensions	131 x 88 mm (length x diameter)
Weight of camera installed in light head	approx. 1 kg
Weight of camera mounted on separate arm	approx. 0.8 kg
Dimensions of control unit (complete)	270 x 120 x 280 mm (W x H x D)
Weight of control unit	approx. 2 kg
Compatibility	marLux® and marLED® operating lights
Mark of conformity	CE
Wall socket connector standard	3 x BNC socket for video signal 1 x multiple DIN socket for control signals

Distinctive features: SD vs. HD

	SD	HD
Resolution	720 x 576 pixels	1920 x 1080 pixels
Contrast	good	excellent
Aspect (height-to-width) ratio	4:3	16:9
Color differentiation	good	excellent

The Essentials at a Glance: TFT monitors marView and Eco

TFT monitors are not only light-weight and compact, but offer excellent image quality as well. Integration into a ceiling-mounted multi-light set-up provides maximum flexibility in positioning the monitor according to specific needs.



The advantages of a monitor plus suspension system combination are in fact easy to see: high mobility, low weight, plus easy handling thanks to an optionally available stop-free suspension.

First-rate image quality is guaranteed by high resolution and a high frame frequency. Together with advanced interfaces for digital data transfer, the TFT monitors are bound to satisfy the highest demands in terms of image sharpness and fidelity, especially in endoscopy.

Technical data TFT monitors

Product	Features	Signals/Interfaces Outputs	Signals/Interfaces Inputs
Radiance 24" (w/o fiber-optic input, item no. 84-200-36-04)	Resolution 1920 x 1200, response time 5–12 ms Types of voltage 24 VDC Weight 7.3 kg High-quality endoscopy display with HD-SDI interface PIP (picture-in-picture) mode and other features	1x DVI-D loop (DVI socket) 1x S-video loop (mini DIN) 1x HD-SDI loop (BNC)	1x DVI-I (DVI socket) 1x DVI-D (DVI socket) 1x VGA (D-sub, 15-pole) 1x S-video (mini DIN) 1x S-video (2x BNC) 1x composite color video signal (BNC) 1x YPbPr (3x BNC) 1x RGBS (3x BNC) 2x HD-SDI (BNC) 1x RS232 (D-sub, 9-pole)

Product	Features	Signals/Interfaces Outputs	Signals/Interfaces Inputs
Radiance 24" (with fiber-optic input, item no. 84-200-38-04)	Resolution 1920 x 1200, response time 5–12 ms Types of voltage 24 VDC Weight 7.3 kg High-quality endoscopy display with HD-SDI interface PIP (picture-in-picture) mode and other features with LWL interface	1x DVI-D loop (DVI socket) 1x S-video loop (mini DIN) 1x HD-SDI loop (BNC)	1x DVI-I (DVI socket) 1x DVI-D (DVI socket) 1 x DVI via fiber optic 1x VGA (D-sub, 15-pole) 1x S-video (mini DIN) 1x S-video (2x BNC) 1x composite color video signal (BNC) 1x YPbPr (3x BNC) 1x RGBS (3x BNC) 2x HD-SDI (BNC) 1x RS232 (D-sub, 9-pole)

Product	Features	Signals/Interfaces Outputs	Signals/Interfaces Inputs
Radiance 26" (with fiber-optic input, item no. 84-200-27-04)	Resolution 1920 x 1200, response time 5–12 ms Types of voltage 24 VDC Weight 8.2 kg High-quality endoscopy display with HD-SDI interface PIP (picture-in-picture) mode and other features with LWL interface	1x DVI-D loop (DVI socket) 1x S-video loop (mini DIN) 1x HD-SDI loop (BNC)	1x DVI-I (DVI socket) 1x DVI-D (DVI socket) 1 x DVI via fiber optic 1x VGA (D-sub, 15-pole) 1x S-video (mini DIN) 1x S-video (2x BNC) 1x composite color video signal (BNC) 1x YPbPr (3x BNC) 1x RGBS (3x BNC) 2x HD-SDI (BNC) 1x RS232 (D-sub, 9-pole)

Flexibility is the Word
The Suspension Systems

KLS Martin offers flexible suspension arm systems for TFT monitors in conjunction with operating lights or ceiling-mounted supply-and-suspension systems. Large working ranges, height adjustment by spring-load balancing, sterile positioning via an exchangeable, sterilizable handle – all of them system hallmarks. To eliminate the inconvenience caused by arm rotation stops, the signal lines are routed through slip rings wherever possible. An extract of our program is listed on page 11. More versions available in our price list.



Overview suspension systems

Designation	Stop	Slip rings, poles	Sterilizable handle	Spring arm type	Load capacity	Rotary canopy	Max. possible wiring	Notes	Illustration
Light-duty equipment suspension arm, bottom position, marView for monitors from 19" up to 26"	yes	2 x 10 mm	yes	AC2000	11 kg	no	e.g. 1 x power supply, 1 x VGA, 1 x S-VHS, wire pull		
Heavy-duty equipment suspension arm, bottom position, marView for monitors from 19" up to 26"	yes	24 mm	yes	AC3000	11 kg	no	e.g. 1 x Power, 1 x VGA, 1 x S-VHS, wire pull		
Light-duty equipment suspension arm, top position, marView for monitors from 19" up to 26"	yes	2 x 10 mm	yes	AC2000	11 kg	yes	e.g. 1 x Power, 1 x VGA, 1 x S-VHS, wire pull		
Heavy-duty equipment suspension arm, top position, marView for monitors from 19" up to 26"	yes	24 mm	yes	AC3000	11 kg	yes	e.g. 1 x Power, 1 x VGA, 1 x S-VHS, wire pull		
Heavy-duty equipment suspension arm, top position, with dual TFT support for "Duo TFT" marView for monitors up to 26"	yes	24 mm	yes	Onda Space	2 x 11 kg	yes	e.g. 2 x power supply, 2 x VGA, 2 x S-video, 1 x control signal lead, wire pull	Tracking/extension arm always third length (= 1,100 mm)	
Light-duty equipment suspension arm, bottom position, with "Eco" TFT suspension arm	yes	2 x 10 mm	no	AC2000	13 kg	no	e.g. 1 x Power, 1 x control signal lead,		
Light-duty equipment suspension arm, top position, with "Eco" TFT suspension arm	yes	2 x 10 mm	no	AC2000	13 kg	yes	z.B. 1 x Power, 2 x S-VHS, wire pull		
Heavy-duty equipment suspension arm, top position, with dual TFT support for "Duo TFT", "Eco" for monitors up to 26"	yes	24 mm	no	Onda Space	2 x 11 kg	yes	e.g. 2 x power supply, 2 x VGA, 2 x S-video, 1 x control signal lead, wire pull	Tracking/extension arm always third length (= 1,100 mm)	

Further options on request

"marView" with closed cable duct, CG-neutral, with max. swiveling range and **sterilizable** handle
 "ECO" version: lockable tilt joint, stainless steel handle (**non-sterile**)

All suspension systems VESA 75/100-compatible
 * Max. load capacity on request: 25 kg



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