

TECHNICAL SPECIFICATIONS

CAMERA SYSTEM

Transmission system	PAL/NTSC
Pick-up device	3x2/3-inch Philips Frame Transfer CCD's (LDK 20S with DPM)
Smear performance	No vertical smear
Aspect ratio	LDK 20 = 4:3
Picture elements	LDK 20S = 4 :3 / 16:9 switchable 4:3 and 16:9 aspect ratio: NTSC: 1000(h) x 498(v) PAL: 1000(h) x 594 (v)
Optical System	F1.4 with quartz filter
Optical filters	Exchangeable filtercassette with remote selectable 6 positions: Clear; ND 0.6; ND 1.2; ND 1.8; 4-point star; 6-point star

VIDEO PERFORMANCE

Video Processing	HiRes Digital Processing with 12 bit A/D and > 20 bit internal processing
Digital features	Flare; White/Black Shading; Contrast; Highlight Handling; 6 point var. Matrix; Matrix-pos.; Gamma; Gamma Curve; Contour include Dual Skin detail automatics and Extended Knee Contour; Leaking Pixel Corr.; VF video 2000 lux @ F8.0 Condition: 3200K, refl. 89.9%, 0dB gain
Sensitivity	Approx. 2 lux at F1.4 at +30 dB gain Typical: 61 dB PAL and 63 dB NTSC Remark: + 6 dB S/N improvement with High Resolution Digital Noise Slicer.
Min. illumination	Approx. 2 lux at F1.4 at +30 dB gain
S/N ratio at nom. gain	Typical: 61 dB PAL and 63 dB NTSC Remark: + 6 dB S/N improvement with High Resolution Digital Noise Slicer.
Modulation depth	> 70% @ 5 Mhz in RGB Centre (equals Hor. Resolution of 850 TV lines 4:3 and 700 TV lines 16:9) Remark: >65% @ 5 Mhz in RGB Centre with High Resolution Digital Noise Slicer.
Registration	<25 ns (0,05%) in all three zones, normal operation and not including lens errors
Exposure control	Down to 1/1000s
Lighting control	NTSC: nominal, 60Hz + 4 Hz PAL: nominal, 50 Hz + 3Hz
Clean scanning	NTSC: between 61.1 and 151.0 Hz PAL: between 51.0 and 103.0 Hz

GENERAL DATA

Concept	Studio Triax Camera
Triax cable length	RGB transmission over 3000m with 14 mm cable (9,850ft with 0,55" cable)
Head weight (approx.)	23 kg (50,7 lb) excl.VF and lens
Head dimensions (lxhxw) in mm (inch)	367x305x240 (14,5x12,0x9,5)
Ergonomics	Protecting drawbars. Backlight menu buttons on Camera Control Panel
Operating ambient temperatures for Camera Head	-20 to +45° (-4 to 113°F)
Operating ambient temperatures for all other items	0 to +45°C (+32 to +113°F)
Stand alone power req.	115/230V ac + 15%
Utility power	Nom. 70VA Max. 200VA (cable/system dep.)
Power consumption (Head + VF)	80W

Power consumption (Average system)	250W, incl. Camera Head, VF, 70 VA utility, 700 m (2,297 ft) Triax cable and lens.
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AUDIO PERFORMANCE

Audio Channels	2 channels
Microphone power	Selectable 0/+12V/+48V
Input levels at Camera Head	-64 dB/-24 dB/0 dB
Output levels at Base Station	0/+6 dB

INTERCOM PERFORMANCE

Intercom Headset on Head	Cam.Man and separate Floor Man. (PAL-only), RTS channel (NTSC-only) for max. 2 Beltpacks ENG/PROD/PROGR
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Intercom Channels

Input levels at Camera Head	-64 dB/-24 dB
Output levels at Base Station	0/+6 dB

CONNECTORS CAMERA HEAD

Triax	Option: Fischer/ARD/Lemo/Trilock
AC Power	AC Power out: Euro (female)
Lens	36p
Viewfinder	15p D
Mic In (Audio)	2 x XLR3
Cam.man headset	Option: XLR5/Tuchel
Floor.man headset	PAL Option: XLR5/Tuchel NTSC RTS Beltpack conn. Option: 1 Vpp; 75 Ohm; BNC
Video out	1 Vpp; 75 Ohm; BNC
Genlock in	1 Vpp; 75 Ohm; BNC
VF-out	1 Vpp; 75 Ohm; BNC
TP-video out	1 Vpp; 75 Ohm; BNC
Ext. Camera Control	4p DATA
VTR	26p SMPTE
Scriptlight-power	3p Fisher and 4p XLR; 12V
AUX	11p; private data
Tracker	11p; Comm./Signalling

CONNECTORS BASE STATION

Triax	Option: Fischer/ARD/Lemo/Trilock
Power	AC-power conn.
Audio out	2x XLR3
Intercom	ENG/PROD/PROGR via 15p D-conn.
Signalling	Call/Tally R/Y via 15p D-conn
CVBS (3x)	1Vpp; 75 Ohm; BNC
RGB	700 mVpp; 75 Ohm; BNC
Y,R-Y, B-Y	700, 525, 525 mVpp; 75 Ohm; BNC
PXM	1 Vpp; 75 Ohm; BNC
WFM	1 Vpp; 75 Ohm; BNC
Serial Digital (2x)	Option: 800 mV; 75 Ohm; BNC
270 Mb/s	1 Vpp; 75 Ohm; BNC
Ext 1, 2	1 Vpp; 75 Ohm; BNC
Genlock in	1 Vpp; 75 Ohm; BNC
TP-video input	1 Vpp; 75 Ohm; BNC
Ext. Camera Control	4p DATA

VIEWFINDER

Type	7-inch B/W
Features	Channels: Y,R,G,B,-G,Ext1,Ext2, Mix Ext/Y,Picture in Picture; Crosshairs;Centrecross;Cursorbox; Safe area; Dig. Focus; Statusbar
Resolution	>700 TVL
Weight	7 kg (15.4 lb)
Power	30W

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Information subject to change without notice
Printed in the Netherlands
3122 787 33900

LDK 20 SERIES

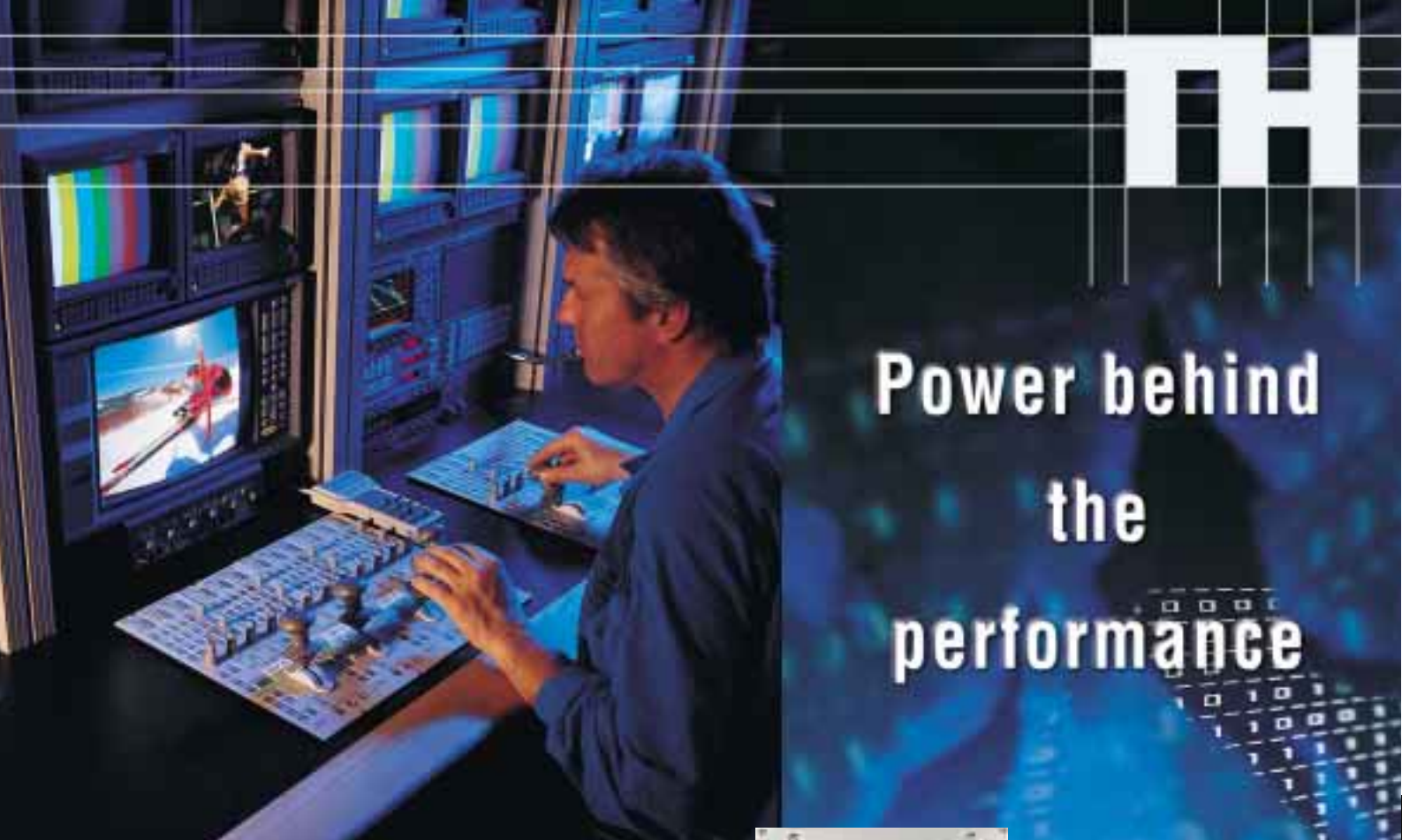
HIRES DIGITAL CAMERAS

WITH 12-BIT

A/D CONVERSION.

POWER THAT PUTS

YOU IN FRONT.



Power behind the performance

SERIES 9000 UNIVERSAL CAMERA CONTROL SYSTEM

Whether programs demand a simple one-camera set-up, or a complex multi-camera configuration with both digital and analog units, the Series 9000 Universal Camera Control System puts you in full control.

Easy to use and highly flexible, the system couples the digital control technology with facilities like Customer File, Transfer File and Common Control. Enabling exceptional creative freedom, whatever the production.

The complete Control System comprises a data switch, two types of Master Control Panel (MCP), and Operational Control Panels (OCPs) plus a number of optional panels. The PCI interface can be used for direct storage of set-up data in a PC environment. Options include Mono Knob (iris/master black) and Color (paint) Control. These can be linked to the system via a Remote Control Interface. With the data switch it is possible to create a star-shaped system.



Connection between the system elements is by a 2-wire data line. The concept's flexibility also allows two or more MCPs to be included. Up to 15 assignable control panels can be used on the 2-wire loop-through or star-shaped data link. To ensure perfect matching of camera parameters in complex production set-ups, the menu driven MCPs have a memory card system. Each card stores production and scene file reference information for up to eight cameras. As an alternative, a Direct Access MCP is also available. It features an LCD screen and is designed for use with cameras in groups of 15. Both types of MCP provide easy to follow and execute information on their displays, covering operational set-up, maintenance and diagnostic data.



TRUER COLOR REPRODUCTION

The dual auto skin tone contour circuitry with the new cameras is superior to other systems, as it can handle 360° of the color vector (wider than the more familiar 90°!). For faithful skin tone reproduction, this is a big advantage. It is also a benefit in productions like outside broadcasts where surfaces such as grass need to look like grass, with a true color and a soft natural impression, in contrast to an environment with enhanced sharpness.

The full range of parameters available covers contour level, vertical, horizontal, coarse and fine ratio (variable peaking frequency), level dependency, soft contour, skin contour, skin view insertion (where non-skin areas are made colorless for the operators' ease of selection), skin detect, knee contour plus VF-contour and boost.

DYNAMIC LPX AND NO SMEAR

The optical block used with Philips FT sensors guarantees no smear even when looking into the sun.

Dynamic Leaking Pixel Correction (LPX) is yet another unique feature. When switched on, white pixel defects are automatically corrected with an advanced dynamic pixel correction algorithm that avoids the need for camera downtime whilst waiting for factory or service support.

So, if you're shooting for the stars, we made sure you see them in your video signal! The digital leaking pixel correction compares output of the Red, Green and Blue channel and looks at critical deviations. When needed, the deviating pixel is concealed by a weighted average of neighboring pixel values, making it impossible to see a defect.

Extras that keep you out in front camera functionality. The range of options for the new HiRes Digital cameras also includes a Picture in Picture (PIP) facility for the 7" viewfinder. It enables the operator to view any one of the return videos (presented in the user's choice from four positions) with-in the main camera viewfinder picture.

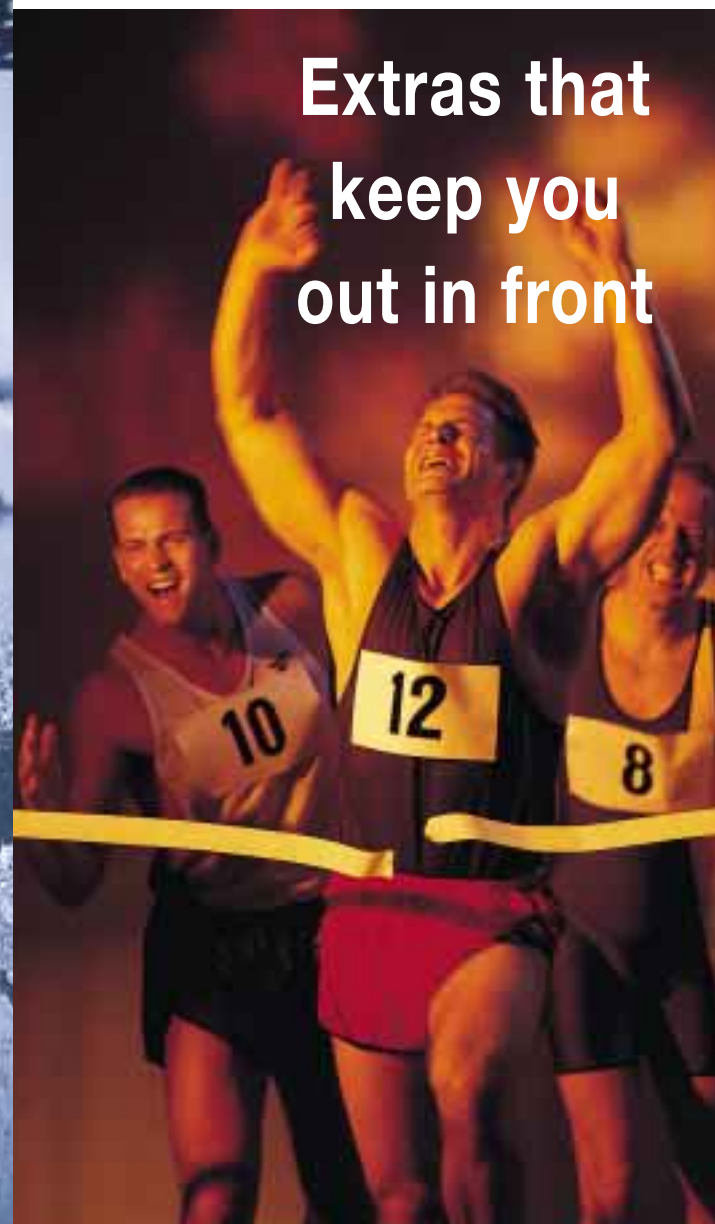
LONG DISTANCE SPECIALISTS

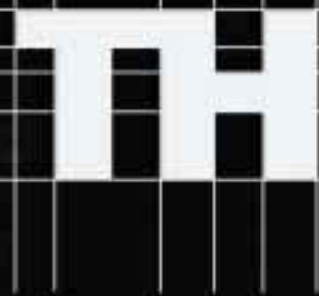
Created for integrated Triax operations, the LDK 20 Series is equally at home in the studio or out on location in an OB environment. All cameras can work up to 3,000 meters with full RGB. Together with the Series 4500 SlimLine Base-station, this makes them the ideal choice for sporting events. In addition, the bandwidth performance assures consistent standards of picture quality in applications where an excellent chroma key is needed, like in virtual studio operations.

EXTENDING YOUR CREATIVE OPTIONS

Further operational control versatility is possible using a Personal Computer Interface (PCI). A software program is available to help set-up dedicated control using Windows™ based software. This way you benefit from extensive and file management control facilities via a PC or laptop computer. It's a big help in storing files and group set-up routines, and it also makes the cameras truly creative tools.

Extras that keep you out in front





More
than
a
bit
better



LDK 20 Series advanced Digital Cameras with 12-bit A/D conversion

**THE FAMILY APPROACH
TO SUPERIOR PRODUCTIONS**

The LDK 20 Series, the LDK 20S and LDK 20 studio cameras and their EFP portable companion LDK 200DPM from Thomson, a family that represents today's most advanced camera concept. Bringing new levels of power and superior performance to every production. With 12-bit A/D video conversion and more than 20-bit HiRes digital internal processing. Both the LDK 20S and the LDK 200DPM feature award winning, no compromise Dynamic Pixel Management (DPM) © sensors, which enable remote two-way switching between 4:3 and 16:9.

The LDK 20 and LDK 200 DPM have unique Frame Transfer (FT) sensors in an optical block that assures a no smear, no lag performance. All models in the digital LDK 20 Series smoothly integrate into mixed camera configurations, including those with existing analog units. Full operational control is from the user-friendly Series 9000 Universal Camera Control System.

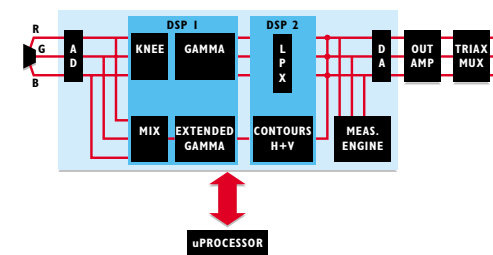


**USER-FRIENDLY LDK20S AND LDK20
FOR CREATIVE PRODUCTIONS**

In the studio or out in the field, the robust LDK 20S and the LDK 20 have the same high levels of user-friendliness thanks to extensive intelligent automatics. So, the camera operator can concentrate on creativity rather than on the advanced technology that lies at his fingertips. Where light levels are low, the camera operator maintains full control thanks to discreet backlighting of the direct access controls and menu type functions on the rear of the camera.

**HiRes DIGITAL PROCESSING THAT PUTS YOU
ON TOP - AND KEEPS YOU THERE**

The LDK 20 Series of cameras features advanced HiRes digital processing that is coupled to 12-bit A/D conversion. And they have built-in provision for future upgrading to tomorrow's full 14-bit A/D video input. The proprietary DSP circuitry has more than 20-bit HiRes digital picture processing.



Two DSPs combine all major functions in the digital domain, including knee, gamma, contour, matrix and color correction. So, camera operators enjoy the highest levels of creative freedom, while producers and directors are assured of supreme standards of picture quality under all conditions.

SET AND MATCH WITH NO COMPROMISE

For both studio and portable cameras in the LDK 20 and 200 Series, outstanding performance is guaranteed by a unique software-programmable video path. It means you can set your own preferred color matrix and select to matrix before or after the gamma correction. In mixed camera configurations (even those which include units from other manufacturers), this assures consistent, no-compromise color matching.

**PORTABLE PERFORMANCE THAT'S
MORE THAN A BIT BETTER**

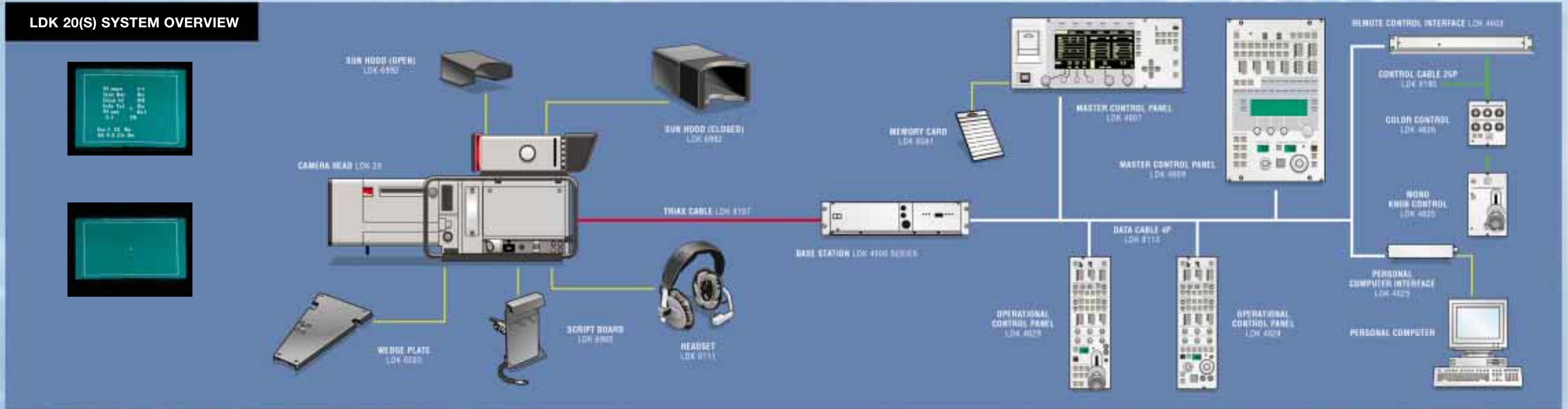
The LDK 200 is a versatile EFP-portable version of the outstanding studio camera and features the same advanced digital processing, 12-bit A/D conversion technology and similar automatics. All of which makes them the perfect match for creative camera operators that make an art from imaging - both in the studio or the EFP/outside broadcast environment.



LDK 20 System overview



LDK 20(S) SYSTEM OVERVIEW



Colors come alive with more than 20-bit HiRes digital processing

The portable camera is compact and easy to operate in EFP operations. The handgrip has an integrated viewfinder and intercom control. An optional zoom control is available for low angle shooting. In the Triax mode (using the TriaxD option), the camera operates up to 3000m. Making it the camera of choice for applications such as major sporting events, which often require extreme lengths of cable run. Like the studio cameras, it has the same switchable DPM sensors for 16:9 and 4:3 shooting.

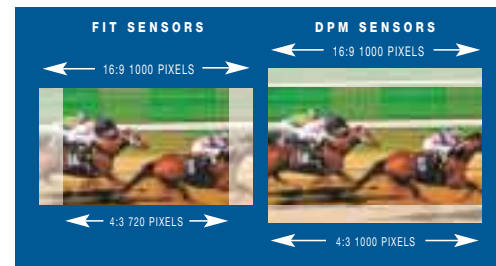


DPM SENSORS. AWARD WINNING TECHNOLOGY FOR 4:3 OR 16:9 OPERATIONS

Both the LDK 20S studio camera and the LDK 200 portable are available with Philips' unique Dynamic Pixel Management (DPM)® sensors. At the touch of a button instantaneous two-way switching is possible between 4:3 and 16:9 - without the need for sensor block exchange. There's no need to change camera set-up or renew the optical centering either, and you get the same angle of horizontal view.

The unique DPM concept ensures there is no difference in horizontal or vertical resolution between formats. With 1000 horizontal pixels per line in both aspect ratios, an outstanding resolution of 70% at 5 MHz (the equivalent of 800 TV lines) is achieved. The exceptionally high dynamic range of FT sensors lets you handle over-exposures up to 600% above normal video levels, with programmable compression functions and superb True Color processing. The absence of smear and the perfect highlight handling make the cameras the favorite choice for shooting where lighting control is limited - as, for instance, at rock-concerts and outdoor sporting events. For the LDK 20 Series of cameras, switching is carried out on the Master Control Panel of the Series 9000 system, or via a remote connector on the Base Station, or an RS 232 line with a shot file management program on your PC. For added security, the LDK 20 camera-head features locally protected switching facilities.

To limit unwanted interference when working, the control levels are user definable on the MCP.



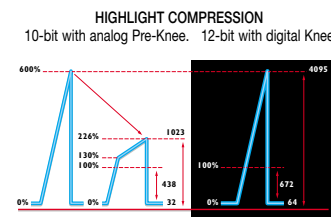
Left : Traditional highlight handling.

Right : Improved highlight handling with digital True Color Knee and digital contour processing.*

Special effects achieved with variable Digital Matrix.* 10-bit with analog Pre-Knee. 12-bit with digital Knee.

UNIQUE CIRCUITRY FOR OUTSTANDING DIGITAL HIGHLIGHT HANDLING

The LDK 20 Series of cameras offers outstanding highlight handling under all conditions, thanks to development of two unique highlight circuits. This advanced dynamic highlight handling performance is only possible with 12-bit A/D conversion on a 600% video level and by applying user definable, digital video compression algorithms.



A programmable pivoting knee simulates film transfer characteristics with the slope of the compression being made according to the video level. As a result, compression is only applied where necessary and in proportion to the highlight, ensuring that the pictures obtained have a film-like quality.

Unique digital True Color Knee circuitry (patent pending) is featured in both new HiRes Digital cameras. The compressed video retains the correct hue even with saturated colors. With the compression being digitally calculated by processing the R, G and B signals simultaneously. When de-saturation is needed, it is carefully balanced, so that colors are faithfully reproduced - even over-exposed skin tones. The results are very natural and can be compared to an artist adding white paint to create the impression of an over-exposed scene.



Special effects achieved with variable Digital Matrix.*



Standard controls are provided for knee point and knee slope, and a variable control is used for de-saturation.

Auto-knee is also available for automatically adjusting knee slope, dependent upon highlights.

EASIER, MORE PRECISE CAMERA MATCHING

In multi-camera configurations, accurate color matching is essential. The LDK 20 Series HiRes Digital cameras assure the highest levels of accuracy and repeatability with a variable 6-point digital color matrix.

The matrix enables users to select colorimetry by presets (1:1, EBU, RAI, BBC, ARD and Skin). Alternatively, presets are user definable. Control is via the MCP (Master Control Panel) on the Series 9000 System.

The unique Philips software-programmable video path enables switching of the matrix either before or after gamma, assuring accurate matching, even in configurations that include cameras from other manufacturers.

EXTENSIVE AUTOMATICS

All LDK 20 Series cameras benefit from extensive automatic functions that help to achieve the highest levels of picture quality under all conditions. These functions include on-line auto black shading and on-line auto black.

DIGITAL GAMMA

With the new LDK 20 Series of cameras, color matching becomes easier and more precise through an exceptionally wide range of standardized gamma curves, which are programmed into the cameras.



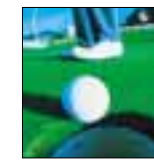
Traditional initial gain in blacks *



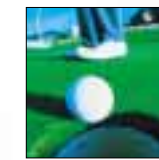
Visible black details via digital contrast features.

Thanks to the accuracy of 12-bit A/D conversion and more than 20-bit digital processing, more black details can be handled as well as the full 600% over-exposure range.

A 6x initial gain of the RGB signals can be achieved with the highest tracking accuracy. This is a valuable asset in productions where gain in dark scenes is needed to provide contrast and film-like reproduction. Digital gamma processing enables soft contrast in black scenes to be enhanced, together with hard contrast with saturated color in bright scenes.



Sharp contours in green grass.



360° Skin Tone Contour feature used to soften green grass.*

DIGITAL CONTRAST

The LDK 20 Series has more than 20-bit HiRes digital processing to help improve picture contrast. A black-stretch function is available, which enables more detail in black areas.

This is supported by black press, which improves the contrast impression by simulating the S-shaped curve of film. Thus assuring digital accuracy at all levels.

DIGITAL CONTOUR

The superior picture quality obtainable with the new Philips HiRes Digital cameras is assisted by digital contour processing at a 36Mhz output rate. Extended dynamic range contour is possible with the more than 20 bits HiRes digital processing using RGB signals 600% above nominal video, without any need for analog highlight compression.

LDK 20S and LDK 200S with switchable DPM sensors for 4:3 or 16:9 operations

LDK 20 and LDK 200 for all digital imaging in standard 4:3 productions

Powerful 12-bit A/D video conversion

User-definable digital color matrix and wide range of presets

Superior all digital highlight handling up to 600% above normal video

Extensive automatics for stand alone applications and ease of use

Easy definable highlight handling with pivoting knee and True Color Knee

Software programmable video path and variable color matrix for perfect color matching

Digital gamma with multiple standard presets with more than 20-bit HiRes digital processing

Digital contour - an extensive range of parameters with 36Mhz digital video output

Digital contrast - black stretch and black press for enhanced details in the black

Long Triax mode operation of 3000m via optional TriaxD

SuperXPander: Large Lens Adaptor with 7" viewfinder and all studio functions PIP facility for the 7" viewfinder for return video

User-friendly operation with Series 9000 Universal Camera Control System