product data sheet

LDK 500

14-Bit Digital Camera

Grass Valley™ products from Thomson offer the most comprehensive multi-format solutions for acquisition, production, storage and playback—and a strong foundation for centralized, proactive status and activity monitoring.

These solutions include one of the broadest selections of standard- and high-definition (SD and HD) digital video cameras.

With one of the best known imaging design teams in the world and six technical and engineering Emmy® awards for camera-related technologies, Grass Valley camera products continue to break ground for innovation and creative ideas.

Grass Valley continues to bring superior digital acquisition to a broad range of broadcast applications with the LDK 500 camera, which provides a new creative tool for SD television production.

LDK 500 Sensors

The LDK 500 is available as either a switchable 16:9/4:3 system or as only a 4:3 camera. In either case, its ultra-low smear IT sensors feature a high sensitivity of F14 at 2000 lux, enabling exceptional results in low light and high-contrast situations.

The LDK 500 has two motorized filter wheels, the first containing neutral density filters and the second with optical effects filters, including star filters and soft focus. The LDK 500 camera also includes digital filters, delivering a completely new level of creativity within the camera head.

14-Bit Conversion

The LDK 500 is the first to use 14-bit analog-to-digital conversion, providing four times as many levels from each sensor as a 12-bit camera. This conversion technology ensures that you can capture even the most subtle graduations in tone and pass them on to the camera's next-generation digital-processing system, the V-Engine.

The use of 14 bits also provides for better headroom handling in the digital domain, along with lower digital noise to better match the new low-noise CCDs of the LDK 500.

V-Engine Digital Signal Processing

The next-generation V-Engine provides you with new level of in-camera creativity, offering more precise control over effects as well as greater processing power.

As with other LDK series cameras, you make all LDK 500 adjustments in the digital signal domain, giving you complete repeatability. These parameters include highlight handling, contrast and gamma control (with preset and variable gamma settings), variable matrix for colorimetry adjustments, flare, white/black shading, leaking pixel concealment, gain, and contour.

key features

- Compact design based on popular LDK 300 camera head
- 14-bit A-D conversion
- High sensitivity: F14/2000 lux
- Excellent signal-to-noise ratio: 65 dB typical
- Switchable 16:9/4:3 for flexibility
- Two remote-controlled filter wheels
  - —Neutral density
  - —Optical effects
- Electronic color-correction filters
  - —Variable master color temperature
- New levels of creativity
  - —Digital monotone, soft focus, gradient filters
  - —Secondary 16-vector color corrector
  - —Built in freeze frame
- Dual skin-tone circuits
- Unique operational features:
  - —Optional handgrip zoom control
  - —Wide angle viewfinder lens
  - —Adjustable orthopedic shoulderpad
- Use with SuperXpander enables configuration with studio lenses and accessories
- Compatible with a variety of Grass Valley transmission systems
  - —Analog Triax system
  - —Digital Triax system
  - —Digital Wireless Triax system
  - —DigiLink system
- Full studio functionality using LDK 5430 triax adapter
  - —Teleprompter with power
  - —Reverse teleprompter
  - —Dual return video
  - —Tracker communications

Yet the V-Engine is very different from traditional digital cameras that base their processing workflows on previous analog camera systems. Instead of a largely linear flow of data through various processing steps, the V-Engine acts as a routing switcher and memory controller and features two application-specific integrated circuits (ASICs) that function as co-processors. This approach creates a programmable video-processing architecture that can accommodate not only current features such as digital filters (see below) but one into which you can download new algorithms and features, helping to maximize your investment.

Added Creativity

One new added feature of the V-Engine is a freeze-frame capability that can streamline workflows and reduce costs. For example, you can capture a frame, allowing your talent and lighting director to leave while you make engineering adjustments, setting up parameters such as skin tone detail or effects without incurring additional costs.

The built-in frame store of the LDK 500 also allows the use of V-shift while the camera is genlocked, so that you can eliminate bars on unsynchronized monitors or projectors. It is also possible to delay the camera's output by one frame to aid in synchronizing it with wireless cameras.

The unique architecture of the LDK 500 also accommodates additional software features, including a multi-matrix color corrector and digital video effects filters.

New Levels of Creativity with Digital Filters

The digital filters of the LDK 500 are part of the V-Engine and are fully adjustable to provide a very wide range of effects with several presets. You can see examples of these effects below.

Monotone Filters – Sepia, Gelatine, and Cyan

Soft Focus Filter – Adjustable center spot size, aspect ratio, position, and depth of soft focus area. Also includes vignette effects.

Gradient Filters – Adjustable and customizable horizontal and vertical transitions, with variable gradients. Presets include blue sky and sunset effects.

Multi-Matrix Color Corrector – Further enhancing your creativity is a multi-matrix secondary 16-vector color corrector. Using it, you can select a color segment and replace it with another; in both cases you can adjust the hue and luminance levels as well as the transition of the adjusted area.

All color correction is electronic, with presets for 3200°K, 4700°K, 5600°K, and 7200°K. The LDK 500 also includes a variable master color temperature control with a range of 2200°K to 7500°K in 100°K steps, two autowhite presets, and a setting for fluorescent light and continuous autowhite.

LDK 500 – Compact, Lightweight, Ergonomic

In common with other Grass Valley LDK series cameras, the LDK 500 offers a compact and lightweight docking design, based on a camera body renowned for its robustness and ergonomic design. This makes the camera suitable for a very wide range of applications from simple hand-held configurations to full studio uses.

Docking adapters make the LDK 500 part of a future-proof system. Currently, adapters are available for analog or digital triax, digital multi-core, or wireless operation. With these adapters, you can easily change the camera from handheld to studio operation.

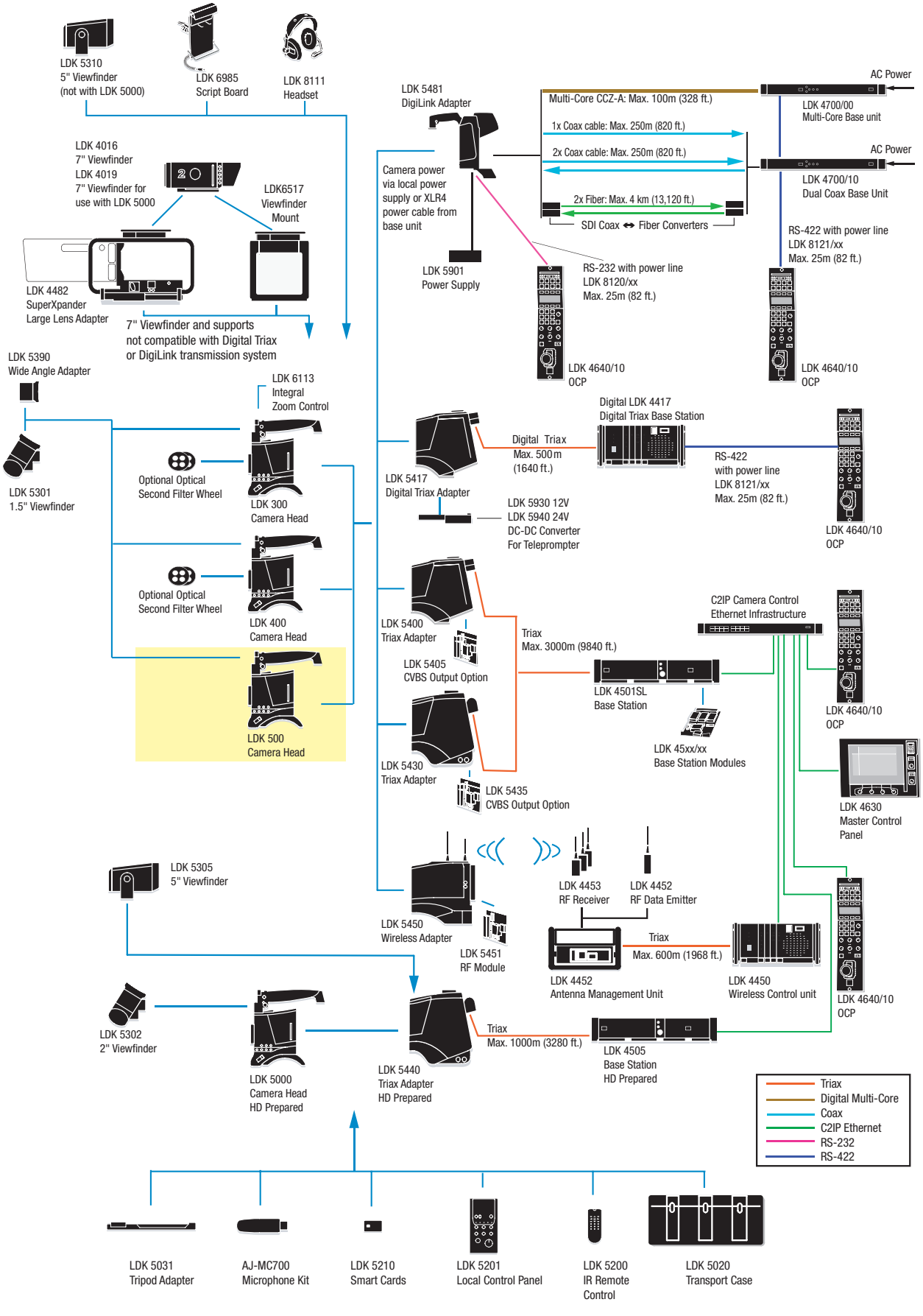
You can mount the camera in a SuperXpander large-lens adapter with a high-resolution 7" viewfinder, or use 5" or 1.5" viewfinders. You can also configure a full studio system to include Teleprompter video and power, private data channel, return video channels, and, of course, a full intercom system.

In handheld operation, the LDK 500 camera is ergonomically well balanced and options such as a built-in handgrip zoom control, wide-angle viewfinder adapter, and rotary triax connector make it easy for you to reach difficult low level shots.

The LDK 500 system is also fully compatible with studio production facilities and utilizes the same operational control panels as other Grass Valley LDK series cameras using the C2IP camera control system.

The Grass Valley C2IP system allows simple connection of all elements of camera control using standard Ethernet components. You can connect up to 99 cameras in a single system, enabling the sharing of control-room facilities and centralized operations. All cameras operate from the same type of operational control panel (OCP) or master control panel (MCP) and you can easily transfer the settings between cameras.

The LDK 500 makes full use of the capabilities of the C2IP network, as all its new features are remotely controllable. You can fully access and control its viewfinder menu from the OCP or master control unit.


LDK 5310
5" Viewfinder
(not with LDK 5000)
LDK 6985
Script Board
LDK 8111
Headset
LDK 4016
7" Viewfinder
LDK 4019
7" Viewfinder for
use with LDK 5000
LDK6517
Viewfinder
Mount
LDK 4482
SuperXpander
Large Lens Adapter
7" Viewfinder and supports
not compatible with Digital Triax
or DigiLink transmission system
LDK 5390
Wide Angle Adapter
LDK 6113
Integral
Zoom Control
LDK 5301
1.5" Viewfinder
Optional Optical
Second Filter Wheel
LDK 300
Camera Head
Optional Optical
Second Filter Wheel
LDK 400
Camera Head
LDK 500
Camera Head
LDK 5481
DigiLink Adapter
Multi-Core CCZ-A: Max. 100m (328 ft.)
1x Coax cable: Max. 250m (820 ft.)
2x Coax cable: Max. 250m (820 ft.)
2x Fiber: Max. 4 km (13,120 ft.)
SDI Coax ↔ Fiber Converters
AC Power
LDK 4700/00
Multi-Core Base unit
AC Power
LDK 4700/10
Dual Coax Base Unit
Camera power
via local power
supply or XLR4
power cable from
base unit
LDK 5901
Power Supply
RS-232 with power line
LDK 8120/xx
Max. 25m (82 ft.)
RS-422 with power line
LDK 8121/xx
Max. 25m (82 ft.)
LDK 4640/10
OCP
LDK 4640/10
OCP
LDK 5417
Digital Triax Adapter
Digital Triax
Max. 500m
(1640 ft.)
Digital LDK 4417
Digital Triax Base Station
RS-422
with power line
LDK 8121/xx
Max. 25m (82 ft.)
LDK 4640/10
OCP
LDK 5930 12V
LDK 5940 24V
DC-DC Converter
For Teleprompter
LDK 5400
Triax Adapter
LDK 5405
CVBS Output Option
Triax
Max. 3000m (9840 ft.)
C2IP Camera Control
Ethernet Infrastructure
LDK 4501SL
Base Station
LDK 45xx/xx
Base Station Modules
LDK 4640/10
OCP
LDK 5430
Triax Adapter
LDK 5435
CVBS Output Option
LDK 4630
Master Control
Panel
LDK 5305
5" Viewfinder
LDK 5450
Wireless Adapter
LDK 5451
RF Module
LDK 4453
RF Receiver
LDK 4452
RF Data Emitter
Triax
Max. 600m (1968 ft.)
LDK 4452
Antenna Management Unit
LDK 4450
Wireless Control unit
LDK 4640/10
OCP
LDK 5302
2" Viewfinder
LDK 5000
Camera Head
HD Prepared
LDK 5440
Triax Adapter
HD Prepared
Triax
Max. 1000m (3280 ft.)
LDK 4505
Base Station
HD Prepared
Triax
Digital Multi-Core
Coax
C2IP Ethernet
RS-232
RS-422
LDK 5031
Tripod Adapter
AJ-MC700
Microphone Kit
LDK 5210
Smart Cards
LDK 5201
Local Control Panel
LDK 5200
IR Remote
Control
LDK 5020
Transport Case

Transmission Options

Adapter Model	LDK 5481 DigiLink	LDK 5417 Digital Triax	LDK 5400 Triax	LDK 5430 Enhanced Triax	LDK 5450 Wireless Triax
Maximum Cable Length [*1]	Dual fiber 4 km (13,120 ft.)	13 mm triax 500m (1,640 ft.)	14 mm triax 3 km (9,840 ft.)	14 mm triax 3 km (9,840 ft.)	11 mm triax 600m (1,968 ft.) base unit to antennae
	Dual coax 250m (820 ft.)	8 mm triax 250m (820 ft.)	11 mm triax 2 km (6,560 ft.)	11 mm triax 2 km (6,560 ft.)	
	Multi-core 75m (246 ft.)		8 mm triax 1.5 km (4,920 ft.)	8 mm triax 1.5 km (4,920 ft.)	150m (492 ft.) wireless range
I/O at Camera Head					
Front microphone in	✓	✓	✓	✓	✓
Viewfinder	✓	✓	✓	✓	
Lens	✓	✓	✓	✓	✓
RS-232 control	✓	✓	✓	✓	✓
I/O at Camera Adapter					
Rear microphone in		✓	✓	✓ x2	✓
Intercom headset	✓	✓	✓	✓	✓
CVBS out	✓		✓[*6]	✓[*6]	
SDI out	✓				✓
Teleprompt out	✓	✓		✓	
Viewfinder (monitoring) out	✓	✓	✓	✓	✓
External video out	✓	✓	✓	✓	
Ref in (Genlock)	✓		✓[*6]	✓[*6]	
DC power in	✓		✓	✓	✓
Utility DC power out	✓	✓	✓	✓	✓
Script light power out	✓	✓	✓	✓	
Tally out	✓			✓	
Tracker connector				✓	
Private data	✓		✓	✓	
Triax connector		✓	✓	✓	
Fiber connector	optional				
Multi-core 26P EBU N21	✓				
Coax operation	✓				
I/O at Base Station	**LDK 4700**	**LDK 4417**	**LDK 4501**	**LDK 4501**	**LDK 4450**
Power requirement	AC Mains	AC Mains	AC Mains	AC Mains	AC Mains
Audio 1 out	✓	✓	✓	✓	✓
Audio 2 out				✓	✓
Intercom	✓	✓	✓	✓	✓
Control bus RS-422	✓	✓			
Control bus C2IP			✓	✓	✓
Control bus Series 9000			✓	✓	
SDI out	✓ x2	✓ x3	✓ x6	✓ x6	✓ x3
YUV out	✓[*4]		✓	✓[*5]	
RGB out	✓[*4]			[*5]	
CVBS out	✓ x2	✓ x2	✓	✓	
Teleprompter in	✓+loop-thru	✓+loop-thru[*3]	✓+loop-thru	✓+loop-thru	
External video 1 in	✓+loop-thru	✓+loop-thru	✓+loop-thru	✓+loop-thru	
External video 2 in		✓+loop-thru[*3]		✓+loop-thru	
Ref in	✓+loop-thru	✓+loop-thru	✓+loop-thru	✓+loop-thru	✓+loop-thru
Monitoring out			✓	✓	
Private data	✓		✓	✓	

[*1] Maximum triax cable lengths specified using Nokia cable. Coax cable lengths using Belden 1694A or equivalent. Multi-core CCZ-A.
[*2] Refence In via multi-core
[*3] Either External 2 or teleprompter is available
[*4] Either YUV or RGB available
[*5] Either YUV, RGB, or 3x CVBS available
[*6] With optional encoder board

Specifications

Camera	LDK 500	
Power requirements	Triax or DC 12V	
Power consumption	12W excluding viewfinder & triax adapter	
Operating temperature	-20°C to +45°C (-4°F to 113°F)	
Storage temperature	-20°C to +60°C (-4°F to 140°F)	
Weight	2.1 kg (4.6 lbs.) not incl. viewfinder & triax adapter 5.0 kg (11 lbs.) incl. 1.5" viewfinder & triax adapter	
Dimensions	214 mm (H) x 125 mm (W) x 241 mm (L) with Compact adapter 205 mm (H) x 125 mm (W) x 357 mm (L) with Triax adapter	
Optical system	F1.4 prism	
Optical filter wheels	2x motorized filter wheels	
Optical filters on first wheel	Clear, 1/4 ND, 1/16 ND, 1/64 ND	
Optical filters on second wheel	Clear, 4-point star, 6-point star, soft focus	
Color-correction filters	Electronic 3200°K, 5600°K, 7500°K, FL, 2 AWB presets, continuous autowhite, Variable master color temperature: 2200°K to7500°K in 100°K steps	
Digital-effects filters	Monotone: Sepia, Cyan, Gelatine Gradient: H/V variable transition variable with presets: blue sky, sunset Soft-focus filter variables: position, size, aspect ratio, softness, luminance 2nd color corrector: 16 color segments, adjustable range, hue, saturation, luminance Frame store	
Pickup device number & size	3 x 2/3" CCDs	
Pickup device	**ITW**	**IT**
Picture elements (H x V)		
PAL 16:9	1008 x 591	N/A
PAL 4:3	756 x 591	756 x 591
NTSC 16:9	1020 x 505	N/A
NTSC 4:3	765 x 505	765 x 505
Resolution in 16:9 4:3	800 TV lines 800 TV lines	N/A 750 TV lines
Smear Sensitivity 2000 lux	-140 dB (typical) F14	
S/N ratio (typical) PAL NTSC	 63 dB in studio mode 65 dB in studio mode	
Vertical resolution	480 lines (PAL), 400 lines (NTSC)	
Modulation depth	70% @ 5 MHz (typical)	
Digital quantization	14 bits A to D	
Digital signal processing	>22 bits, 18 MHz & 36 MHz	
Gain	-6 dB to +42 dB in 3 dB steps (user-defined presets)	
Variable master gain	-6 dB to +17.9 dB stepless	
Exposure control	Down to 1/2000 sec	
Clean scanning PAL NTSC	 51 to 103 Hz 61 to 151 Hz	
Memory card	Smart card, store & recall scene & operator files	
Inputs/outputs at camera		
Front microphone input	XLR-3 female, balanced +48V selectable	
Lens connector	12-pin	
Control input	9-pin RS-232C compatible	
Viewfinder connector	20-pin	
Supplied accessories	Operator's manual, camera rain cover, 1 x owner card, 2 x user cards, shoulder strap	
Optional viewfinder 1.5" viewfinder	 **Model No. LDK 5301**	
Resolution	CRT >600 TV lines (center)	

Ordering Information

Please contact your authorized Grass Valley representative.

Support Services & Training

The Grass Valley Support Services & Training team delivers complete service solutions that enhance your return on Grass Valley products and global systems solutions. Advanced training and proactive support, by reducing down time, keeps your equipment and staff performing at optimum productivity and quality.

Our pre-packaged suite of SupportPRO Services provides support though the whole process:

- StartPRO Commissioning Support
- Factory, On-Site and Web Training Classes
- TechPRO On-Site and Comprehensive Software and Hardware Support
- ServicePRO Comprehensive Software and Hardware Support
- PartsPRO Advanced Exchange Hardware Support
- Critical Spares Kits for Most Products

For specific requests, our worldwide experienced Support Services & Training experts can build and assist you with customized solutions.

For more information contact your authorized Grass Valley representative or visit us online at www.thomsongrassvalley.com/support.

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