



PHANTOM[®]

KT-SERIES

DATASHEET



PHANTOM

KT1640

KT1240

KT840

COMPACT HIGH-SPEED CAMERAS

Forza Silicon BSI Sensor

2560 x 1664

up to 3,750 fps (KT1640)

up to 2,900 fps (KT1240)

up to 1,850fps (KT840)

FEATURES & BENEFITS

PRECISION HIGH-SPEED & HIGH RESOLUTION

- **2560 x 1664 BSI** (back side illuminated) **sensor** ensures superior image performance due to increased pixel response.
- Programmable I/O for advanced signal control, synchronization & precision triggering.
- Sustained image throughput up to 16GP/s for maximum pixel resolution at any setting.
- Reduce motion blur with exposure times down to 450 ns with FAST* option, independent of frame rate.

SMALL SIZE, BIG IMPACT

- Increased throughput capacity in a compact camera benefits stereo imaging applications by reducing overall system size & complexity.
- Lightweight body with mounting sockets on 4 sides with removable handle makes installation simple.

WORKFLOW FLEXIBILITY

- 10Gb Ethernet for 7x faster data download directly from camera's RAM buffer – up to 128 GB.
- CF Express cards, SDI/HDMI video out & on-camera controls enable a secure & efficient untethered workflow.

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IMAGE & SENSITIVITY

Sensor Type	Forza Silicon CMOS BSI (back side illuminated) with Global Shutter	
Maximum Resolution	2560 x 1664	1280 x 832 Binned
CAR Increments	512 x 32	256 x 64 Binned
Pixel Size	9.27 µm	18.54 µm Binned
Sensor Size	23.7 x 15.4 mm	
Bit Depth	12-bit	
	EMVA 1288 Measurements @ 532 nm	
	Standard Mode	Binned Mode
Quantum Efficiency %	88.7% mono 73.5% color	84.2% mono
Max. SNR (dB)	39.8	44.6
Absolute Sensitivity Threshold (p)	24.5 mono 22.4 color	40.4 mono 54.1 color
Saturation Capacity (e-)	9,588 mono 9,050 color	14,512 mono 14,335 color
Temporal Dark Noise (e-)	24.0	59.2
Dynamic Range (dB)	51.9	54.9

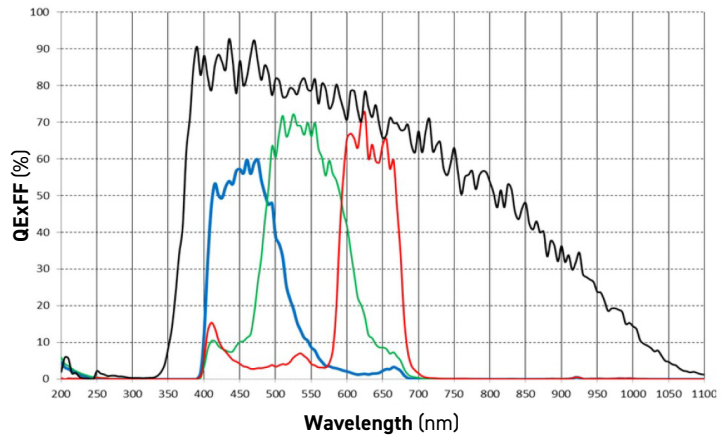
Measurements recorded at 532 nm with monochrome & color cameras using the EMVA 1288 3.1 standard. Visit www.phantomhighspeed.com/emva for more about EMVA 1288.



Phantom KT-Series Rear Panel

SPECTRAL RESPONSE

Quantum Efficiency: Monochrome & Color



CONNECTIVITY & SIGNALS

Ethernet	Gigabit & 10Gb Ethernet
Timecode	IRIG-B modulated & unmodulated
Port Descriptions	Rear Ports +20-28V DC: Fischer 6-pin for main power 1 TRIGGER: BNC – Trigger-In, TTL, switch closure 2 TC IN: BNC – Timecode-In for IRIG-B, switchable to programmable signal SDI: BNC – 3G-SDI video out ETHERNET: Fischer 8-pin for control/data transfer 4 FSYNC/P: BNC – Programmable I/O RD/IO: Fischer 8-pin for Range Data & 2 Programmable I/O via RDIO cable (accessory) CFexpress Port Front Ports SDI: DIN (mini-BNC) 3G-SDI video out HDMI: HDMI Type A video out VF PWR: HIROSE 4-pin for monitor/viewfinder
Programmable I/O Signals	Programmable I/O port on body for Strobe, FSync, Ready, Timecode-Out, Multi-Strobe, Auto Trigger (+mode 2), SW Trigger, Recording, Event In, Memory Gate In, Pre-trigger In, Auxtrigger In, Range Data Corrp, assign & define signals in PCC RDIO cable (accessory) for 2 additional I/O ports
Hardware Trigger	TTL or high-voltage (falling/rising edge) & dedicated BNC
Software Trigger	Trigger Button via Ethernet, Image-Based Auto Trigger (IBAT), SDK or Telnet
Synchronization	External Sync 5V TTL via FSync or IRIG Timecode
Recording Features	External frame rate control, Burst Mode, Continuous Recording, multi-partitions & frame straddling
Video Output	3G-SDI via BNC, DIN & HDMI Type A port
Accessory Power	HIROSE 4-pin for 12V monitors up to 1 Amp



MEMORY & STORAGE			
	KT1640	KT1240	KT840
RAM Buffer	32GB, 64GB & 128GB		16GB, 32GB & 64GB
Capture Duration†	32GB 1.7 s	32GB 2 s	16GB 1.7 s
	64GB 3.3 s	64GB 4 s	32GB 3.3 s
	128GB 6.7 s	128GB 8 s	64GB 6.7 s
Multi-Cine	Up to 63 partitions		
Frame Timer Clock	80MHz		
Nonvolatile Media	CFexpress Type B cards approved at camera launch: Exascend 1TB Essential Series & Essential Pro; Wise Advanced 1TB		
Media Transfer Rates	275MB/s Full 32GB RAM save time = 2 minutes		

FRAME RATES & EXPOSURE			
	KT1640	KT1240	KT840
Top FPS @ Max Resolution	3,750 fps	2,900 fps	1,850 fps
Maximum FPS	421,000 fps KT1640-E225: 225,000 fps	326,270 fps KT1240-E225: 225,000 fps	222,220 fps
Minimum FPS	100 fps		
Frame Timer Clock	80MHz		
Minimum Exposure	1.06 μ s standard; 450 ns with FAST* option <i>Pulsed lighting techniques can reduce effective exposure to 200 ns or less.</i>		
PIV Features	Shutter Off Mode with straddle time of 250 ns <i>Effective frame pair frequency of 4MHz for frame straddling PIV.</i>		
Exposure Features	Burst Mode, EDR (Extreme Dynamic Range), autoexposure & overexposure indication over video & in PCC		

FRAME RATE CHART

Examples of common resolutions & maximum frame rates.

Binned mode has monochrome output only.

MAXIMUM FRAME RATES						
Resolution (H x V)	KT1640		KT1240		KT840	
	Standard	Binned	Standard	Binned	Standard	Binned
2560 x 1664	3,750 fps		2,900 fps		1,850 fps	
2560 x 1600	3,910 fps		3,030 fps		1,930 fps	
2560 x 1440	4,352 fps		3,370 fps		2,140 fps	
2560 x 256	24,390 fps		18,900 fps		12,040 fps	
2560 x 64	95,000 fps		73,620 fps		47,610 fps	
2048 x 1152	6,600 fps		5,110 fps		3,300 fps	
1536 x 1536	6,600 fps		5,450 fps		3,300 fps	
1024 x 1024	14,800 fps		11,470 fps		7,420 fps	
1280 x 832		15,037 fps		11,650 fps		7,420 fps
1280 x 768		16,260 fps		12,600 fps		8,030 fps
1024 x 832		18,223 fps		14,120 fps		9,130 fps
1024 x 640	23,660 fps		18,330 fps		11,860 fps	
768 x 768		26,315 fps		20,390 fps		13,170 fps
1024 x 512	29,500 fps		22,860 fps		14,810 fps	
768 x 640		31,496 fps		24,400 fps		15,810 fps
1024 x 256	58,800 fps		45,570 fps		29,520 fps	
512 x 512		58,000 fps		44,950 fps		29,520 fps
1024 x 128	115,900 fps		89,820 fps		58,820 fps	
512 x 128		222,200 fps		172,200 fps		115,940 fps
1024 x 32	421,000 fps[‡]		326,270 fps[‡]		222,220 fps	
512 x 64		421,000 fps*		326,270 fps[‡]		222,220 fps

* Export controlled FAST option. † Record times with top FPS @ max resolution. ‡ KT1640-E225 and KT1240-E225 maximum frame rate is 225,000 fps.



CONTROL

Software & OS	Phantom Camera Control (PCC) – Windows 64; SDK for C/C++, C#, Python, MatLab & LabView
On-Camera Controls	Standard Feature. Access menu system with encoder, viewed on video monitor. Buttons for trigger, play & save. Color indicates current camera state.
Primary File Format	Phantom Cine RAW (.cine)
Alternative File Formats	Easily convert to formats including MP4, Apple ProRes, MOV, AVI, TIFF, JPG, DNG & more using PCC. Cine files compatible with video editing & motion analysis programs.
Software Features	Continuous recording for automated workflows, Integrated Data Acquisition (NI-DAQ), support for DIC Calibration with Sync-Snapshot menu, advanced image tools including crop & resample, tone curves, filters & more.

POWER

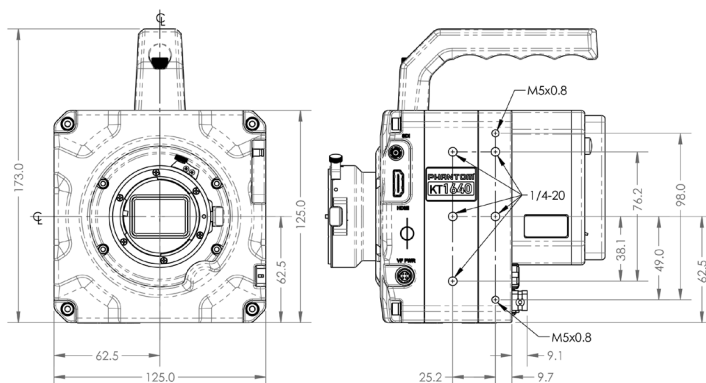
AC Power	100V to 240V AC, 160W power supply included
Voltage Range	20V to 28V DC
Power Consumption	90W typical
Battery Options	Works with 24V battery sources only, input through primary power port.

ENVIRONMENTAL

Operating Temperature	14° to 122° F (-10° to 50° C)
Storage Temperature	-4° to 158° F (-20° to 70° C)
Relative Humidity	≤ 85% noncondensing
Operational Shock	30G, 11 msec sawtooth, 3 axes, 2 directions per axis, 10 shocks per direction (60 pulses total)
Operational Vibration	7.5 gRMS, 50Hz to 2KHz, 3 axes, 15 min/axis, IAW MIL-STD-202H Method 214-I, Test Condition B
Regulatory	Emissions – CE & UKCA Compliant EN 61326-1, Class A Immunity – CE & UKCA Compliant EN 61326-1, Class A FCC – CFR 47, Part 15, Subpart B & ICES-003, Class A Safety – IEC 60950-1 (2012)

MECHANICAL

Housing	KT model
Dimensions	4.9 x 4.9 x 6.4 inches (12.5 x 12.5 x 16.3 cm) Handle adds 1.9 inches (4.8 cm)
Weight	7 lb (3.2 kg)
Lens Mounts	Nikon F mount (aperture support for G style lenses) Canon EF mount (with electronic focus & iris control) PL mount C mount M42 mount
Mounting Points	1/4-20: 16 total – 2 bottom, 10 side & 4 on top 3/8-16: 1 total – 1 on side M5x0.8: 14 total – 4 bottom, 6 side & 4 on top
Internal Shutter	Standard, for remote black references
Cooling	Active cooling; Quiet Mode disables fans during video capture



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Specifications subject to change.

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