

### Designed for what's next

The ProGrade Digital Gold and Cobalt CFexpress memory card families are based on proven, Solid State Drive (SSD), Quad-lane PCIe controller technology that offers both best-in-class value and performance options for imaging devices of the future. Non-Volatile Memory Express (NVMe) host controller interface in the CFexpress standard ensures that host and card performance are optimized for our leading edge CFexpress product lines. All ProGrade Digital CFexpress cards are compliant with the CompactFlash Association, CFexpress 2.0 specification—including PCIe and NVMe interoperability compliance.

For emerging mainstream imaging applications, our Gold label cards sustain burst write speeds of between 600MB/sec and 1,000MB/second – ideal for DSLR and Mirrorless, full frame burst, shooting. At 256GB and greater capacities in our Gold label cards, the average write speed across the entire volume ensures uninterrupted recording for a broad range of compressed video modes. Our Cobalt label cards can sustain minimum write speeds of 1,300MB/second and allow capture of RAW 4K video across the entire volume up-to 650GBs of capacity. Both card families provide sustained read speeds of 1,600MB/sec. ensuring that offload time is minimized, and workflow efficiency is greatly improved over applications that traditionally use SD UHS-II or CFast memory formats.

With specific focus on 4K video capture, one hour of raw 4K video requires a card write speed between 380 and 1,000MB/sec dependent on color depth and frame rate. As shown in the table below, ProGrade Digital offers cards that are capable of capturing even cinema-grade raw video at up-to 12 bits of color depth, and up-to 60fps.

### Capture Performance

	Broadcast			Episodic			Cinema		
	ProRes422*		Color Depth	ProRes4444*		Color Depth	Raw**		Color Depth
	Color Depth	Frames/sec	Write MB/sec	Color Depth	Frames/sec	Write MB/sec	Color Depth	Frames/sec	Write MB/sec
UHD	10	60	147	10	120	331			
4K	10	30	78	10	30	176	12	24	382
4K	10	60	157	10	60	353	12	30	478
4K	10	120	314	10	120	707	12	60	956

\*From Apple ProRes white paper for compressed files

Gold

Cobalt

\*\*No oversampling included

From a workflow perspective, read speed in cards is essential in terms of minimizing delay for content ingest into the editing environment. ProGrade Digital Gold and Cobalt cards provide nearly 3x the performance level of CFast cards – dramatically improving workflow efficiency. By example, the table below shows a 1 hour, 4K video file of 636GB transferred in just 11.8 minutes from a ProGrade CFexpress card to a workstation using a ProGrade Digital USB 3.1, Gen 2 reader at a real-world transfer speed up to 900MB/sec.

### Workflow Performance

	Resolution	Color Depth	fps	Encoding	File size GBs	MB/sec	Minutes
Broadcast	UHD	10	60	ProRes422	530	900	9.8
Episodic	4K	10	30	ProRes4444	636	900	11.8
Cinema***	4K	12	30	Raw	1,720	900	31.9

\*\*\*File size shown requires download from three 650GB cards with three readers



### ProGrade Digital CFexpress Type B Delivers:

	Gold			Cobalt
Densities and Performances	120GB	256GB	512GB - 1TB	325GB, 650GB
Max Read:	1600MB/s	Max Read: 1600MB/s	Max Read: 1600MB/s	Max Read: 1600MB/s
Max Write:	600MB/s	Max Write: 1000MB/s	Max Write: 1000MB/s	Max Write: 1400MB/s
Ave. Write:	145MB/s	Ave. Write: 350MB/s	Ave. Write: 500MB/s	Ave. Write: 1300MB/s
Interface	NVMe 1.3 with PCIe Gen3 X4 interconnect (1.0 specification requires 2 lanes only)			
Operating Voltage	+3.3V; Min = +3.0V, Max = +3.6V			
Operating Current	Normal: 1550mA, Max: 2500mA			
ECC Engine	LDPC			
Power Management	Supports Power States (PS0, PS1, PS2, PS3, and PS4) with PS4 power consumption under 2mW			
Storing Temperature	-20C to 85C			
Operating Temperature	-10°C to 70°C			
Operating & Storage Humidity	95% or less (non-condensing)			
Shock	50G, 11ms duration			
Vibration	10Hz - 200Hz / 1.52mm displacement 10Hz - 2000Hz, 15G acceleration			
Altitude	2.26psi/Altitude:24384m			
SMART & Sanitize	Yes			
X-ray Proof	Yes			
Dimensions	Type B: 29.6mm x 38.5mm x 3.8mm			
Warranty	3-year			

- Fully compliant with CompactFlash™ Association 2.0 specification
- XQD host interoperable with firmware support
- Metal enclosure/encasement to endure high temperatures while providing better thermal conductivity
- Built-in thermal throttling to protect your card and its content in the event of overheating
- Designed to provide peak performance for flagship cinema, video and photography cameras
- Optimized controllers specifically designed for use in professional-grade cameras
- Rigorous full card testing with serialized tracking of key components and manufacturing data for the highest quality control
- Component-level testing down to individual memory chips for optimal quality
- Refresh Pro™ enabled to quickly refresh card performance and monitor card health

