

### 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 support burst write speeds up to 1500MB/second – ideal for DSLR and Mirrorless, full frame burst, shooting. In our Gold label cards, the minimum sustained 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 1,400MB/second and allow capture of RAW 6K & 8K video across the entire volume up-to 650GBs of capacity. Both card families provide sequential read speeds of up to 1,700MB/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 4K video at up-to 12 bits of color depth, and up-to 60fps. 8K Raw video at up-to 30fps is also possible on our Cobalt class cards.

### Capture Performance

	Broadcast ProRes422HQ*			Episodic ProRes4444*			Cinema Raw**		
	Color Depth	Frames/sec	Write MB/sec	Color Depth	Frames/sec	Write MB/sec	Color Depth	Frames/sec	Write MB/sec
4K	10	30	78	10	30	176	10	24	265
4K	10	60	236	10	60	353	10	60	664
6K	10	24	212	10	24	318	10	24	597
6K	10	60	530	10	60	795	10	30	746
8K	10	24	377	10	24	565	10	24	1062
8K	10	60	942	10	60	1414	10	30	1327

\*From Apple ProRes white papers

\*\*No oversampling included

Gold

Cobalt

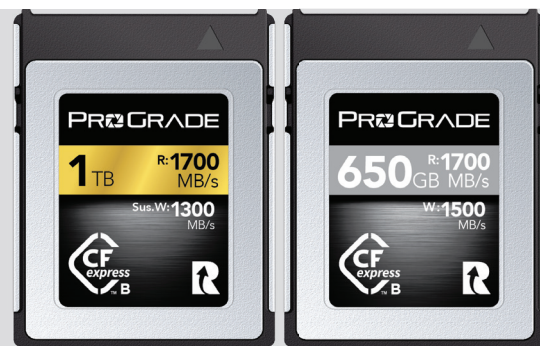
From a workflow perspective, read speed in cards is essential in terms of minimizing delay for content ingest into the editing environment. ProGrade Digital Gold and Cobalt cards provide nearly 3x the performance level of CFast cards – dramatically improving workflow efficiency. By example, the table 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 3.2, Gen 2 reader at a real-world transfer speed up to 900MB/sec. Using the ProGrade Digital Thunderbolt 3 CFexpress reader that same transfer would take just 6.2 minutes.

### Workflow Performance

	Resolution	Color Depth	fps	Encoding	File size GBs**	MB/sec*	Minutes
Broadcast	4K	10	60	ProRes422HQ	566	1700	5.5
Episodic	4K	10	30	ProRes4444	848	1700	8.3
Cinema	4K	10	30	Raw	1,273	1700	12.5

\*Using a Thunderbolt 3 reader

\*\*From Apple ProRes white paper



### ProGrade Digital CFexpress Type B Delivers:

Densities and Performances					
	128GB	256GB	512GB	1TB	165GB - 650GB
Max Read: 1700MB/s Max Write: 1400MB/s Min Write*: 140MB/s *Min Sustained Write	Max Read: 1700MB/s Max Write: 1400MB/s Min Write*: 300MB/s	Max Read: 1700MB/s Max Write: 1400MB/s Min Write*: 850MB/s	Max Read: 1700MB/s Max Write: 1500MB/s Min Write*: 1300MB/s	Max Read: 1700MB/s Max Write: 1500MB/s Min Write*: 1400MB/s	Max Read: 1700MB/s Max Write: 1500MB/s Min Write*: 1400MB/s
Interface	NVMe 1.3 with PCIe Gen3 X4 interconnect (2.0 specification requires 2 lanes only)				
Operating Voltage	+3.3V; Min = +3.0V, Max = +3.6V				
Max Operating Current	900mA for Gold & 1200mA for Cobalt				
ECC Engine	LDPC				
Power Management	Supports Power States (PS0, PS1, PS2, PS3, and PS4) with PS4 power consumption under 2mW				
Storing Temperature	-20°C to 85°C				
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
- 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

