

DATA SHEET

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Phantom® v-Series Family of Digital High- Speed Cameras

Key Features:

In 2009, we introduced several exciting new members of the v-Series family that bring a new level of price/performance to the high-speed imaging marketplace:

Phantom v210: Ideal for megapixel applications requiring around 2,000 fps. Attractively priced, yet packed with powerful features. A wide variety of options let you configure a camera that exactly meets your needs and budget.

Phantom v310: Unrivaled performance in its price range, the v310 is quickly becoming our most popular camera ever. It has the performance and features to adapt to a wide variety of applications. Get over 3,000 fps at megapixel resolution.

Phantom v640: Four megapixels with unsurpassed sensitivity. When you need maximum spatial resolution, but can't afford to give up speed or sensitivity, the v640 is the camera for you.

Phantom v12.1: The original speed demon. The award winning v12.1 camera was the first CMOS camera to break the 1,000,000 fps barrier. With a new price point, this speedster is the obvious choice for applications demanding speed, versatility, and proven performance.

Phantom v710: The newest speed demon, the v710 is capable of taking 1,400,000 pictures each second (at reduced resolution). This is the ultimate high-performance digital high-speed camera that will allow you to see things that no one has ever seen before.

AMETEK®
MATERIALS ANALYSIS DIVISION



Key Benefits:

WHEN IT'S TOO FAST TO SEE, AND TOO IMPORTANT NOT TO®

Whether you are studying crack propagation in a metal alloy, aerosol spray patterns, air flow around a side-view mirror, the biomechanics of an Olympian athlete, the efficacy of shaped explosive charges, or the effects of a bird strike on a jet engine, when you need a **high-speed imaging system** you can rely on, turn to Vision Research.

Our v-Series family of digital high-speed cameras has been around for over 15 years. The v2.0 was introduced in 1993. And, the v4.0 – in 1999 – was the first ever **CMOS-based digital high speed camera** introduced to replace film-based technology. We've been improving the state-of-the-art in high-speed imaging with each new family member introduced since then – whether the first-ever megapixel camera capable of taking 1000 frames-per-second (v5.0), the first-ever 4-megapixel camera (v10), the first digital camera to break the 1,000,000 frames-per-second (fps) barrier (v12), or the first high-speed imaging system qualified to fly on board a NASA space launch vehicle.

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v-Series



when it's too fast to see, and too important not to.®

These cameras all have a common set of breakthrough features that propel them ahead of any competition:

Widescreen Aspect Ratio: Take the wide view with a **1.6:1** aspect ratio – 25% wider than traditional square cameras. Keep more of your moving target in-frame longer.

CineMag Compatibility: Each camera has an optional Phantom CineMag interface. CineMags are non-volatile, hot-swappable, removable storage for Phantom cameras. **Now you can take multiple shots back-to-back**, saving each shot to the CineMag without the need for timely downloads between shots. Or, at recording speeds up to about 800 megapixels/second, record directly to the CineMag and achieve very long record times.

Internal Mechanical Shutter (optional on some models): All digital high-speed cameras require a periodic calibration to correct for differences in the analog characteristics of each photo site. Poor calibration results in pesky imaging artifacts that can both look bad and interfere with motion analysis software. This calibration requires that the sensor be completely shaded from light so a “black reference” can be established. This used to mean placing a lens cap on the camera during calibration. With Vision Research’s unique internal mechanical shutter, this lens shading can be automatically and/or remotely.

HD-SDI video ports: Each v-Series camera has two HD-SDI ports. On the v210 and v310, these ports output identical 4:2:2 HD-SDI signals (with an on-screen display available on one of them.) On the other members of the v-Series family, these Versatile Dual HD-SDI ports are configurable. They can be two identical 4:2:2 signals, a single dual-link 4:4:4 signal, or one can be configured for a 4:2:2 live feed, while the other is available for 4:2:2 slow-motion playback – ideal for use in sports broadcast.

Image-Based Auto-Trigger: Set up the camera to trigger based on changes to the live image. Trigger from hard-to-catch intermittent events, and even trigger multiple cameras simultaneously based on changes in the image.

Extreme Dynamic Range (EDR): By taking two exposures in a single frame, Vision Research’s unique Extreme Dynamic Range feature actually allows you to see detail in what otherwise might be overexposed areas of the image. Imaging “looking through” flames, or getting equally stunning detail out of both the dark areas and bright areas of a high contrast subject.

Automatic Exposure (AE): An essential feature when shooting outdoors, the camera exposure adjusts to lighting conditions. No more underexposed images when a cloud passes over, for example.

Camera	Resolution	FPS at Full Resolution	Maximum FPS	Minimum Exposure	Sensitivity (ISO-12232)		EDR / AE	Versatile Dual HD-SDI	Image-Based Auto-Trigger	Internal Mechanical Shutter	CineMag Compatible
					Mono	Color					
v210	1280 x 800	> 2,000	300,000	2 µs	20,000 T 6400 D	2500 T 2000 D	Yes	No, 2 xHD-SDI ports	Optional	Optional	Optional
v310	1280 x 800	> 3,000	500,000	1 µs	20,000 T 25,000 D	2500 T 5000 D	Yes	No, 2 xHD-SDI ports	Optional	Optional	Optional
v640	2560 x 1600	> 1,500	300,000	1 µs	16,000 T 6400 D	1600 T 1600 D	Yes	Yes	Standard	Standard	Optional
v12.1	1280 x 800	> 6,000	1,000,000 optional 680,000 standard	300 ns optional 1 µs standard	20,000 T 6400 D	2500 T 2000 D	Yes	Yes	Optional	Optional	Optional
v710	1280 x 800	> 7,500	1,400,000 optional 723,000 standard	300 ns optional 1 µs standard	20,000 T 6400 D	2500 T 2000 D	Yes	Yes	Standard	Standard	Optional

Focused

Since 1950, Vision Research has been shooting, designing, and manufacturing high-speed cameras. Our single focus is to invent, build, and support the most advanced cameras possible.

AMETEK Vision Research's digital high-speed cameras are subject to the export licensing jurisdiction of the Export Administration Regulations. As a result, the export, transfer, or re-export of these cameras to a country embargoed by the United States is strictly prohibited. Likewise, it is prohibited under the Export Administration Regulations to export, transfer, or re-export AMETEK Vision Research's digital high-speed cameras to certain buyers and/or end users.

Customers are also advised that some models of AMETEK Vision Research's digital high-speed cameras may require a license from the U.S. Department of Commerce to be: (1) exported from the United States; (2) transferred to a foreign person in the United States; or (3) re-exported to a third country. Interested parties should contact the U.S. Department of Commerce to determine if an export or a re-export license is required for their specific transaction.



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