

## DATA SHEET

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# Phantom® Miro® C210 Digital High-Speed Camera

The Compact & Flexible Solution  
for a variety of applications



Phantom Miro C210

### Key Benefits:

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

- 👁 Small, light & versatile, to meet a variety of applications
- 👁 1,800 fps at full 1280 x 1024 resolution
- 👁 128GB Phantom CineFlash® included

The Phantom Miro C210 digital high-speed camera weighs just over 1 lb. (.54 kg) and is just slightly larger than 3-inch cube (73mm x 73mm x 82.5mm), but packs enough **versatility** to make it the “go-to” camera for many applications. It's small size and strategically placed mounting holes make it easy to fit into small and difficult-to-mount places.

The C210 is compatible with all cables for Miro cameras, and comes with three connections for Ethernet, Power, and Capture, and a DIN 1.0/2.3 connector on the camera front for HD video.

### Key Features:

- 12-bit 1.3 Megapixel CMOS sensor
- 1,800 fps @ 1280 x 1024
- ISO (ISO 12232 SAT method):  
Mono: 2,500D\*; 5,000T\*  
Color: 640D\*; 640T
- Compact, rugged design
- Hi-G: 170G, IAW MIL-STD 202G,  
24Grms, IAW MIL-STD-202G
- Reversible mount for C & CS lenses
- Internal battery to protect data
- Phantom RCU compatible
- HD-SDI output
- 8GB or 16GB of RAM
- 128GB internal non-removable CineFlash included

\* Measured according to ISO 12232:2006 method

Miro<sup>®</sup> C 210

### Standard Phantom Image Tools make you a Pro!

Use simple Image Tools in PCC to bring out the details and enhance your Cine's image quality. Adjustments apply to the metadata, leaving the original Cine file unaffected. PCC has a whole suite of tools, including:

- Gain, Gamma, Brightness, Toe and Saturation
- White Balance
- Color and Tone adjustments
- Grid and Cross overlays
- Image rotation and flipping

Once the Cine is adjusted, convert it to a variety of formats to share, including Quicktime and AVI.

### Specifications

The Miro C210 is based on a 1.3 Mpx sensor with 2.3 Gpx throughput. This provides up to 1,800 frames-per-second (fps) at the maximum resolution of 1280 x 1024, and higher frame rates at lower resolutions, with very low noise to capture critical details. The minimum frame rate at all resolutions is 100 fps. This camera uses a 12-bit pixel depth, CMOS sensor, with 5.6 µm pixel size.

It is available in either Color or Monochrome and **makes the most out of available light**, with light sensitivity ISO ratings measured according to ISO 12232:2006 method:

	D (Daylight)	T (Tungsten)
Monochrome	2500	5000
Color	640	640

**Ideal for microscopy applications**, the C210 has a 1/2" image sensor format. Its dense, small pixel design provides a high level of detail and maximizes images captured through C and CS lenses. The C210 comes standard with a 1" C-mount, and can take advantage of a large selection of C and CS lenses.

The camera is available with either 8GB or 16GB of RAM that can be segmented up to 63 times to make shorter recordings back-to-back without missing any action. 16GB of RAM gives over 4 seconds of record time at maximum speed and resolution. The cameras come equipped with an internal, non-removable 128GB **Phantom CineFlash<sup>®</sup>** for nonvolatile memory. 8GB of data can download into the CineFlash in less than 1.5 minutes, maximizing camera "up" time. Data is downloaded to a PC via Gb Ethernet.

Ready for demanding environments, the C210 is rugged enough to withstand shocks of 170G and vibration of 24 grms, and has an internal battery to protect critical data as it saves to the CineFlash in the event of AC power loss.

### Research Enhancing Features

The Miro C210 accepts **all standard signals**, including Trigger, FSYNC, IRIG in, IRIG out, Ready, Strobe, Event and Memgate, **to support any experiment**. It also has many features to enhance analysis and research efforts, including:

- **Seamless Cine Switching:** Some applications require multiple back-to-back cines into segmented memory, and cannot afford to lose a single frame of critical data when switching from one cine to the next cine. Depending on trigger positions, the C210 accomplishes this feat as an automatic feature.

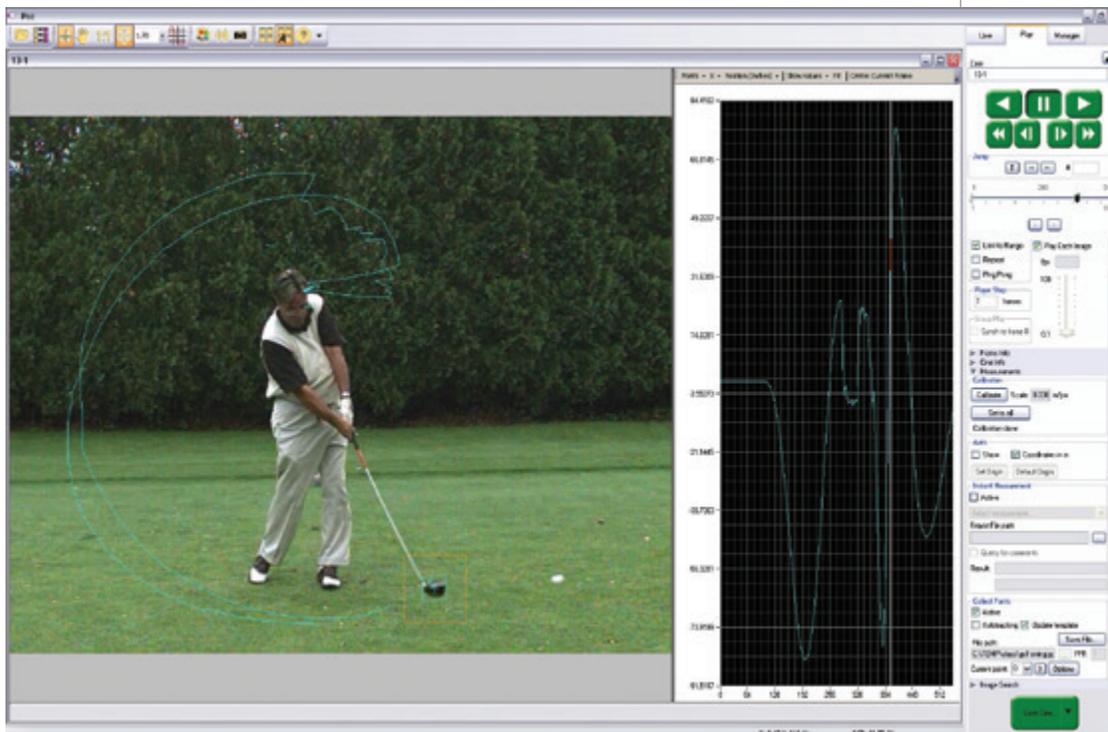
- **Image-Based Auto-Trigger:** Trigger the camera (or even a number of connected cameras) from motion detected within the live image. This makes it easier to catch events that are not predictable and may occur infrequently.
- **Continuous Recording:** For events that happen rarely or unpredictably, continuous recording mode is ready. It automatically saves a cine to a connected PC immediately after it is recorded, then re-arms the camera and waits for the next cine. A recording can be triggered manually, from an event detection system, or even by our Image-Based Auto-Trigger. The number of recordings is limited only by the amount of available disk storage.

Maximum Frame Rates	
Resolution	FPS
1280 x 1024	1,800
1280 x 720	2,540
768 x 768	2,385
640 x 480	3,760
512 x 512	3,530
384 x 288	6,100
256 x 256	6,810
128 x 128	12,700
64 x 8	67,140

### Motion Analysis Capability

The Miro C210 uses Phantom Camera Control (PCC) software, and takes advantage of the **comprehensive Motion Analysis features** built into the software. PCC can perform timing, position, distance, velocity, angle and angular speed measurements, and track multiple points or objects to compute and graph their XY-coordinates, speed, or acceleration. The software has several proven edge detection algorithms and image processing tools to enhance motion analysis.

PCC also provides a Collect Point (tracking) tool to compute the position, speed, acceleration, and/or generate motion graphs of a point (or object) or multiple points (up to 99), with respect to the image plane, over time.



PCC Motion Analysis Capabilities

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## Phantom® Miro® C210 Digital High-Speed Camera

### Additional Features:

- Seamless Cine Switching
- Image-Based Auto-Trigger (IBAT)
- Continuous Recording
- Auto-Exposure
- Multi-cine Acquisition
- Gb Ethernet
- Rechargeable Battery
- Size and Weight:
  - 1.2 lb, 0.54 kg;
  - 2.9 x 2.9 x 3.25 inches
  - 73 x 73 x 82.5 mm (H x W x D)
- Operating Temperature:
  - 0° C to 50° C
- Tiered Service Contracts to protect your investment

### 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.



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## Enhance your workflow with Phantom Accessories

### Miro Mini-BoB

The Mini-BoB is a simple and reliable way to control the Miro C210, with BNCs for the signals. Just connect the Mini-BoB to the camera capture port, and connect to the Mini-BoB's BNC for the desired signal, and it's ready for use.



### Remote Control Unit (RCU)

The Miro C210 is compatible with the Phantom Remote Control Unit (RCU). The RCU is a valuable accessory, offering simple local set-up and complete control when the camera is mounted remotely.

### Vision Research Global Support - for wherever you are

Our Miro C-Series Digital High-speed camera line is supported by Vision Research's Global Service and Support network offering AMECare Performance Services from multiple sites around the globe. Maximize the value of your Phantom camera by learning more about our service and support options at [www.visionresearch.com/Service--Support/](http://www.visionresearch.com/Service--Support/)



*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.*