Phantom Miro 310/311LC

**Datasheet**

**Mechanical Drawing R Series**

**Mechanical Drawing LC Series**

**Mechanical Drawing LAB Series**
Introducing the third generation of Phantom Miro cameras. Small, lightweight, rugged and packed with advanced features. The most accessible high-speed cameras available today, Miro cameras are ideal for a huge variety of applications that require moderate frame rates at common resolutions.

The Miro 310 performance level is available in four body styles. The new LAB-Series is ideal for indoor, laboratory environments. The R-Series is a rugged camera for harsher environments. The LC-Series has a flip-out LCD touchscreen interface for camera control and cine playback.

The Phantom Miro 310 is a 1 megapixel camera with 3.2 Gigapixels/second (Gpx/s) throughput. This translates to over 3,200 frames-per-second (fps) at full 1280 x 800 resolution. Frame rates up to 650,000 fps are available at reduced resolution. The minimum digital...
exposure is 1µs and is available in both color and monochrome versions.

Each Miro camera is compatible with Vision Research's new and unique CineFlash storage technology. These removable, non-volatile storage devices slide into the camera body and provide a way to quickly save shots from the camera's memory without the need for time-consuming and costly downloads. Later, remove the CineFlash module from the camera and insert it into the docking station connected to a computer. Cines stored on the CineFlash are now immediately available on the computer. You can also transfer the cines from the camera to your computer and edit the images using our Phantom Camera Control software (PCC). When ordering your camera, just specify if you want 120GB or 240GB CineFlash storage. A 120GB CineFlash and Dock come with every R or LC camera purchase!

The R and LC Series come with a battery that can power the camera when AC power is not available or is lost during an experiment.

Each Miro camera supports four lens mounts: Nikon F/G, C, PL or EOS. EOS mounts allow the use of Canon EF and EF-S automated lenses. Adjust lens aperture and focus remotely using our Remote Control Unit or Phantom Camera Control software.

These cameras also have a number of other advanced features including an internal capping shutter, Image-Based Auto-Trigger, camera synchronization, immediate playback of recorded cines, and more!

What's in the Box...

- Power supply
- Ethernet cable
- Battery, battery charger (not available on LAB-Series)
- 120GB CineFlash and Dock (optional on LAB-Series)
- Capture cable (not required on LAB-Series)

* Measured according to ISO 12232:2006 method

Note: The high speed movies are all taken with this camera. They have been greatly reduced in
resolution and compressed in size so we can show them to you on the web. Movie quality directly from the camera is superior to what you will see here.

{slide= Shadowgraph of a miscible drop falling in a stratified fluid }
Taken with a Phantom Miro M310 and an Infinity K1 lens.
UNAM Facultad de Ciencias - México - Taller de Hidrodinámica
{youtube}dx7whkw1B0{/youtube}

{slide= Visualization of shock waves emitted from a trumpet bell and their interaction with several objects }
Taken with a Phantom Miro M310.
UNAM Facultad de Ciencias - México - Taller de Hidrodinámica
{youtube}adJEumpIN9M{/youtube}

{slide= Visualization of currents inside an oscillating }
Taken with a Phantom Miro M310.
UNAM Facultad de Ciencias - México - Taller de Hidrodinámica
{youtube}FzBqUBB_MeY{/youtube}

{slide= Dynamical behavior of an oscillating drop - 3600 fps }
Taken with a Phantom Miro M310 and a Infinity K1.
UNAM Facultad de Ciencias - México
{youtube}7P_c1_peG4o{/youtube}
Critical phenomena of a drop crossing a stratified fluid - 100 fps
Taken with a Phantom Miro M310
UNAM Facultad de Ciencias - México
{youtube}Txsw2NcUW2A{/youtube}

Ring Vortex - 100 fps
Taken with a Phantom Miro M310
UNAM Facultad de Ciencias - México
{youtube}gYYn09ITbDs{/youtube}

Xylophone

Drop of water falling on a 5 Pesos coin - 600 fps
Taken with a mono Phantom Miro M310.

Make sure to visit our Channel!
Phantom Miro 310

- Popular Accessories
- Options
- Ships Standard with
- API's
- Environmental Specifications
- Supported File Formats
- Motion Analysis
- Lensing
- Video Out
- Camera Control
- Ethernet Connection
- Signaling
- Timing & Synchronization
- Triggering
- Special Features
- Record Times
- Memory
- Exposure
- Sensor Specifications
- Short Description
- Phantom Miro 310
  - 128 x 128
  - 256 x 256
  - 384 x 288
  - 640 x 480
  - 896 x 720
  - 1280 x 720
  - 1280 x 800

Resolution/Speed (fps)

- Additional CineFlash modules
- Spare batteries, battery charger
- Remote Control Unit
- While CineFlash is available for the LAB style camera, there is no bundled CineFlash or Dock
- Upgrade bundled 120GB CineFlash to 240GB
- PCC software
- 120GB CineFlash and Dock (not bundled with LAB style)
- (No battery with LAB style)
- Battery: Sony BP-U30 or BP-U60 rechargeable, external charger required
- Ethernet cable
- Power supply
- MatLab
- LabView
- See chart (add link)
- See chart (add link)
- Battery not available on LAB style
- Rechargeable battery (Sony BP-U30 or BP-U60)
- 12 - 28 VDC, 40 W

- Cine, Cine Compressed, Cine RAW, AVI, Multipage TIFF, MXF PAL, MXF NTSC, QuickTime, Windows BMP, OS/2 BMP, PCX, TGA, TIFF, LEAD, JPEG, JTIF, RAW, DNG, DPX
- Compatible with 3rd party solutions
- Angles and Angular Speed
- Speed
- Distance
- Basic measurements via Phantom Application:
- National Instruments X- and M- series
- Native Support in PCC
- Scale
- Crop
- Image flip and rotate
- Color matrix
- Filters
- Tone curve
- Pedestal
- Flare
- White Balance
- Hue
- Saturation
- Gamma
- Gain
- Brightness
- PL-mount
- 1" C-mount
- Nikon F mount adapter (allows the use of F-mount lenses on EOS mount)
- Nikon F-mount
- Canon EOS
- The following mounts are available:
- Analog video out (NTSC or PAL) available on Capture Cable or Power connector (with optional cable)
- SDK available
- Remote Control Unit (RCU)
- Phantom Camera Control software (PCC)
- Gb Ethernet for control and data
- In software there is an Aux3 assignment that allows IRIG Out to be reassigned to Strobe
- Dedicated FSYNC and Trigger connection on camera body
- (Aux2 signal can be assigned to Ready or Strobe)
- (Aux1 signal can be assigned to FSYNC, Event, Strobe or Memgate)
- On the R and LC styles: Capture connector (Trigger, IRIG In, Video, IRIG Out, Aux1, Aux2)
- IRIG Out (unmodulated)
- IRIG In (modulated or unmodulated)
- 20ns timing accuracy
- Hardware trigger BNC
- Trigger from software
- Programmable trigger location (pre/post trigger recording)
- Secondary IP address
- Standard internal mechanical shutter for automatic/remote Current Session Reference (CSR)
- 500 ns straddle time
- IRIG Out (unmodulated) (not available on LAB style)
- IRIG In (modulated or unmodulated)
- Frame timestamp
- Event marking
- Memory gate
- Continuous recording
- Image-Based Auto-Trigger
- Segment memory for up to 63 cines in multi-cine mode
- 2.3 seconds at maximum frame rate, 12-bit depth, largest resolution and into maximum internal memory
- Slot for CineFlash support
- 6GB, 12GB high-speed internal RAM
- Shutter Off mode for PIV applications
- Extreme Dynamic Range (EDR)
- 1 µs minimum exposure
- Full well capacity (typical): 26300e-
- Dynamic range: 57.7 dB
- Fill factor: 56%
- CAR in 64 x 8 increments
- TE cooled
- ISO Mono 6,400D; 16,000T
- 12-bit depth
- 25.6 mm x 16.0 mm
- 20 µm pixel size
- 1280 x 800 pixels
- Shutter speeds down to 1 microsecond
- Maximum speed at reduced resolution of 64 x 8 is 650,000 fps
- Maximum speed at full resolution of 1280 x 800 is 3200 fps
- 3.2 Gpx/s

One megapixel, 1280x800 resolution at over 3000 frames-per-second. This little powerhouse is packed with performance and features that frees you from an AC power outlet are just a few of the features you will love. Available in R, LC and LAB styles.

Light weight, rugged, portable, easy to learn and use. Our most accessible camera ever.