



PHANTOM[®]

Miro C

DATASHEET



PHANTOM Miro[®] C321J Miro[®] C321

COMPACT
HIGH-SPEED CAMERA

1,480 fps at full HD (1920 x 1080) resolution
Small and rugged
Flexible, with 2 models

FEATURES & BENEFITS

HIGH QUALITY HD IMAGES IN A COMPACT AND FLEXIBLE CAMERA

- Maximized image quality for reliable data even in challenging environments.
- "Set Default CSR" feature for consistent images on power-up, eliminating the need for CSR.
- 2 body types for specific system needs - the C321J for multi-camera set-ups with the Miro Junction Box, and the C321, for stand-alone use, or connected to the JBox with an adapter. They blend perfectly with Phantom off-board cameras for a full family solution.
- Proven design and independently tested rugged up to 170G. Tough, easy-to-use single cable system to Junction Box.

FOCUS ON DATA PROTECTION AND MANAGEMENT

- Internal, non-removable battery for data protection in case of power loss
- 240GB of internal Flash keeps data safe
- 8GB or 16GB of RAM, with up to 63 partitions for multiple shots

IMAGE & SENSITIVITY

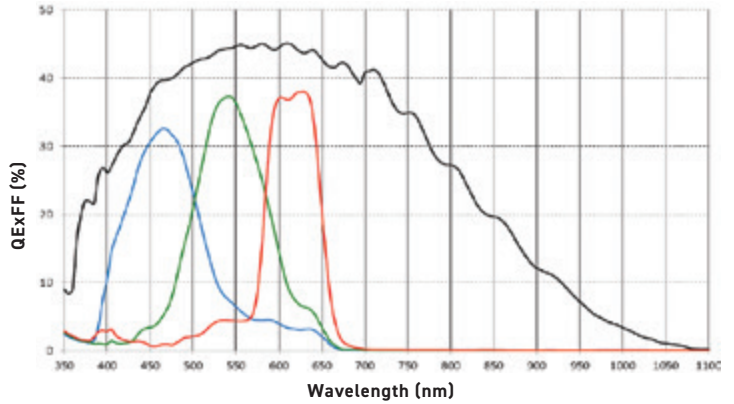
Sensor Type	CMOS, with Global Shutter
Maximum Resolution	1920 x 1080
CAR Increments	640 x 8
Pixel Size	10 μm
Sensor Size	19.2 x 10.8 mm; 22.03 mm diagonal
Bit Depth	10 bit
EMVA 1288 Measurements (at 532 nm)	
Quantum Efficiency %	45.3% mono 31.5% color
Max. SNR (dB)	37.4
Absolute Sensitivity Threshold (p)	33.5 mono 43.3 color
Saturation Capacity (e-)	5501 mono 5311 color
Temporal Dark Noise (e-)	14.55
Dynamic Range (dB)	51.2

- Reported measurements were taken at 532 nm with both monochrome and color cameras

- Visit: www.phantomhighspeed.com/emva for more information on EMVA 1288

SPECTRAL RESPONSE

Quantum Efficiency Monochrome and Color



Miro C321 / C321J Connectors With the Miro Junction Box 2.0

CONNECTIVITY & SIGNALS

	C321J	C321
Ethernet	Gb Ethernet accessed through System Cable	Gb Ethernet accessed through Fischer Connector
Timecode	IRIG In & Out- Unmodulated	IRIG In- Modulated/Unmodulated; IRIG Out - Unmodulated
Port Descriptions	Fischer 27-pin System port, for Trigger, IRIG In/Out, Strobe, Event, Memgate, FSYNC, READY Out, Programmable I/O, Power from J-Box	Fischer 12-Pin Capture port, for Trigger, IRIG In/Out, Strobe, Event, Memgate, FSYNC, READY Out, and Programmable IO Signals from MiniBoB
		Fischer 8-pin Gb Ethernet
		Fischer 6-pin Power
Programmable IO Signals	Programmable I/O for Fsync, Strobe, Ready, Timecode-out, Event, Memgate, Pretrigger. Assign and define signals in PCC	
Hardware Trigger	System cable, to Jbox	Capture port, to MiniBoB
Software Trigger	via PCC over Ethernet; via Image Based Auto trigger (IBAT)	
Synchronization	External Sync via FSYNC or IRIG Timecode	
Recording Features	Burst mode, Continuous recording & AutoSave to internal Flash	
Video Output	HD-SDI, through DIN connector on camera front	



MEMORY & STORAGE	
RAM Buffer	8GB, 16GB RAM
Multi-Cine	Up-to 63 Partitions
Non-Volatile Media	240GB of internal Flash included

FRAME RATES & EXPOSURE	
Top FPS at Max Resolution	1,480
1 Megapixel FPS	1,990
Maximum FPS	94,510
Minimum FPS	50
Minimum Exposure	1 μ s
PIV Features	Shutter-off mode straddle time = 1180ns Supports Burst Mode
Exposure Features	Auto Exposure

FRAME RATE CHART

Table provides examples of common resolutions and frame rates. The record times shown are for 8GB RAM at the frame rate shown. Duration will be double for 16GB.

Maximum Frame Rate - FPS; (8GB Record time - Sec)	
Resolution (H x V)	Miro C321J / C321
1920 x 1080	1,480 (2.24)
1920 x 800	1,990 (2.25)
1280 x 1024	1,560 (3.36)
1280 x 512	3,090 (3.39)
640 x 480	3,290 (6.8)
640 x 128	11,765 (7.16)
640 x 64	22,070 (7.60)
640 x 8	94,510 (14.2)



CONTROL

Software & OS	Phantom PCC (Windows x64); SDK available for C/C++, C#, Python, MatLab and LabView
Primary File Format	Phantom Cine RAW (.cine)
Alternative File Formats	Easily convert to formats including .mp4, Apple ProRes .mov, .avi, Tiff, JPG, DNG and many more using PCC. Cine files are directly compatible with many major video editing and motion analysis programs.
Software Features	"Set New CSR Default" for stable black reference, Auto-Save to Flash, Continuous recording, Advanced Image Tools and Processing

MECHANICAL

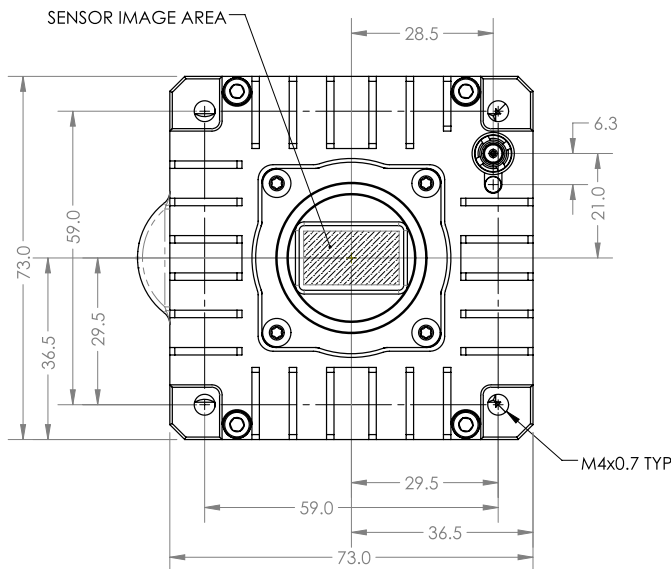
Housing Variants	C321J and C321
Size	C321J: 2.9 x 3.1 x 3.4" (73 x 79.5 x 87.2 mm); C321: 2.9 x 2.9 x 3.4" (73 x 73 x 87.2 mm)
Weight	1.2 lbs (0.54 kg)
Lens Mounts	1" C-mount, 4/3" lens recommended
Mounting Points	4 x 1/4-20, 10 x M4
Cooling	Active cooling. Quiet mode disables fans during capture.

POWER

AC Power	100 - 250 VAC, 40W power supply included with C321 Model
Voltage Range	16-36VDC
Power Consumption	13 W typical, up to 22W when charging battery
Battery Options	Internal battery included for data protection

ENVIRONMENTAL

Operating Temperature	0 to +50°C
Storage Temperature	-20 to +70°C
Relative Humidity	5% - 95%
Operational Shock	170G, sawtooth wave, 6ms, +/- 10 pulses all axes
Operational Vibration	24 Grms, IAW MIL-STD-202G Method 214-A.; Test Condition G, 15 min per axis
Regulatory	Emissions – CE & UKCA Compliant EN 61326-1, Class A Immunity – CE & UKCA Compliant EN 61326-1, Class A FCC – CFR 47, Part 15, Subpart B & ICES-003, Class A KC Emissions – KC Compliant - KS C 9832 KC Immunity – KC Compliant - KS C 9835 Safety – IEC 60950-1 (2012)



GLOBAL SUPPORT NETWORK

The Phantom Miro C cameras are supported by Vision Research's Global Service and Support network, offering PhantomCare service from multiple sites around the globe. Maximize the value of your Phantom camera with professional support services designed to meet your needs.

Learn more about our service offering at www.phantomhighspeed.com/Support

ABOUT VISION RESEARCH

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



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