

# Firefly<sup>®</sup> MV

SMALL + INEXPENSIVE + USB OR I394



1394a (FFMV)

USB 2.0 (FMVU)

- 14 different combinations of form factor and interface
- 1394a or USB 2.0 digital interface
- Ultra compact at 44 x 34 x 24.4 mm
- Under \$200\* USD

The Firefly MV line offers a total of 14 different combinations of form factor and interface that are designed to address a wide variety of applications in industrial and non-industrial imaging, such as object and gesture tracking, optical character recognition (OCR), augmented reality, and multitouch interface technology.

\*0.3MP model only, when purchasing 5 or more cameras.

Specification	FFMV-03M2M/C (BW or Color)	FMVU-03MTM/C (BW or Color)	FMVU-13S2C (Color)
Image Sensor Type	1/3" progressive scan CMOS		
Shutter Type	Global shutter using Micron TrueSNAP™ technology		Rolling shutter
Image Sensor Model	Micron MT9V022		Sony IMX035LQR-C
Maximum Resolution	752 (H) x 480 (V)		1328 (H) x 1048 (V)
Pixel Size	6.0 μm x 6.0 μm		3.63 μm x 3.63 μm
Analog-to-Digital Converter	On-chip 10-bit ADC		On-chip 10 / 12-bit ADC
Video Data Output	8 and 16-bit digital data		
Image Data Formats	Y8, Y16 (monochrome), 8-bit and 16-bit raw Bayer data (color models)		
Digital Interface	6-pin IEEE 1394a for camera control, video data, power	5-pin Mini-B USB 2.0 for camera control, video data, power	
Transfer Rates	400 Mb/s	480 Mb/s	
Maximum Frame Rate	752x480 at 60 FPS • 320x240 at 112 FPS (region of interest) 320x240 at 122 FPS (2 x 2 pixel binning)		Free-running acquisition: 1328x1048 at 23FPS, 664x524 at 60 FPS (2x2 pixel binning) 640x480 at 60 FPS (center cut-out mode) Triggered acquisition: Frame rate is half the specified rate. Maximum frame rate in external trigger mode: 30FPS
Partial Image Modes	pixel binning and region of interest modes via Format_7		pixel binning or center cut-out (640x480) mode via Format_7
General Purpose I/O Ports	7-pin JST GPIO connector, 4 pins for trigger and strobe, 1 pin +3.3 V, 1 Vext pin for external power		
Gain Control	automatic / manual, 0 dB to 12 dB		automatic / manual, 0 dB to 18 dB
Shutter Speed	automatic / manual, 0.12 ms to 512 ms		automatic / manual, 0.03 ms to 8000 ms
Gamma	0 to 1 (enables 12-bit to 10-bit companding)		0.5 to 4.00
Synchronization	via external trigger, software trigger, or free-running <sup>1</sup>	via external trigger	
External Trigger Modes	I IDC v1.31 Trigger Modes 0 and 3		
Power Requirements	8 to 30 V via IEEE-1394, less than one (1) Watt	4.75 to 5.25 V via the Mini-B USB 2.0 or GPIO connector, less than one (1) Watt	
Dimensions (L x W x H)	24.4 x 44 x 34 mm		
Mass	37 g (including tripod adapter)		
Camera Specifications	I IDC 1394-based Digital Camera Specification v1.31		
Memory Storage	three memory channels for user configurable power-up settings		
Lens Mount	CS-mount (5mm C-mount adapter included) • M12 microlens mount <sup>2</sup>		
Compliance	CE, FCC Class B, RoHS		
Operating Temperature	0° to 45°C		
Storage Temperature	-30° to 60°C		
Warranty	1 year		
Configuration Options	board-level <sup>2</sup> • microlens <sup>2</sup> • mini 1394 connector <sup>2</sup> • metal case		

<sup>1</sup> Using standard non-Format\_7 video formats and modes operating at 30 FPS and 60 FPS only.

<sup>2</sup> For qualified OEMs

# Firefly<sup>®</sup> MV Specifications

## Plug and Play

The Universal Serial Bus (USB) 2.0 and IEEE-1394a standards provide high bandwidth interfaces that are well-suited for digital imaging, and are some of the most well-established and popular serial interfaces in use today. Both interfaces are widely available on a variety of hardware platforms, including Macintosh and PC systems, and a variety of laptop, desktop, and small form factor (embedded) systems. PC interfaces such as built-in, PCI, PCI Express, CardBus or ExpressCard are supported.

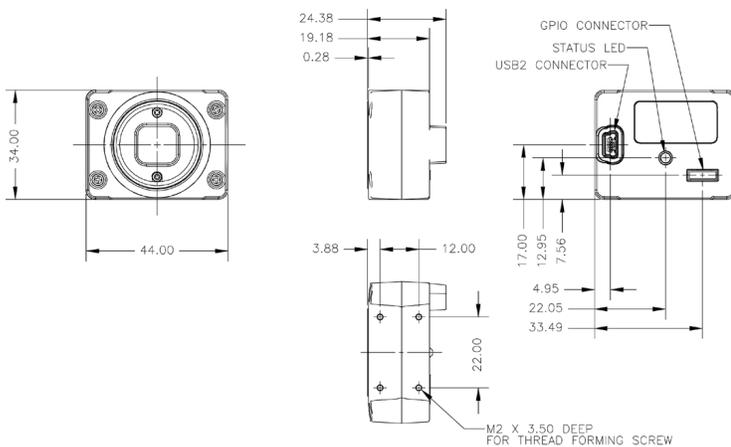
## Digital Interfaces for Power and Control

Both USB 2.0 and 1394a provide power and data over one cable which minimizes the need for additional cables or external power sources. The 1394a FireflyMV is ideal for multi-camera applications, while the new USB 2.0 model is ideal for single camera applications that can be supported on multiple hardware platforms. The camera also provides a 7-pin general purpose I/O connector. The GPIO connector can be used to synchronize the camera to external devices, such as an external trigger source, power external circuitry, or power the camera via an external device.

## Dimensional Drawings

Measurements in mm

CAD drawings for board level are available online at [www.ptgrey.com/support](http://www.ptgrey.com/support)



## Development Kit

This kit has all the hardware and software required for rapid design and prototyping, including a license of the FlyCapture<sup>®</sup> software development kit (SDK), data cable, and GPIO wiring harness. The FlyCapture software development kit (SDK) is included with all Point Grey Imaging Products. The SDK is designed to allow image acquisition and camera control, and comes with a variety of C/C++ source code examples.

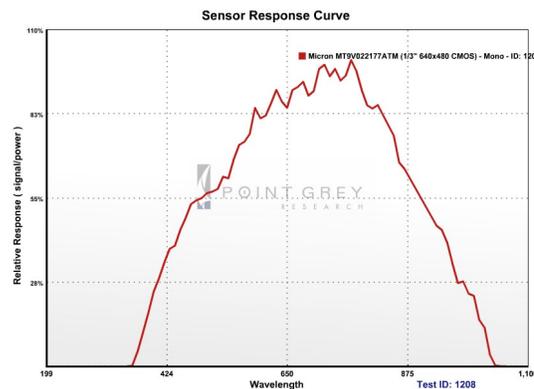
## Updatable Firmware

The field-programmable gate array (FPGA) chip controls all camera functionality, including exposure, resolution and frame rate, pixel binning, user memory channels and more. It can also be updated with new functionality in the field.

## Near-IR Performance

The monochrome Firefly MV is highly sensitive in the near-IR with QE greater than 35%.

FFMV-03M2 / FMVU-03T2



FMVU-13S2C

