



Intelligent Video Applications

With Liquid Lens by **varioptic**

A drop of genius of genius

IVINTM2M-ETH

Intelligent Video Input, 1600 x 1200 Progressive Scan,
with 10/100 Ethernet and *Varioptic Liquid Lens Focus*

Product Overview

The IVIN2M-ETH is a progressive scan, 1600x1200 resolution, 1/3", YUV color, or monochrome, digitally interfaced network camera. The IVIN2M-ETH interfaces to a host computer using 10/100BaseT Ethernet.

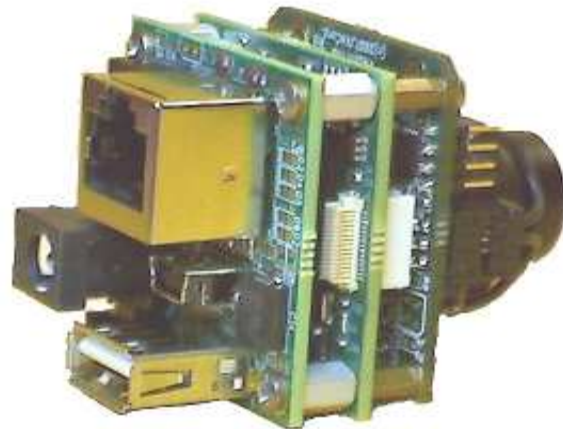
Measuring 37mm x 37mm (1.45" x 1.45"), the IVIN2M-ETH is a low power, high performance CMOS image acquisition device. Images are acquired using progressive scan at up to 30 Frames Per Second.

Manual or auto gain, exposure, and white balance may be programmably selected in order to optimize the imager analog output to the input range of the 10-bit A/D converter(s).

Output resolution is independent of input window, so digital zooming is possible. For example the entire 1600x1200 field of view can be digitally filtered/zoomed down to a 640x480 output, and the size and position of the input field can be varied all the way down to a 640x480 window anywhere within the 1600x1200 field of view, thus achieving 2.5:1 electronic zoom with no loss of precision.

The optional *Varioptic Liquid Lens* focus mechanism allows from close-up to infinity manual or *Auto*-focus done completely electronically with no moving parts. The nominal focus distance at power-up may be specified at order time. The user has complete real-time control over focus during operation, and in addition, the power-up default focus may be changed by the user and stored in on-board non-volatile memory, thus allowing post-installation "tuning" to be done to eliminate any mechanical adjustments once the device has been installed.

An integrated 200MIPS ARM926EJ-STM processor with 64MB SDRAM running Linux performs camera control and Ethernet operations.



Applications

- Biometrics (excluding iris identification due to contractual agreements)
- Surveillance, Warning Systems
- Security Systems
- Vision Applications
- General Image Processing

Features

- Auto focus liquid lens technology from Varioptic
- Available with lenses from 5.1mm to 35mm focal lengths (see lens information for details)
- Digital 2.5X zoom range
- Programmable camera resolution up to 2 Megapixels (1600 x 1200) @ up to 30 frames/sec (5 Megapixel version available June 2008)
- Ethernet for image transfer, optional USB for flash memory
- Onboard 32-bit, 200MIPS ARM Processor with memory
- RGB or YUV Color or Monochrome (selectable)
- Uncompressed BMP or compressed JPEG single images
- Compressed AVI MJPEG (for real time direct to disk stream recording)
- Very low power consumption (less than 500ma @5v)
- Optional Enclosure (available June 2008)



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Mechanical/Electrical

- Printed circuit motherboard/daughterboard, 37mm by 37mm (1.45" x 1.45") with 4x M2.5 mounting holes at corners.
- Standard M12 x 0.5 lensholder for non-liquid lens version, Liquid lens version uses custom lens/lensholder.
- 10/100BaseT Ethernet RJ45 Interface.
- Low power, supplied by external power converter or optionally, by USB.
- Optional USB Device interface for connection to flash drives etc.
- Optional MMC/SD card connector for connection to MMC/SD cards.interface for
- Optional 802.11B/G wireless Ethernet interface for un-tethered operation
- Complete control of on-board camera functions over Ethernet

Lens Information

Hi-res lenses have MTF's compatible with the 1600x1200 sensor. Standard resolution lenses are also available for higher magnification applications and greater depth-of-field fixed focus applications. Other non-standard focal lengths may also be available, check with factory.

Hi-res lenses offered for use with the IVIN-2M, with or without liquid lens focusing are as follows:

- 5.1 mm f2.8 (dig zoom 5.6mm - 12mm)
- 8.0 mm f2.0 (dig zoom 8mm - 20mm)
- 12.0mm f2.0 (dig zoom 12mm - 30mm)

Standard resolution lenses offered for use with the IVIN-2M are as follows. Note that higher f numbers allow more depth of field.

- 16.0mm f2.5 or f7.0
- 25.0mm f2.5 or f3.55 (not currently usable with liquid lens)
- 35.0mm f2.0 or f4.0 (not currently usable with liquid lens)

Software

For the initial release software, at the most basic level the IVIN2M-ETH appears to the host computer as an FTP server which provides live images via standard FTP network protocols. Layered over this is the standard IvIn API which is also available for the IVIN2M-USB camera, so higher level functionality is comparable.

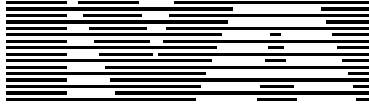
A standard Windows application is provided which includes the following functions:

- Acquire live video to screen using hardware video overlays.
- Capture single images to BMP or JPG files.
- Stream video to disk as AVI MJPEG file.
- Set video size, clock rate, color or monochrome.
- For liquid lens equipped cameras, adjust focus (with slider), Autofocus.

Low level camera interace software and drivers are also be available for custom user applciations.

The Windows demo app supports selection of the following:

- Preview sizes: 320x240, 384x288, 512x384, 640x480, 704x528, 768x576, 800x600, 1024x768
- Pixel Clock Rates: 20mHz, 27mHz, 33mHz, 40mHz, 60mHz, 80mHz, 30/60mHz, 40/80mHz (the dual modes are for preview/capture, where a higher clock rate is useful for higher resolution capture formats)
- Color or Monochrome for all sizes/rates
- Field of View: 1600x1200 or 1344x1008
- Preview sizes: 320x240, 384x288, 512x384, 640x480, 704x528, 768x576, 800x600, 1024x768
- Still Capture Format Selection: BMP, JPG Hi Qual, JPG Med Qual, JPG Low Qual
- Stream Capture Format Selection: AVI MJPEG, Individual JPG files
- Still/Stream Capture Sizes: 1600x1200, 1344x1008, 1280x960, 1024x768, 800x600, 768x576, 704x528, 640x480, 512x384, 384x288, 320x240



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Imager Specifications

- Sensor Resolution 1600 x 1200 pixels
- Pixel Size 2.8um x 2.8um
- Image Size 4.73mm x 3.52mm
- Frame Rate 30 FPS max at 640x480 output (including full 1600x1200 field zoomed down), or 15FPS for full 1600x1200 output, may be affected by Ethernet and host bandwidth capabilities.
- Sensitivity 1.0 V/Lux-sec
- S/N Ratio >42 dB
- Dynamic Range >71 dB
- Operating temp. -20 to 60c (with liquid lens)
- Operating temp. -30 to 70c (without liquid lens)
- Storage temp. -40 to 85c (with or without liquid lens)

Ordering Information

A standard evaluation kit including camera with tripod mount, hi-res lens with Varioptic liquid lens, Ethernet cable, Power Supply, and software CD will be available. The order code is:

IVIN2M-ETH-x.xyyyy-option...

where x.x may be 5.1HRLL (for 5/1mm hi-res lens), 8.0HRLL (for 8.0mm hi-res lens), 12.0HRLL (for 12.0mm hi-res lens), or 16.0LL (for 16.0mm standard-res lens). The 5.1mm hi-res lens is recommended for wider field of view applications, the 16mm lens is recommended for close-up hi-magnification applications..

A standard IR cut filter is included, which will prevent IR from reaching the sensor and disturbing color quality. For special applications, include -NOIR to exclude this filter.

The 16.0mm lens will be set up in a normal fashion with focus out to infinity, or a Macro mode that allows focus from very close (less than 1 inch) to approximately 1 foot may be specified, include -MACRO to choose this mode.

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