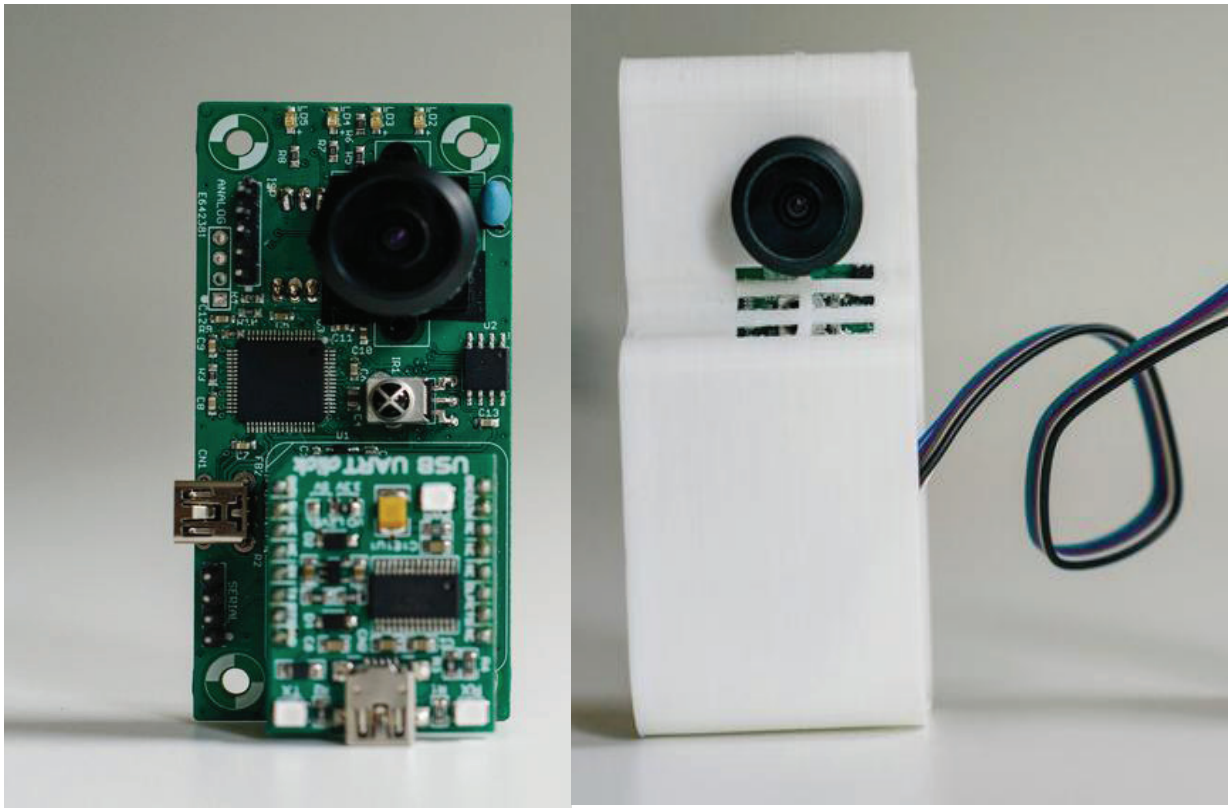
# introducing the Silicam igo



The SiliCam RIK is a fully programmable embeddable stereo camera, which provides simple vision capabilities to small-embedded systems in the form of an intelligent camera.

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**Sensors:** IGO houses 1 synchronized 30x30 pixels image sensors that are capable of frame rates up to 100fps. The lens holders accept any M12 x 0.5mm lenses as used in small surveillance cameras and webcams.

**Processing:** Processing is performed by a dsPIC33EP256GP806, running at 140MHz and giving 70 MIPS performance. This processor has an advanced DSP pipeline giving ample performance for several image processing tasks. All input and output streams are dealt with by SPI-DMA channels leaving all processing power for the application. With this horsepower typical applications such as motion detection, motion estimation, tracking and depth estimation reach easily speeds far over 30 fps. Next to the internal memory, the board is equipped with an additional 1Mbit SRAM of external memory.

**Connections:** As communication interfaces, the RIK has an USB 2.0 port and a debug TTL UART connector. Also, it houses a mikrobus connector for future extensions (http://www.mikroe.com/click/)

**Programming:** Silicam IGO can be programmed in C and C++ using the free MPLABX environment with the xc16 compiler (available as a free student version). Programs are downloaded through the ICSP connector on the board.

**Powering:** the board is directly powered using the usb port. Alternatively, it can be powered by batteries at 5V. On- board, the input

voltage is stabilized to 3.3V. A low-battery warning is raised if the battery voltage goes below 3v. n be powered by batteries. On-board, the

input voltage is stabilized to 3.3V. Preparations are implemented for low-battery warning.

**Applications:** Despite the low resolution, several applications have already been shown on this hardware including background detection, face detection, vehicle classification, speed measurement, motion detection and estimation and depth estimation.

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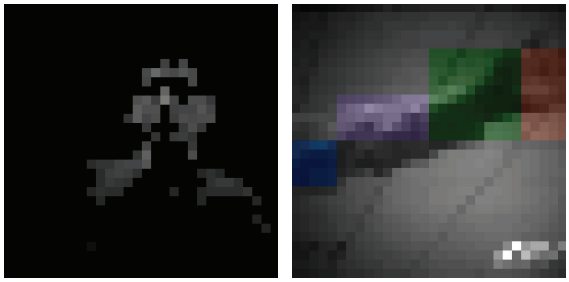
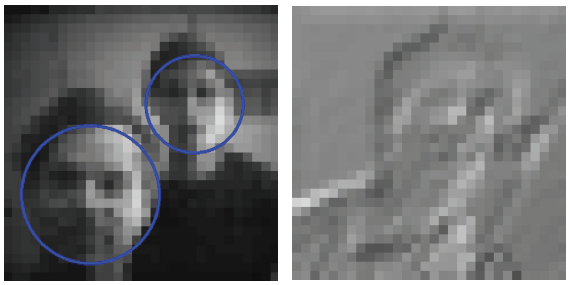


Despite the small resolution complex vision applications are still possible such as background subtraction, depth map, face recognition and edge detection



## Provided Firmware

The board comes already programmed with a demo firmware in xc16 (open source code) that captures and sends stereo images over serial at 1500000 bps (100fps/camera)

Fully open source and re-programmable libraries in xc16 (Compilable with the free student version) are also provided including:

- Camera library (DMA based)
- RF module library (PACKET mode and CONTINUOUS mode)
- Serial communication library (DMA based)
- External Memory library
- IR module library

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|---|---|
| Resolution | 30x30 pixels |
| Number of sensors | 1 monochromatic CMOS sensors |
| Frame Rate (per sensor) | Up to 100fps |
| Microcontroller | Microchip DSPIC33EP256GP806 |
| Operating Voltage | 3.3V |
| Input Voltage | 3.3-12V through a USB port |
| Digital I/O Pins | 9 |
| Analog Input Pins | 3 |
| DC Current per I/O Pin | 15mA |
| DC Current for supply | 120mA @5v |
| Flash Memory | 512 KB |

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|---|---|
| Aux Flash Memory | 24 KB |
| RAM | 28672 Bytes |
| DMA RAM | 4096 Bytes |
| EXTERNAL SRAM | 1 Mb |
| Clock Speed | 140 MHz (70Mips) |
| Lens Type | M12x0.5mm |
| Included Lens | 2.8mm f/2.0 |
| Others | Open source 3D case model<br>Real time clock<br>4 Programmable LEDs |