With the OSCAR,
Allied Vision Technologies presents a series of
digital multi-megapixel cameras – naturally of the Firewire class.

# Think Bigger!
# OSCAR –
# The Multi-Megapixel
# Camera Series.

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## The AVT OSCAR Series

**Go digital! It´s never been as simple before.**

Entry into digital image-processing has never been as simple and cost-effective as it is today. With the new OSCAR, Allied Vision Technologies presents a series of interesting, high-resolution digital cameras – naturally of the Firewire category.

The series consists of 3 different cameras, whose multi-megapixel resolutions, image pre-processing functions, framegrabber functions and robust industrial casings make them highly suited for a range of different applications. In this price class, the OSCAR sets new standards and offers convincing arguments for use in digital image-processing.

**Firewire – the new image processing standard**

Introduced to the computer industry by Apple as early as 1994, this digital connectivity technology has continued its triumph in the industrial image-processing field. The industry standard known as IEEE1394 (Firewire™ or I-Link™) enables simple computer compatibility and bi-directional data transfer via Plug&Play. The cost-cutting potential, high data rate of 400 Mbit/s, remarkable image quality and the easy integration with existing applications enabled by this technology is making Firewire cameras increa-

singly popular. The future is secure: the continued development of this standard with IEEE1394b and 800 Mbit/s has concluded and is now established in the image-processing field.

**The OSCAR family at a glance**

The AVT OSCAR family consists of three very compact IEEE1394 C-mount cameras, which are equipped with sensitive high-resolution, high quality sensors (CCD). Each of these cameras is available in color. Operating in 12-bit mode (16-bit in High SNR mode), these cameras convince with their outstanding image quality under almost all conditions. The OSCAR is equipped with an asynchronous trigger as well as true partial scan and integrates numerous smart features which are useful for image processing and microscopy. Three different resolutions of 3, 5 and 8 megapixels leave no wish unfulfilled and offer the right camera for all highly-detailed applications.

**The Architecture**

With the separation of the sensor and the motherboard, the OSCAR series offers the requirements for an "on demand" camera – there are virtually no limits as to "design in" and the adaptation to the relevant applications. The ARM 7 microcontroller and the large FPGA (Field Programmable Gate Array) ensure the fast execution

of all camera commands and thus make the outstanding performance of important functions possible - such as perfect shading correction or reliable white balance for example. The colour rendering and correction takes place in the large FPGA, which also takes over the entire realtime control of the camera. Additionally, the OSCAR offers up to 256MB of onboard memory to run a number of smart features such as image FIFO, LUT, color processing, shading correction and other functions in the camera itself.

**The Sensor**

The OSCAR camera series offers three different sensors which all distinguish themselves with the highest image quality at the highest resolutions. All variants are available in color versions. The highly-sensitive CCD-sensors significantly reduce undesired effects such as smear and blooming and offer image quality previously unheard of in this Firewire price class.

**Highlights:**

➤ Highest resolution
➤ Very good image quality
➤ Very good color
➤ Fast preview mode for live image (enables optimal object positioning and illumination)
➤ High SNR mode: master images with excellent image quality

**Capturing mode**

The Oscar provides special capturing modes for the most different applications. This means that moving images as well as stills can be captured comfortably under different lighting conditions.

| | OSCAR F-320C | OSCAR F-510C | OSCAR F-810C |
|---|---|---|---|
| Image Device | Sony ICX-262AQ, 1/1.8", 8.93mm | Sony ICX-282AQ, 2/3", 11mm | Sony ICX-456AQ, 2/3", 11.07mm |
| Effective Picture Elements | 2088 x 1548 | 2588 x 1958 | 3288 x 2470 |
| Cell Size | 3.45 µm x 3.45 µm | 3.4 µm x 3.4 µm | 2.7µm x 2.7 µm |
| Resolution Depth | 12bit / 16bit High SNR mode | 12bit / 16bit High SNR mode | 12bit / 16bit High SNR mode |
| Lens Mount | C-Mount | C-Mount | C-Mount |
| Color Modes | Raw, RGB, YUV 4:2:2 | Raw, RGB, YUV 4:2:2 | Raw, RGB, YUV 4:2:2 |
| Digital Interface | IEEE 1394a, IIDC 1.30 | IEEE 1394a, IIDC 1.30 | IEEE 1394a, IIDC 1.30 |
| Transfer Rate | 100Mbit/s, 200Mbit/s, 400Mbit/s | 100Mbit/s, 200Mbit/s, 400Mbit/s | 100Mbit/s, 200Mbit/s, 400Mbit/s |
| Frame Rates | 6.6 fps | 3.7 fps | 3.1 fps |
| Image Memory (FIFO) | 32MB ... 256MB | 32MB ... 256MB | 32MB ... 256MB |
| Gain Control | manual, 0...24dB, Auto Gain | manual, 0...24dB, Auto Gain | manual, 0...24dB, Auto Gain |
| Shutter Speed | 20µs ... 67s, Auto Shutter | 20µs ... 67s, Auto Shutter | 20µs ... 67s, Auto Shutter |
| External Trigger | Hardware and Software, asynchronous Variable Trigger Delay 1 shot, n images | Hardware and Software, asynchronous Variable Trigger Delay 1 shot, n images | Hardware and Software, asynchronous Variable Trigger Delay 1 shot, n images |
| Smart Features | Real Time ShadingCorrection Image FIFOs Gamma LUT 2 x input (programmable) 2 x output (programmable) | Real Time Shading Correction Image FIFOs Gamma LUT 2 x input (programmable) 2 x output (programmable) | Real Time Shading Correction Image FIFOs Gamma LUT 2 x input (programmable) 2 x output (programmable) |
| Power | DC 8V ... 36V via IEEE1394a cable | DC 8V ... 36V via IEEE1394a cable | DC 8V ... 36V via IEEE1394a cable |
| Power Consumption | 3.6 W | 3.6 W | 3.6 W |
| Dimensions | 44 mm x 44 mm x 65,9 mm | 44 mm x 44 mm x 65,9 mm | 44 mm x 44 mm x 65,9 mm |
| Mass | 170 g | 170 g | 170 g |
| Operating Temperature | + 5°C ... +45°C | + 5°C ... +45°C | + 5°C ... +45°C |
| Storage Temperature | -10°C ... +60°C | -10°C ... +60°C | -10°C ... +60°C |
| Regulations | EN 55022, EN61000, EN 55024, FCC Class A, ISO 9022 | EN 55022, EN61000, EN 55024, FCC Class A, ISO 9022 | EN 55022, EN61000, EN 55024, FCC Class A, ISO 9022 |
| Options | Host Adapter Card, API Fire Package, Direct FirePackage, Fire4Linux | Host Adapter Card, API Fire Package, Direct FirePackage, Fire4Linux | Host Adapter Card, API Fire Package, Direct FirePackage, Fire4Linux |

**Asynchronous external trigger**

The OSCAR is equipped with an asynchronous external trigger, which enables instant capturing without any significant latency time.

**Intelligent - by SmartFeatures**

The OSCAR takes over a number of useful image processing tasks on-the-fly with its built-in smart features, which puts less strain on a PC using a cached image processing.



**Image Memory - FIFO**

An OSCAR camera utilises up to 256MB of memory, enabling it to cache images at a maximum framerate and lessen strain on a PC during capturing and reduce the related waiting times. This smart camera can thus capture images while the PC is still processing the previous images.

### Programmable I/O

The OSCAR offers 2 programmable opto-coupled inputs and outputs. Apart from allowing a free-run start, the OSCAR offers a number of trigger possibilities to precisely record complex events and applications - such as the monitoring and control of external mechanical parts, the switching of different light sources (e.g flash trigger) and the status monitoring of the camera itself.

### Beautiful -
### by Image Preprocessing

To optically optimise an image without putting strain on a computer's CPU, the OSCAR offers a number of image pre-processing functions (image processing). This enables simple and error free evaluations.

### High SNR Mode

The OSCAR offers the new High SNR Mode for the highest image quality requirements. In this mode, details which reach the limits of physical possibility can be revealed (SNR by factor 16 = 24db). This process is based on methods used in space research.

### Realtime Shading Correction

A further smart feature of all members of the OSCAR family is Realtime Shading Correction, which can bring any pixel to a normal level via a correction matrix — to compensate for local lighting or lense errors for example.

### Intelligentes Color-Processing

The color versions of the OSCAR series have an extremely good and balanced colour display as a result of a well thought out color correction matrix. The OSCAR takes care of the Bayer Demosaicing and the color conversion from RGB to YUV in the FPGA. The color display thus becomes more natural and single tones can be displayed or distinguished better.

### Lookup Table

The internal memory of the OSCAR contains an integrated lookup table (LUT), can be activated and configured at will. The LUT can be created with a PC (e.g. with a standard program such as Excel™) and then be easily loaded into the camera.

### Software

Image processing with the OSCAR follows the Plug&Play principle: the software packages by Allied Vision Technologies are prepared for different fields of use. Whether for high-performance applications with full bus control **(AVT FirePackage)**, for comfortable integration under WDM, Direct X and TWAIN/WIA **(AVT DirectFire Package)** or as a complete installation in the Linux environment **(AVT Fire4Linux)**, Allied Vision Technologies offers everything that makes image processing simpler. Additionally, AVT cameras are compatible with all standard image processing libraries such as National Instruments Labview, MVTec, Halcon, MVTec Active Vision Tools, Stemmer Imaging Common Vision Blox , Neurocheck and Matrox Inspector — which support the Firewire standard.

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