Think Bigger!
OSCAR –
The multi-megapixel camera series.

///ALLIED
Vision Technologies

AVT Oscar multi-megapixel camera series

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 Oscar, Allied Vision Technologies presents a series of interesting, high-resolution digital cameras-naturally of the FireWire category.

The series consists of three different cameras, whose multi-megapixel resolutions, image pre-processing functions, frame grabber functions and robust industrial housings 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 IEEE 1394 (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 increasingly popular. The future is secure: the continued development of this standard with IEEE 1394b 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 IEEE 1394 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, 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 mainboard, 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 color 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 128 MB 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 high image quality at the high 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:

- High resolution
- Very good image quality
- Very good color
- Digital still sensors
- 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.

Asynchronous external trigger.

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

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	Oscar F-320C	Oscar F-510C	Oscar F-810C
Image device	Type 1/1.8 (diag. 8.93 mm), Sony CCD frame readout ICX-262AQ	Type 2/3 (diag. 11 mm), Sony CCD frame redout ICX-282AQ	Type 2/3 (diag. 11.07 mm), Sony CCD frame redout ICX-456AQ
Picture size	2080 (H) x 1540 (V)	2588 (H) x 1958 (V)	3272 (H) x 2469 (V)
Cell size	3.45 µm x 3.45 µm	3.4 µm x 3.4 µm	2.7 µm x 2.7 µm
Resolution depth	12-bit / up to 16-bit in High SNR mode	12-bit / up to 16-bit in High SNR mode	12-bit / up to 16-bit in High SNR mode
Lens mount	C-Mount	C-Mount	C-Mount
Color modes	Mono8, Y8-green, Y8-red, Y8-blue, Raw8/16, RGB8, YUV 4:2:2, YUV 4:1:1	Mono8, Y8-green, Y8-red, Y8-blue, Raw8/16, RGB8, YUV 4:2:2, YUV 4:1:1	Mono8, Y8-green, Y8-red, Y8-blue, Raw8/16, RGB8, YUV 4:2:2, YUV 4:1:1
Digital interface	IEEE 1394a, IIDC V1.3	IEEE 1394a, IIDC V1.3	IEEE 1394a, IIDC V1.3
Transfer rate	100Mbit/s, 200Mbit/s, 400Mbit/s	100Mbit/s, 200Mbit/s, 400Mbit/s	100Mbit/s, 200Mbit/s, 400Mbit/s
Frame rates	Up to 6.6 fps	Up to 3.7 fps	Up to 3.1 fps
Image memory (FIFO)	32 MB ... 128 MB	32 MB ... 128 MB	32 MB ... 128 MB
Gain control	Manual, 0...20 dB, auto gain	Manual, 0...20 dB, auto gain	Manual, 0...20 dB, auto gain
Shutter speed	20 µs ... 67s, auto shutter (select. AOI)	20 µs ... 67s, auto shutter (select. AOI)	20 µs ... 67s, auto shutter (select. AOI)
External trigger	Hardware and software, asynchronous variable trigger delay, one-shot, multi-shot	Hardware and software, asynchronous variable trigger delay, one-shot, multi-shot	Hardware and software, asynchronous variable trigger delay, one-shot, multi-shot
Smart features	Real-time shading correction, color correction, High SNR-mode (image summation); 2 config. inputs, 2 config. outputs, image mirror (L-R<->R-L), sub-sampling, user profiles, serial port (IIDC V1.31)	Real-time shading correction, color correction, High SNR-mode (image summation); 2 config. inputs, 2 config. outputs, image mirror (L-R<->R-L), sub-sampling, binning, user profiles, serial port (IIDC V1.31)	Real-time shading correction, color correction, High SNR-mode (image summation); 2 config. inputs, 2 config. outputs, image mirror (L-R<->R-L), sub-sampling, user profiles, serial port (IIDC V1.31)
Power requirements	DC 8V ... 36V via IEEE 1394a cable or 12-pin HIROSE	DC 8V ... 36V via IEEE 1394a cable or 12-pin HIROSE	DC 8V ... 36V via IEEE 1394a cable or 12-pin HIROSE
Power consumption	3.6 watt (@12 V DC)	3.6 watt (@12 V DC)	3.6 watt (@12 V DC)
Dimensions	72,5 mm x 44 mm x 44 mm (L x W x H); w/o tripod and lens	72,5 mm x 44 mm x 44 mm (L x W x H); w/o tripod and lens	72,5 mm x 44 mm x 44 mm (L x W x H); w/o tripod and lens
Mass	170 g (without lens)	170 g (without lens)	170 g (without lens)
Operating temperature	+ 5°C ... +45°Celsius (without condensation)	+ 5°C ... +45°Celsius (without condensation)	+ 5°C ... +45°Celsius (without condensation)
Storage temperature	-10°C ... +60°Celsius (without condensation)	-10°C ... +60°Celsius (without condensation)	-10°C ... +60°Celsius (without condensation)
Regulations	CE, FCC Class B, RoHS (2002/95/EC)	CE, FCC Class B, RoHS (2002/95/EC)	CE, FCC Class B, RoHS (2002/95/EC)
Options	Removable IR cut filter, host adapter card, locking IEEE 1394 cable, AVT FirePackage / Active FirePackage / Fire4Linux	Removable IR cut filter, host adapter card, locking IEEE 1394 cable, AVT FirePackage / Active FirePackage / Fire4Linux	Removable IR cut filter, host adapter card, locking IEEE 1394 cable, AVT FirePackage / Active FirePackage / Fire4Linux

Intelligent - by smart features.

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 utilizes up to 128 MB of memory, enabling it to cache images at a maximum frame rate 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.

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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 pre-processing.

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. This process is based on methods used in space research.

Real-time shading correction.

A further smart feature of all members of the Oscar family is real-time 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.

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Intelligent 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 and distinguished better.

Look-up table.

The internal memory of the Oscar contains an integrated look-up 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 Active Fire Package)** or as a complete installation in the Linux environment, Allied Vision Technologies offers everything that makes image processing simpler.
Additonally, 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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