



Always a new perspective.

IEEE1394 DIGITAL CCD AND CMOS CAMERA LINE



FOculus – ALWAYS A NEW PERSPECTIVE

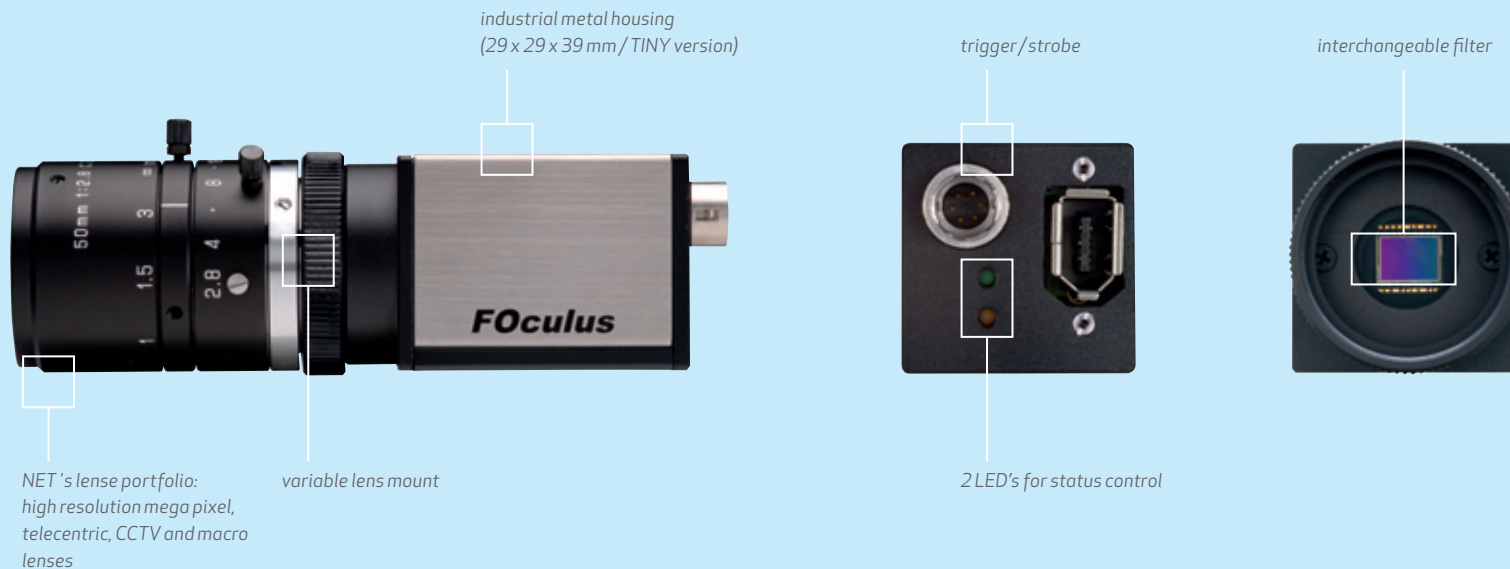
FOculus – NET's first vision development.

FOculus IEEE1394 SERIES

FOculus – a camera line with CCD and CMOS image sensors equipped with the standardized interface IEEE1394, also called FireWire that is well established in image processing applications. The camera FOculus is dedicated for integration in industrial applications, medical imaging,

biometrics and many others due to several main advantages. The portfolio covers a wide range of existing well accepted image sensors to match the best fit for your application without any cut back. FOculus is equipped with a C-/CS-mount to allow a free selection of lenses.

Two different housings – tiny and small version – support the cameras that come in monochrome and color version.

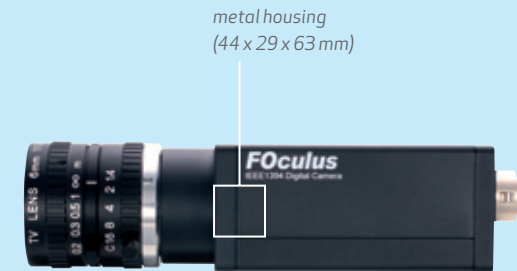


TECHNICAL DATA – SMALL SERIES WITH CCD IMAGE SENSOR

FOculus SMALL VERSION

The size of a camera varies with the image sensor that is used. A large single pixel combined with high resolution being sensitive in the near IR- wavelength can be selected from the Small series. It combines all benefits of the FOculus product family and is designed for a harsh environment. Therefore all connectors can be secured that even

the highest vibration will not have any influence to the application. The large selection of the FOculus family is used in a wide field of image processing applications and shows NET's expertise and knowledge of applications and ability to offer solutions in a standard design or as a customized version.



SMALL VERSION	F01245B	F01245C	F01345B	F01345C	F02345B	F02345C	F03235B	F03235C	F04325B	F04325C	F04425B	F04425C	F05315B	F05315C
Resolution(HxV)[px]	659 x 494 /VGA		659 x 494 /VGA		782 x 582 /CCIR		1034 x 779 /XGA		1392 x 1040 /SXGA		1392 x 1040 /SXGA		1628 x 1236 /UXGA	
Sensor	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD
Image sensor	ICX424AL/AQ		ICX414AL/AQ		ICX415AL/AQ		ICX204AL/AK		ICX205AL/AK		ICX285AL/AQ		ICX274AL/AQ	
Sensor size	1/3"		1/2"		1/2"		1/3"		1/2"		2/3"		1/1.8"	
Pixel size [µm]	7.40 x 7.40		9.90 x 9.90		8.30 x 8.30		4.65 x 4.65		4.65 x 4.65		6.45 x 6.45		4.40 x 4.40	
Frame rate [fps]	60 /86 (format7)		60 /86 (format7)		60 /63 (format7)		30 /36 (format7)		15 /20 (format7)		15 /20 (format7)		15 /16 (format7)	
Shutter speed	1 µs - 3600 s /auto shutter													
Data path	8 or 12 bit BW / RawRGB + YUV422													
Binning	pixel binning b/w & F0531TC													
Format 7	partial scan 4 x 4 units													
Trigger	external / software													
Strobe	normal / trigger													
Gain [dB]	0 - 25										0 - 27		0 - 25	
Lens	C-mount													
Scanning system	progressive scan													
Advanced features	one shot & multi shot; multi camera auto sync; opto-isolated I/O; industrial lock screw support													
SIO (RS-232)	Path through or NET command													
S / N ratio [dB]	> 56													
Interface	IEEE1394.a 1port (6pin) / 400Mbps													
Operating temperature	-5 to +45° C													
Dimension (WxHxD) [mm]	44 x 29 x 63										44 x 29 x 67		44 x 29 x 63	
Power consumption [W]	3													
Camera specification	IIDC 1394-based digital camera specification v1.31													

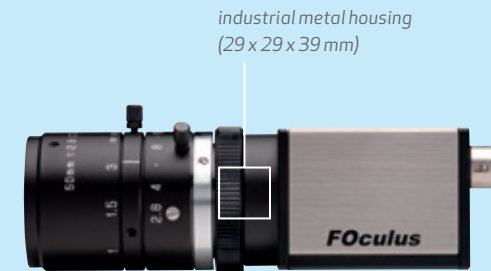
TECHNICAL DATA – TINY SERIES WITH CMOS IMAGE SENSOR

TINY CMOS

The housing of the TINY model is equipped with CCD and CMOS image sensors.

TINY is the package – performance is outstanding. Capturing images in real-time and having control of each frame based on the IEEE1394 interface is important to control the application during high frame rates.

A benefit of using a CMOS sensor like in the FOculus TINY allows a direct addressing of a free selectable region of interest (ROI) to capture the segment that counts with the result to increase the frame rate of the camera. Furthermore does the CMOS version offer a high signal to noise ratio for a homogenous and uniform image quality.



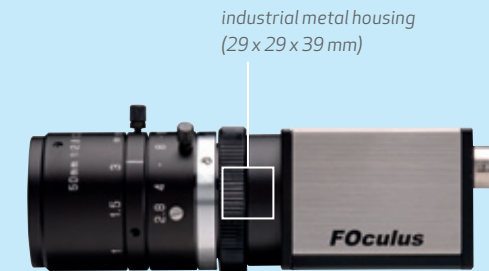
TINY CMOS	FO1224TB	FO1224TC	FO1433TB	FO1631TC
Resolution(HxV) [px]	752 x 480 / WVGA	752 x 480 / WVGA	1280 x 1024 / SXGA	2048 x 1536 / QXGA
Sensor	CMOS	CMOS	CMOS	CMOS
Image sensor	MT9V022177ATM	MT9V022177ATC	MT9M001	MT9T031
Sensor size	1/3"	1/3"	1/2"	1/2"
Pixel size [µm]	6.00 x 6.00	6.00 x 6.00	5.20 x 5.20	3.20 x 3.20
Frame rate [fps]	60	60	24	10
Shutter	global	global	rolling	rolling
Shutter speed	93 µs - 100 ms	93 µs - 100 ms	60 µs - 500 ms	63 µs - 1 s
Data path	8 or 10 bit	8 or 10bit BW / RawRGB + YUV422	8 or 10 bit	8 or 10bit BW / RawRGB + YUV422
Binning	2 x 2	-	-	2 x 2
Format 7	partial scan 4 x 4 units			
Trigger	external / software			
Strobe	normal / trigger			
Gain [dB]	0 - 12	0 - 12	6 - 18	0 - 63
Lens	C / CS-mount			
Scanning system	progressive scan			
Control function	brightness, sharpness, gamma, pan/tilt	brightness, sharpness, gamma, pan/tilt, U/B, V/R, Hue/G, white balance	brightness, sharpness, gamma, pan/tilt	brightness, sharpness, gamma, pan/tilt, U/B, V/R, Hue/G, white balance
Memory save / load	16 channels			
SIO (RS-232)	path through or NET command			
S/N ratio [dB]	45	45	45	43
Interface	IEEE1394.a 1port (6pin) / 400Mbps			
Operating temperature	-5° to +45° C			
Dimension (WxHxD) [mm]	29 x 29 x 39			
Power consumption [W]	< 2			
Camera specification	IIDC 1394-based digital camera specification			

TECHNICAL DATA – TINY SERIES WITH CCD IMAGE SENSOR

TINY CCD

FOculus products cover extreme applications: ultra short (e.g. high speed application) or long exposure time settings (e.g. increasing the excitation level) are particular benefits of the CCD based cameras. The standard communication protocol implemented in the FOculus supports high data rates to transfer

e.g. high resolution images quickly, handling of multi camera applications or just to change between different FOculus models by simply plug & play.



TINY CCD	F0124TB	F0124TC	F0134TB	F0134TC	F0323TB	F0323TC	F0432TB	F0432TC	F0531TB	F0531TC
Resolution (H x V) [px]	659 x 494 / VGA		659 x 494 / VGA		1034 x 779 / XGA		1388 x 1040 / SXGA		1638 x 1236 / UXGA	
Sensor	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD	CCD
Image sensor	ICX424AL/AQ		ICX414AL/AQ		ICX204AL/AK		ICX267AL/AQ		ICX274AL/AQ	
Sensor size	1/3"		1/2"		1/3"		1/2"		1/1.8"	
Pixel size [µm]	740 x 740		9.90 x 9.90		4.65 x 4.65		4.65 x 4.65		4.40 x 4.40	
Frame rate [fps]	60 / 88 (format7)		60 / 86 (format7)		30 / 36 (format7)		15 / 20 (format7)		15 / 16 (format7)	
Shutter speed	1 µs - 3600 s / auto shutter									
Data path	8 or 12 bit BW / Raw RGB + YUV422									
Binning	pixel binning B/W & F0531TC									
Format 7	partial scan 4 x 4 units									
Trigger	external / software									
Strobe	normal / trigger									
Gain [dB]	0 - 25				0 - 27		0 - 25		0 - 27	
Lens	C- / CS-mount									
Scanning system	progressive scan									
Control function	one shot & multi shot; multi camera auto sync; high speed up trigger framerate, LUT, frame save									
SIO (RS-232)	path through or NET command									
S / N ratio [dB]	> 56									
Interface	IEEE1394.a 1port (6pin) / 400Mbps									
Operating temperature	-5° to +45° C									
Dimension (WxHxD) [mm]	29 x 29 x 39									
Power consumption [W]	3									
Camera specification	IIDC 1394-based digital camera specification v1.31									

APPLICATION & SOFTWARE

Ask us for matching lenses & illumination!

APPLICATION OVERVIEW

FOculus cameras are designed for industrial applications such as machine vision and factory automation.

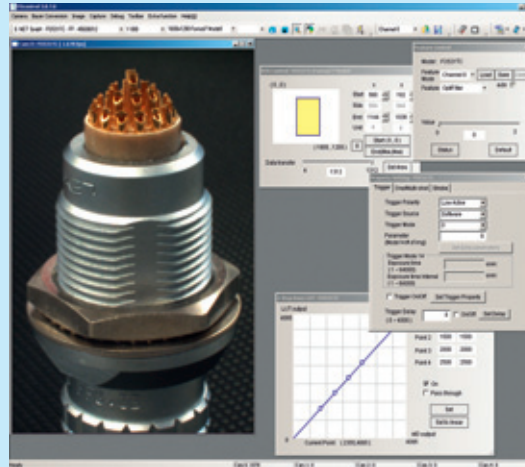
The quality inspection i.e. bonder-, wafer- and die-inspection require a camera to be light weighted and high in frame rate, positioning/alignment can just be done with a precisely assembled camera, completeness-, surface- and printing inspection count on color reproduction, identification, bar code et al. should use a FOculus – Tiny or Small – camera.

HIGHLIGHTS

- IEEE1394 (IIDC) standard interface with a high level of data integrity
- Wide range of high sensitive CCD and CMOS image sensors
- Scalable and selectable ROI, advanced features
- Powerful Software Development Kit and viewer software for all cameras

SOFTWARE DEVELOPMENT KIT (SDK)

The integration of FOculus is supported through a wide variety of common drivers and allows the easy function of plug-and-play. The powerful software package from NET – viewer application and SDK – makes the integration into existing and fully customized image processing systems simple.



The flexible structured SDK supports individual applications requirements easy and user friendly. The FOculus family is compatible to software libraries like MVTec Halcon & Active Vision Tools, National Instruments LabView, Cognex Vision Pro and Matrox's MIL & MIL-Lite.

NO CABLE LENGTH LIMITATION FOR FOCULUS

The IEEE1394 interface specifies a limited cable length of 4.5 meter. NET's optical repeater FO800R solution covers a distance of up to 1.000 meter between FOculus and PC. The FO800R works as easy as the plug and play principle. The data communication speed reaches 800/400Mbps depending on the IEEE1394 a./b. standard.



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