



Genie™ Nano Cameras

Smaller, faster, stronger, cheaper.

최상의 속도와 이미지 품질을 제공하는 초소형 GigE Vision Camera

Genie Nano는 Teledyne DALSA 제품군 중 가장 저렴하고 강력한 성능을 가진 CMOS Area Scan 카메라로 GigE vision, CameraLink 두 가지의 인터페이스를 지원합니다. Genie Nano는 업계 선도적인 CMOS 센서를 장착하였으며, 더불어 독자적인 카메라 기술을 통한 혁신적인 스피드, 혹독한 환경을 대비한 강건한 바디 설계, 그리고 가격 대비 그 이상의 다양한 기능을 제공합니다.

Teledyne DALSA의 특허인 TurboDrive™ 기술은 Genie Nano가 최상의 이미지 품질을 유지함과 동시에, GigE 카메라의 한계보다 150% 또는 그 이상의 높은 프레임 속도를 가능케 합니다. 모든 Teledyne DALSA의 GigE 카메라와 마찬가지로, Genie Nano는 AIA GigE Vision 표준을 기반으로 카메라를 PC로 직접 연결할 수 있습니다.



TURBODRIVE BY TELEDYNE DALSA

GigE
VISION

주요 특징

- 표준 PC의 이더넷 포트와 하드웨어 사용
- 최대 100m 케이블 길이 지원 (CAT-5e 또는 CAT-6)

품질 보증

- CE, FCC 및 RoHS

프로그램 가능성

- Partial 스캔 모드에서 더욱 빠른 프레임 속도
- 노출제어 기능을 탑재한 글로벌 셔터
- 다중 노출 가능
- 멀티 ROI 가능(최대16 ROI)
- MetaData 지원
- IEEE1588 (네트워크 간 정확한 동기화 가능) 지원
- Binning
- Look-up table

안정성

- 내구성을 고려한 강건한 바디 설계
- 3년의 보증기간
- 이미지 신뢰성 진단(Trigger to Image-Reliability) 프레임워크를 활용해 전송된 이미지에 대해 완벽한 시스템 수준의 모니터링과 제어, 진단 가능

대표 어플리케이션

- 전자 제품 제조 검사
- 산업용 계측
- ITS(지능형 교통 시스템)
- 스포츠 시뮬레이션
- 의료기기

Specifications: M4060

Supported Features	M4060	
Resolution	4112 x 2176	
Sensor	Sony IMX255 (8.9M)	
Pixel Size	3.45 μm x 3.45 μm	
Shutter type	Full frame electronic global shutter function	
Firmware option (Field programmable)	High Sensitivity Design Firmware	Standard Design Firmware
Full Well charge; dependent on Firmware Design Loaded	2750e ⁻ (max)	11ke (max)
Sensitivity to Saturation	4x	1x
Max. Internal Frame Rate Full resolution	56 fps	46 fps
Maximum Sustained Frame Rate Output (with TurboDrive v1) *	28 fps (8-bit)	
Maximum Sustained Frame Rate Output (without TurboDrive)	13 fps (8-bit)	
Pixel Data Formats	Mono 8-bit	
Trigger to Exposure Minimum delay (Synchronous Exposure Alignment)	2 line time (15.8 μs)	2 line time (19.5 μs)
Trigger to Exposure Minimum delay (Reset Exposure Alignment)	0 μs	
Trigger to Exposure Start jitter (best case with Synchronous Exposure Alignment)	Max 1 line 0 to 7.89 μs	Max 1 line 0 to 9.72 μs
Trigger to Exposure Start jitter (Reset Exposure Alignment)	0 μs	
Actual Exposure Time Minimum (see "exposureTimeActual" in Sensor Control)	22 μs (1 line time + 14.26 μs) (increment of 7.89 μs steps)	24 μs (1 line time + 14.26 μs) (increment of 9.72 μs steps)
Min. Time from End of Exposure to Start of Next Exposure	16 lines – 14.26 μs (112 μs)	16 lines – 14.26 μs (141.3 μs)
Horizontal Line Time: Normal operation (with In-Sensor Binning enable)	7.89 μs (4.95 μs)	9.72 μs (5.27 μs)
Readout Time	(H Line Time) x (lines in frame + 39) in μs	
Auto-Brightness	Yes , with Auto-Exposure and AGC (FPGA Gain or Sensor Gain)	
Black offset control	Yes (in DN)	
Gain Control	In-sensor Analog Gain (1.0x to 251x)	
Binning Support	Yes, In-sensor 2x2 (averaging) Yes In-FPGA (summing and average, 2x2, 4x4)	
Decimation Support	No	
Defective Pixel Replacement	Yes , up to 512 pixel position	
Image Correction	no	
Image Flip Support	Yes, In-Sensor, Vertical and Horizontal	
Multi-ROI Support	Yes, In-Sensor, up to 16 ROI (mutually exclusive with in-sensor binning)	
On-Board Image Memory	220MB	
Output Dynamic Range (dB)	56.43	76.46 dB (in 8-Bit Pixel Format)
SNR (dB)	33.01	39.38 dB (in 8-Bit Pixel Format)

* Limited to the Genie Nano Architecture:

~250MB/sec Sustained into the TurboDrive Engine achieved using 1500 Byte Packet Size

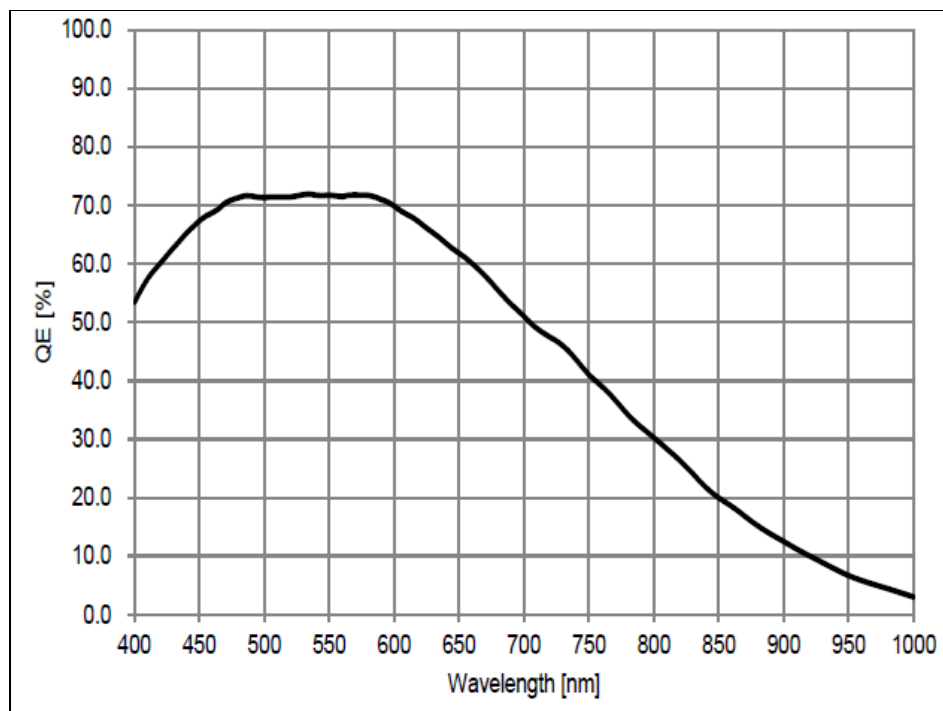
Specifications: C4060

Supported Feature	C4060		
Resolution	4112 x 2176		
Sensor	Sony IMX255 (8.9M)		
Pixel Size	3.45 μm x 3.45 μm		
Shutter type	Full frame electronic global shutter function		
Firmware option (Field programmable)	High Sensitivity Design (Bayer)	Standard Design (Bayer)	RGB-Output Design
Full Well charge; dependent on Firmware Design Loaded	2750e- (max)	11ke (max)	
Sensitivity to Saturation	4x	1x	
Max. Internal Frame Rate Full resolution	56 fps	46 fps	
Maximum Sustained Frame Rate Output (with TurboDrive v1)*	28 fps (8-bit)		N/A
Maximum Sustained Frame Rate Output (without TurboDrive)	13 fps (8-bit)		3.2fps (RGBA) 4.3 fps (RGB) 6.5 fps (Yuv422) 13 fps (mono8)
Pixel Data Formats	Bayer 8-Bit	Bayer 8-Bit	RGBA 32-bit RGB 24-bit Yuv422 16-bit Mono 8-bit
Trigger to Exposure Minimum delay (Synchronous Exposure Alignment)	2 line time (15.8μs)	2 line time (19.5μs)	
Trigger to Exposure Minimum delay (Reset Exposure Alignment)	0 μs		
Trigger to Exposure Start jitter (best case with Synchronous Exposure Alignment)	Max 1 line 0 to 7.89μs	Max 1 line 0 to 9.72μs	
Trigger to Exposure Start jitter (Reset Exposure Alignment)	0 μs		
Actual Exposure Time Minimum (see “exposureTimeActual” in Sensor Control)	22μs (1 line time + 14.26 us) (in 7.89μs steps)	24μs (1 line time + 14.26 us) (in 9.72μs steps)	
Min. Time from End of Exposure to Start of Next Exposure	16 lines –14.26μs (112μs)	16 lines – 14.26μs (141.3μs)	
Horizontal Line Time: Normal operation (with In-Sensor Binning enable)	7.89μs (4.95μs)	9.72μs (5.27μs)	
Readout Time	(H Line Time) x (lines in frame +39) in μs		
Auto-Brightness	Yes , with Auto-Exposure and AGC (FPGA Gain or Sensor Gain)		
Black offset control	Yes (in DN)		
Gain Control	In-sensor Analog Gain (1.0x to 251x)		
Binning Support	No		
Color Correction Support	No		Yes
Decimation Support	No		
Defective Pixel Replacement	Yes , up to 512 pixel position		
Image Correction	no		
Image Flip Support	Yes, In-Sensor, Vertical and Horizontal		
Multi-ROI Support	Yes, In-Sensor, up to 16 ROI (mutually exclusive with in-sensor binning)		
On-Board Image Memory	220MB		
Output Dynamic Range (dB)	56.43	76.46 dB (in 8-Bit Pixel Format)	
SNR (dB)	33.01	39.38 dB (in 8-Bit Pixel Format)	

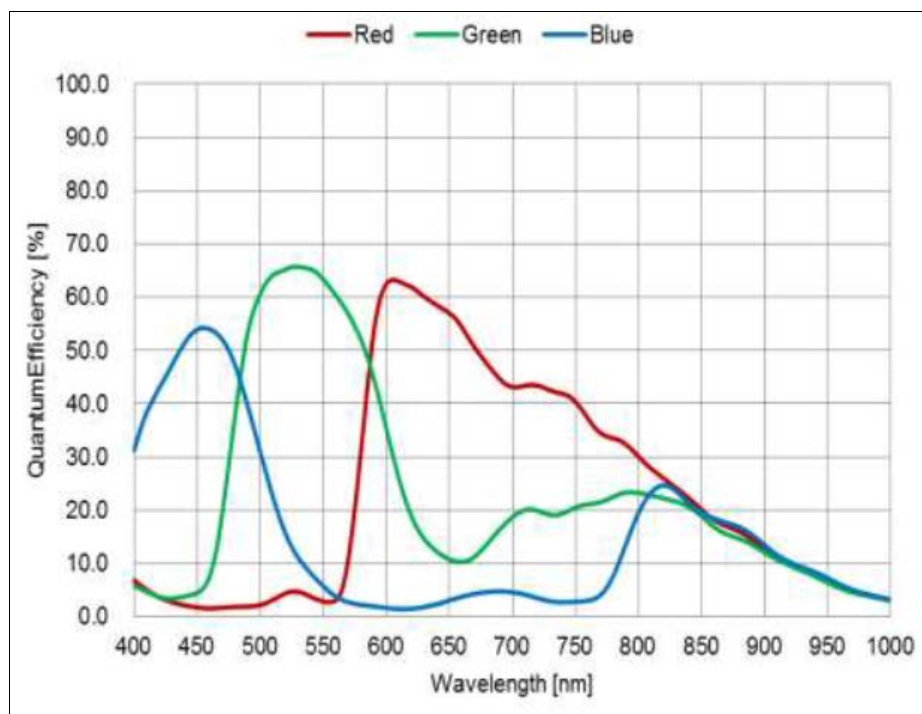
Spectral Responses 4060 & 4040

The response curves describe the sensor, excluding lens and light source characteristics.

Models M4060, M4040



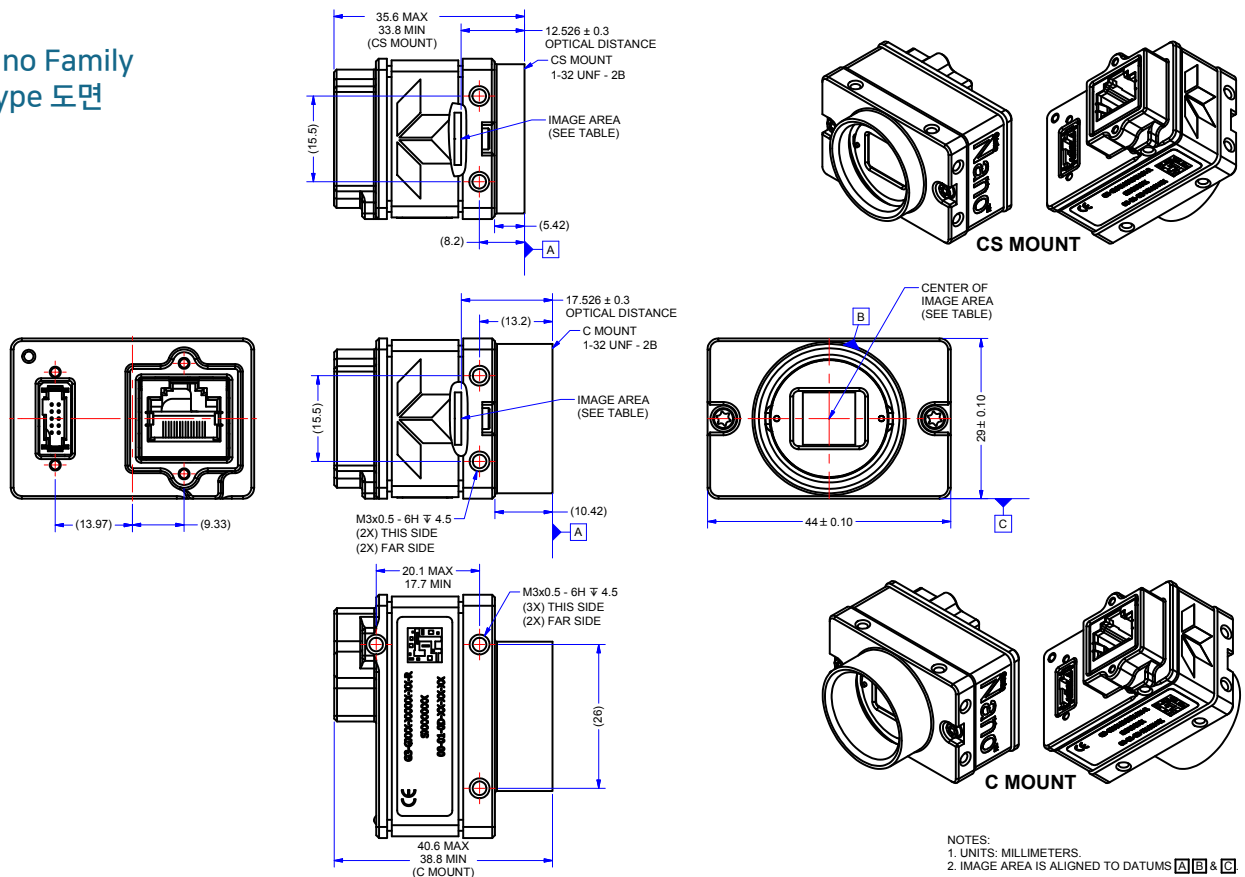
Models C4060, C4040



Genie Nano Family - GigE Type 상세 스펙

GENIE NANO		GENIE NANO XL
Data Output Transfer	Gigabit Ethernet (1000 Mbit/s) only	
Exposure Control	Automatic, programmable, or via external trigger (Note: C4900 rolling shutter supports only programmable exposure control)	
I/O Ports	2 opto-isolated inputs, 2 opto-isolated outputs, 1 input/3 outputs option available on demand	2 opto-isolated inputs, 3 opto-isolated outputs
Image Buffers (On-board memory)	90MB for VGA to 5 Mpixel models 200 MB for the 9M, 12M and 18 Mpixels models	500 MB for the 16 and 25 Mpixels models
Lens Mount	C and CS-Mount available	M42
Size (L x H x W) (C-mount option)	21.2 mm x 29 mm x 44 mm (no lens adapter or connectors) 38.9 mm x 29 mm x 44 mm (with lens adapter and connectors)	30 mm x 59 mm x 59 mm (no lens adapter or connectors) 30 mm x 59 mm x 59 mm (with lens adapter and connectors)
Mass	~46 g	~163 g
Operating Temp	-20 to +60°C (housing temperature)	
Power Supply	10 to 36V or Power Over Ethernet (POE)	
Power Dissipation (model dependent)	3.6 W to 4.6 W (12V) 4.0 W to 4.9 W (PoE)	6.5 W @ 24 Volt Aux.
Data Connector	Standard or screw mount RJ-45	
Power and I/O Connector	SAMTEC TFM-105 type	
Camera Specification	GigE Vision v1.2 compliant	
Software Platform	Teledyne DALSA Sopera LT 8.0 for Windows, Teledyne DALSA GigE-V for Linux or 3rd Party GenICam compliant SDK	

Genie Nano Family - GigE Type 도면



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