



Genie™ Nano-CL Cameras

Smaller, faster, stronger, cheaper.

최상의 속도와 이미지 품질을 제공하는 초소형 Camera Link Camera

Genie Nano-CL은 Teledyne DALSA 제품군 중 가장 저렴하고 강력한 성능을 가진 Camera Link CMOS Area Scan 카메라입니다. Genie Nano는 업계 선도적인 CMOS 센서를 장착하였으며, 신뢰성 있는 카메라 기술을 통한 혁신적인 스피드, 혹독한 환경을 대비한 강건한 바디를 가졌습니다. 그리고 이 모든 것을 저렴한 가격에 제공합니다.



주요 특징

- SDR 커넥터 방식
- GenIcam GenCP 호환
- 현장에서 입증된 CamExpert 기반인 Sopera LT 소프트웨어로 간단한 설정
- 내구성이 강한 스크루 마운트 RJ-45 커넥터로 산업환경을 고려한 설계

품질 보증

- CE, FCC 및 RoHS, GenIcam, IP30, Camera Link 2.01

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

대표 어플리케이션

- 반도체 웨이퍼 검사
 - surface, bump 검사
- 전자제품 제조
 - 3D SPI 검사
 - 포장 및 bump 검사
 - Automated Optical Inspection
- 태양광 패널 검사
- Aerial Imaging

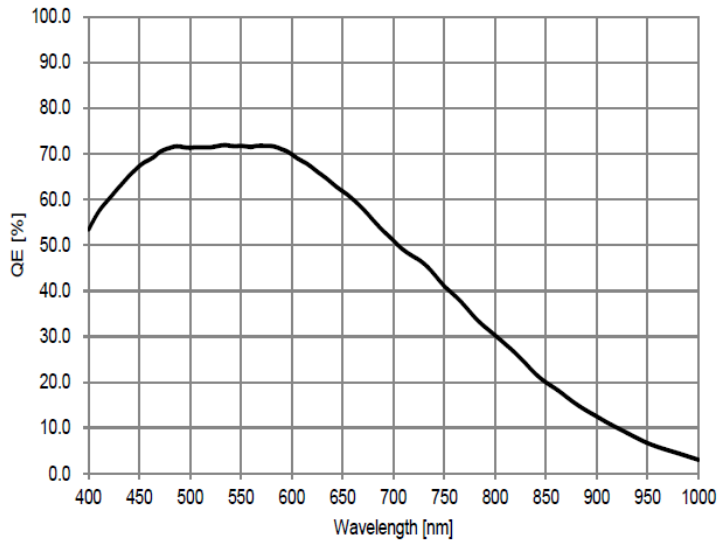
Nano-CL Specifications: M4060 & C4060

Model specific specifications and response graphics for the M/C4060 series are provided here. The response curves describe the sensor, excluding lens and light source characteristics.

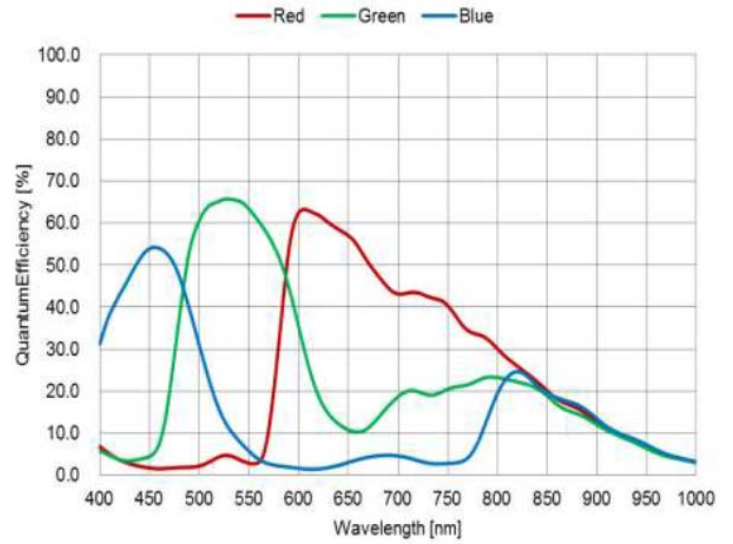
Supported Features	M4060 & C4060	
Resolution	4112 x 2176	
Sensor	Sony IMX255 (8.9M)	
Pixel Size	3.45 μm x 3.45 μm	
Shutter Type	Full frame electronic global shutter function	
Full Well charge	11ke (max)	
Sensitivity to Saturation	4x	
Firmware options (field programmable)	Standard Design Full 6-Taps Firmware	High Speed Design 80-bits-10Taps Firmware
Maximum Frame Rate (full frame)	TBD	87.6 fps
Pixel Format (Mono) 	Mono 8 & 12 bit	Mono 8 bit
Pixel Format (Color) 	Bayer 8 & 12 bit	Bayer 8 bit
Trigger to Exposure Minimum delay (<i>Synchronous Exposure</i>)	2 Line Time — 10.22 μs	
Trigger to Exposure Minimum delay (<i>Reset Exposure</i>)	0.05 μs	
Trigger to Exposure Start jitter (<i>Synchronous Exposure</i>)	0 to 5.11 μs (i.e. up to 1 line time)	
Trigger to Exposure Start jitter (<i>Reset Exposure</i>)	0 μs	
Exposure Time Minimum (see “exposureTimeActual” in Sensor Control)	5.11 + 14.26 = 19.37 μs	
Horizontal Line Time:	5.11 μs	
Min. Time from End of Exposure to Start of Next Exposure	TBA	108 μs
Readout Time	1 Line Time*(number of lines + 28)	
Auto-Brightness	No	
Black offset control	Yes (in DN)	
Gain Control	In-sensor Analog Gain (1.0x to 251x) Digital Gain (1x to 4x in 0.1 steps)	
Binning Support	No	
Decimation Support	No	
Defective Pixel Replacement	Yes	
Image Correction	No	
Image Flip support	No	
Multi-ROI Support	No	
Output Dynamic Range (dB)	76.4 dB	
SNR (dB)	39.3 dB	

- 감도 그래프

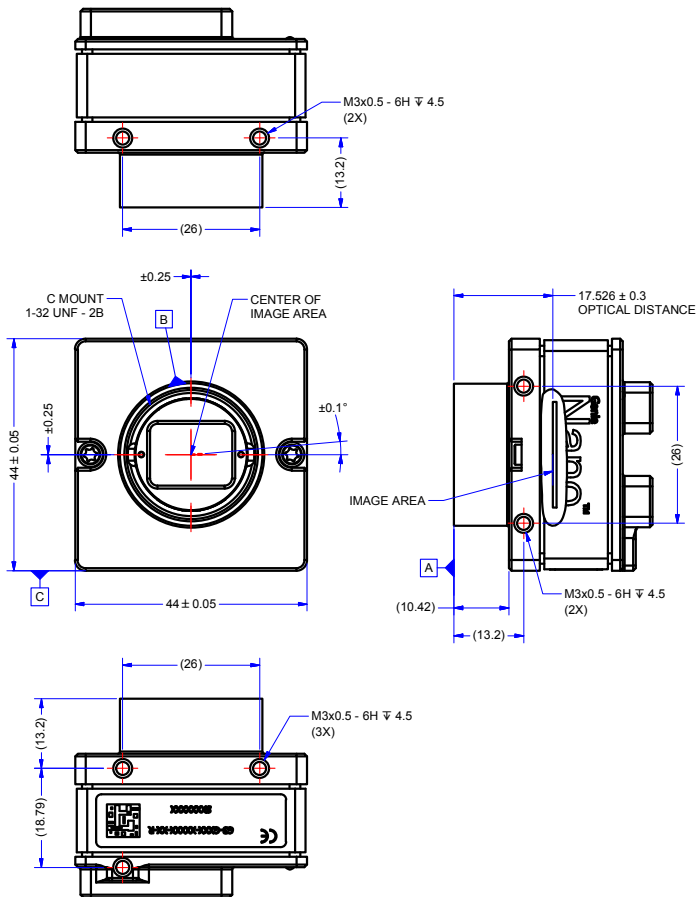
Model M4060



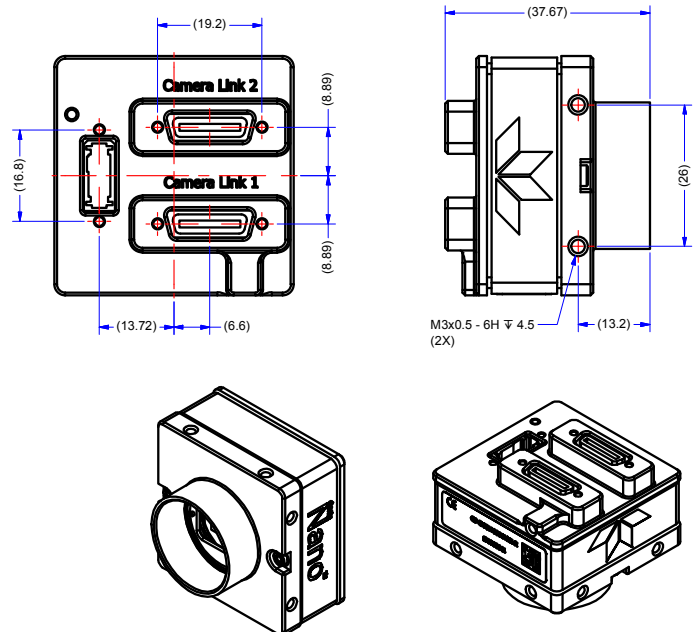
Model C4060



- 도면 : 5.1M & 12M 제품



NOTES:
1. UNITS: MILLIMETERS.
2. IMAGE AREA IS ALIGNED TO DATUMS A & C



- Genie Nano CL Series 상세 스펙

GENIE NANO CL (Medium Casing)		GENIE NANO CL (XL Casing)
Data Output Transfer		CameraLink (Deca Mode) 10-taps or (Base) 2 / 3-taps @ 85 Mhz configuration (model depended)
Exposure Control		Automatic, programmable, or via external trigger
I/O Ports	2 opto-isolated inputs, 2 opto-isolated outputs, 2 Camera Link CC lines (Camera Control)	2 Camera Link CC lines (Camera Control)
Lens Mount	C-Mount available	M42
Size (L x H x W) (C-mount option)	44 mm x 44 mm x 21 mm (without bar adapter and connectors) 44 mm x 44 mm x 39 mm (with lens adapter and connectors)	30 mm x 59 mm x 59 mm (no lens adapter or connectors)
Mass	~72 g	~163 g
Operating Temp		-20 to +60° C (housing temperature)
Power Supply		+10 to +30 V or Power Camera Link (PoCL)
Power Dissipation (model dependent)	6.5 W @ 24 Volt Aux.	6.5 W @ 24 Volt Aux.
Data Connector		For CameraLink Deca mode
Power and I/O Connector		SAMTEC TFM-105 type
Camera Specification		Camera Link v2.1, GeniCam GenCP compliant
Software Platform		Teledyne DALSA Sapera LT 8.0 for Windows, or 3rd Party GeniCam GenCP compliant SDK

- 세로 라인 별 최대 프레임 속도 예시

Vertical Lines Acquired	Internal Trigger – Minimum Exposure 10-Tap 8-bit
2176	87.6 fps
2048	92.9 fps
1024	181.2 fps
512	345.0 fps
256	629.7 fps
128	1072 fps
64	1655 fps
32	2267 fps
16	2785 fps
8	3144 fps
4	3367 fps



GENIE NANO-CL INDIVIDUAL MODEL SPECIFICATIONS

CAMERALINK (DECA MODE) 10-TAPS CONFIGURATION

	Active Resolution	Sensor Model	Frame Rate**	Pixel Size	Dynamic Range	Max. Image Circle	Data Format	Part Number
●●● CL-M2450	2448 x 2048	Sony IMX250 (5.1M)	141 fps	3.45 μm	56.4 dB	2/3" Optical Format	8 or 10-Bit Mono	G3-CM30-M2450
●●● CL-C2450	2448 x 2048	Sony IMX250 (5.1M)	141 fps	3.45 μm	56.4 dB	2/3" Optical Format	8 or 10-Bit Bayer	G3-CC30-C2450, G3-CC30-C2450IF (with IR cut-off filter)
●●● CL-M4060	4112 x 2176	Sony IMX255 (8.9M)	88 fps	3.45 μm	56.4 dB	1" Optical Format	8 or 10-Bit Mono	G3-CM30-M4060
●●● CL-C4060	4112 x 2176	Sony IMX255 (8.9M)	88 fps	3.45 μm	56.4 dB	1" Optical Format	8 or 10-Bit Bayer	G3-CC30-C4060, G3-CC30-C4060IF (with IR cut-off filter)
●●● CL-M4040	4112 x 3012	Sony IMX253 (12M)	64 fps	3.45 μm	56.4 dB	1.1" Optical Format	8 or 10-Bit Mono	G3-CM30-M4040
●●● CL-C4040	4112 x 3012	Sony IMX253 (12M)	64 fps	3.45 μm	56.4 dB	1.1" Optical Format	8 or 10-Bit Bayer	G3-CC30-C4040, G3-CC30-C4040IF (with IR cut-off filter)
●●● CL-M4160	4128 x 4128	Teledyne e2v Emerald EV2S16M (16M)	40 fps	2.8 μm	55 dB	1.1" Optical Format	8-Bit Mono	G3-CM30-M4160
●●● CL-C4160	4128 x 4128	Teledyne e2v Emerald EV2S16M (16M)	40 fps	2.8 μm	55 dB	1.1" Optical Format	8-Bit Mono	G3-CC30-C4160
●●● CL-M4090	4096 x 4096	On-Semi Python 16K (16M)	45 fps	4.5 μm	55.2 dB	APS-H Optical Format	8 or 10-Bit Mono	G3-CM10-M4095
●●● CL-M4090-NIR	4096 x 4096	On-Semi Python 16K (16M)	45 fps	4.5 μm	55.2 dB	APS-H Optical Format	8 or 10-Bit Mono	G3-CM12-M4095
●●● CL-C4090	4096 x 4096	On-Semi Python 16K (16M)	45 fps	4.5 μm	55.2 dB	APS-H Optical Format	8 or 10-Bit Bayer	G3-CC10-C4095
●●● CL-M5100	5120 x 5120	On-Semi Python 25K (25M)	30 fps	4.5 μm	55.2 dB	APS-H Optical Format	8 or 10-Bit Mono	G3-CM10-M5105
●●● CL-M5100-NIR	5120 x 5120	On-Semi Python 25K (25M)	30 fps	4.5 μm	55.2 dB	APS-H Optical Format	8 or 10-Bit Mono	G3-CM12-M5105
●●● CL-C5100	5120 x 5120	On-Semi Python 25K (25M)	30 fps	4.5 μm	55.2 dB	APS-H Optical Format	8 or 10-Bit Bayer	G3-CC10-C5105

** Using 10-tap @ 8-bit configuration. Applicable for the Deca model models list only.

CAMERALINK BASE CONFIGURATION

	Active Resolution	Sensor Model	Frame Rate***	Pixel Size	Dynamic Range	Max. Image Circle	Data Format	Part Number
●●● CL-M2420	2448 x 2048	Sony IMX264 (5.1M)	35 fps	3.45 μm	56.4 dB	2/3" Optical Format	8 or 12-Bit Mono	G3-CM31-M2420
●●● CL-C2420	2448 x 2048	Sony IMX264 (5.1M)	35 fps	3.45 μm	56.4 dB	2/3" Optical Format	8 or 12-Bit Bayer	G3-CC31-C2420, G3-CC31-C2420IF (With IR cut-off filter)
●●● CL-M4020	4112 x 3008	Sony IMX304 (12M)	20 fps	3.45 μm	56.4 dB	1.1" Optical Format	8 or 12-Bit Mono	G3-CM31-M4020
●●● CL-C4020	4112 x 3008	Sony IMX304 (12M)	20 fps	3.45 μm	56.4 dB	1.1" Optical Format	8 or 12-Bit Bayer	G3-CC31-C4020, G3-CC31-C4020IF (With IR cut-off filter)

*** Using 3-tap @ 8-bit configuration. Applicable for the Base CL model models list only.