

Piranha4 4K and 2K

High Speed Dual Line CMOS Cameras



Key Features

- High speed: up to 100 kHz in TDI mode and 200 kHz in area mode
- Independent exposure control for each line (HDR)
- Permits longer Camera Link cables
- Compact camera body

Programmability

- Multiple Regions of Interest for calibration and data reduction
- 8, 10 or 12 bit output
- Smart flat field and lens shading correction
- 8 programmable coefficient sets
- GenICam or ASCII compliant interfacing

Typical Applications

- Automated optical inspection
- Transportation safety and security systems
- High performance sorting systems
- Materials grading and inspection systems
- Web inspection
- General purpose machine vision

Regulatory Compliance

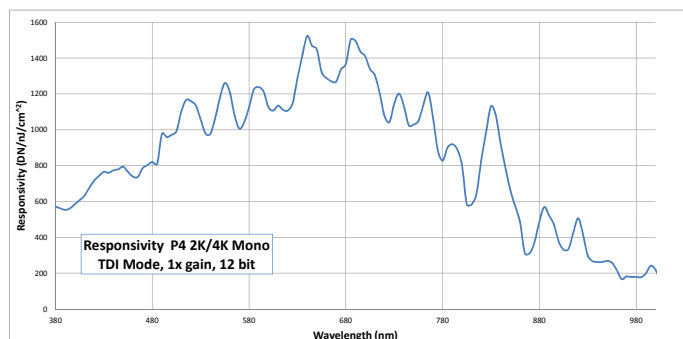
- CE, FCC and RoHS

Fast 100 kHz in TDI mode and 200 kHz in area mode!

Teledyne DALSA expands its Piranha4 dual line CMOS camera family with 4K and 2K resolution models. The new Piranha4 models offer higher speeds and more responsive pixels in a choice of sizes and resolutions. Programmable features include multiple region-of-interest, high dynamic range operation, and rapid bi-directional switching, and are designed to meet today's demanding imaging applications.

Specifications

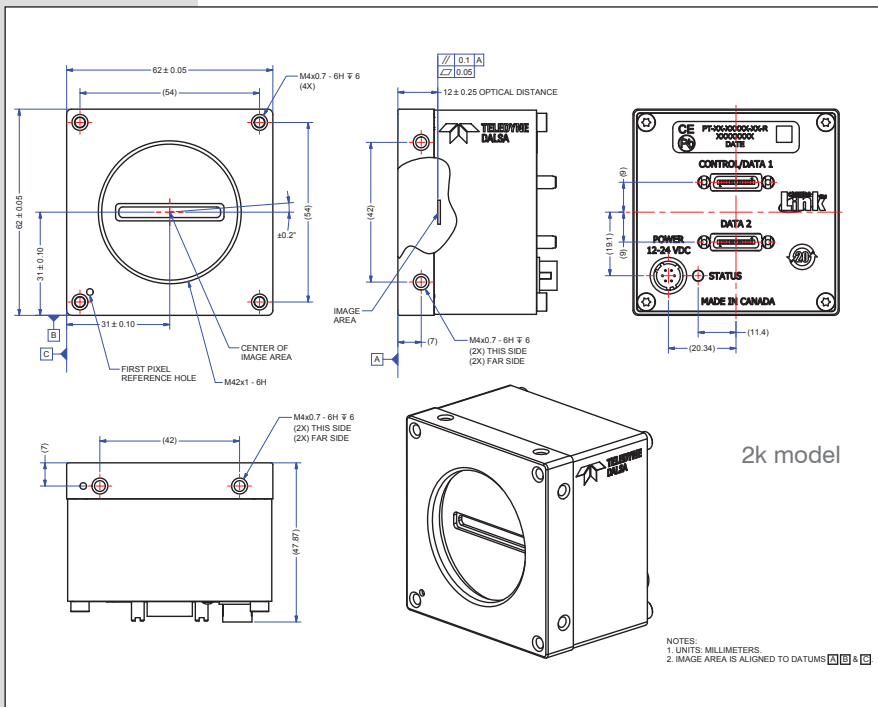
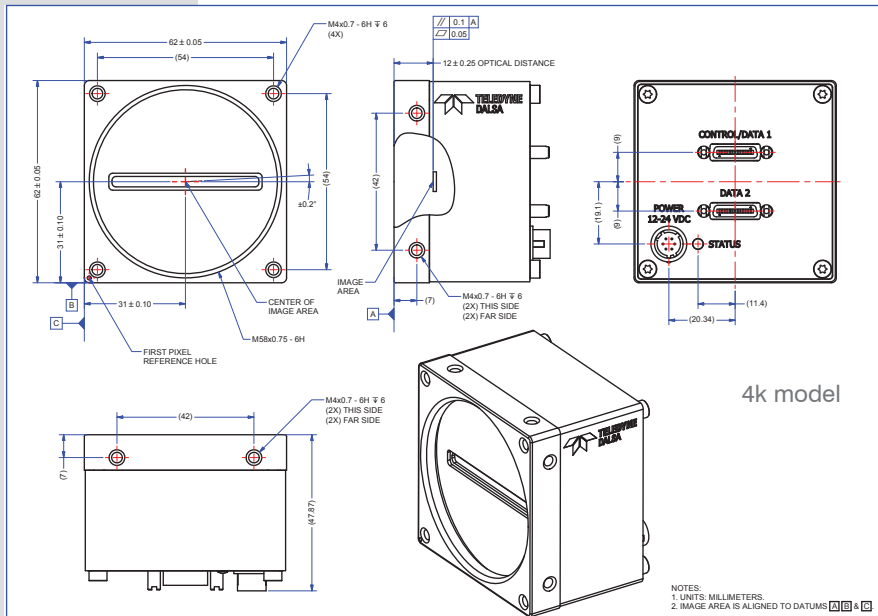
| | |
|--------------------|---|
| Resolution | 4096 x 2 and 2048 x 2 pixels |
| Line Rate | Up to 100 kHz in TDI mode (200 kHz in area mode) |
| Pixel Size | 10.56 μm x 10.56 μm |
| Data Format | 8, 10 or 12 bit selectable |
| Output | Base, Medium, Full and Deca Camera Link |
| Lens Mount | M58 x 0.75 (4k) and M42 x 1 (2k) F-mount adapter available |
| Responsivity | 1400 DN / (nJ / cm ²) in 12 bit at 1x gain |
| Dynamic Range | > 60 dB |
| Nominal Gain Range | 1x to 10x |
| Size | 62 mm x 62 mm x 48 mm |
| Mass | < 340 g |
| Operating Temp | 0 °C to 65 °C (front plate) |
| Power | Hirose 6-pin male |
| Power Dissipation | < 11 W (4k) and < 8.3 W (2k) |
| Control & Data | SDR-26 mini Camera Link |



| Piranha4 Dual Line Models | | | |
|---------------------------|-----------------|--|---|
| Part Number | Resolution | Maximum Line Rates TDI mode (area mode) | Pixel Size |
| P4-CM-04K10D-00-R | 4096 x 2 pixels | 100 kHz (200 kHz) | 10.56 μm x 10.56 μm |
| P4-CM-04K05D-00-R | 4096 x 2 pixels | 50 kHz (100 kHz) | 10.56 μm x 10.56 μm |
| P4-CM-02K10D-00-R | 2048 x 2 pixels | 100 kHz (200 kHz) | 10.56 μm x 10.56 μm |
| P4-CM-02K05D-00-R | 2048 x 2 pixels | 50 kHz (100 kHz) | 10.56 μm x 10.56 μm |

Piranha4 4K and 2K

High Speed Dual Line CMOS Cameras



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Piranha4 Color 2K and 4K

High Speed Trilinear CMOS Cameras



70 kHz line rates trilinear color, superior image quality, and easy to use.

The new Piranha4 trilinear color cameras provide industry leading speeds to meet future requirements of higher throughput in demanding color imaging applications.

Based on Teledyne DALSA's unique CMOS linescan technology, the Piranha4 color family delivers superb color fidelity, responsive pixels, all in a compact footprint and with an easy to use interface. New features include multiple regions of interest for data reduction and regional calibration, sub-pixel spatial correction, factory calibration to white LED, white balance and colour calibration tools.

Key Features

- High speed: up to 70 kHz line rates
- Three native colors (RGB) per pixel
- Combination of various pixel sizes and resolutions
- Bi-directional
- Compact camera body
- Sub-pixel Spatial correction
- Horizontal Parallax Correction

Programmability

- Multiple Regions of Interest for calibration and data reduction
- 8, 10, or 12 bit output
- Flat field and lens shading correction
- 8 programmable coefficient sets
- GenICam or ASCII compliant interfacing

Typical Applications

- 100% print inspection (pharmaceuticals, bank note)
- Electronics inspection
- Materials grading systems
- Web inspection
- High performance color sorting systems
- Food inspection
- General purpose machine vision

Specifications

| | |
|-----------------------|---|
| Resolution | 2048 x 3 pixels or 4096 x 3 pixels |
| Line Rate | Up to 70 kHz |
| Pixel Size | 14.08 μm x 14.08 μm (2k) and 10.56 μm x 10.56 μm (4k) |
| Data Format | 8, 10, or 12 bits, selectable |
| Output | Base, Medium, Full and Deca Camera Link |
| Lens Mount | M42 x 1 (2k) and M58 x 0.75 (4k) F-mount adapter available |
| Responsivity | See graph |
| Dynamic Range | > 60 dB |
| Nominal Gain Range | 1x to 10x |
| Size | 62 mm x 62 mm x 48 mm |
| Mass | < 340 g |
| Operating Temp | 0 °C to 65 °C (front plate) |
| Power | Hirose 6-pin male |
| Power Dissipation | 8 W (2k) and 12 W (4k) |
| Control & Data | SDR-26 mini Camera Link |
| Regulatory Compliance | CE, FCC, and RoHS |

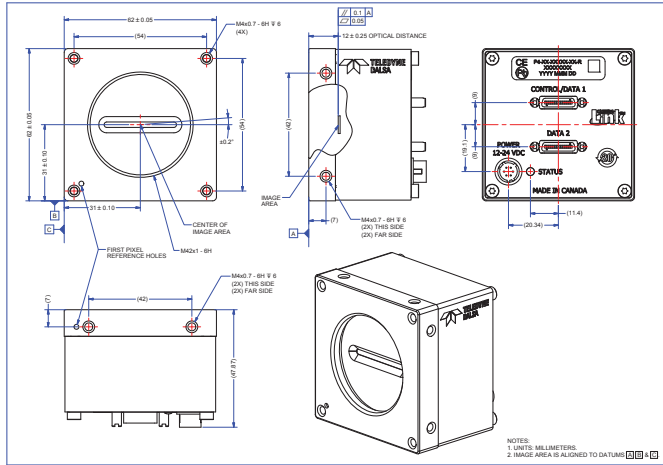
Piranha4 Trilinear Model Comparison

| Part Number | Resolution | Maximum Line | Pixel Size |
|-------------------|-----------------|--------------|---|
| P4-CC-02K07T-00-R | 2048 x 3 pixels | 70 kHz | 14.08 μm x 14.08 μm |
| P4-CC-02K04T-00-R | 2048 x 3 pixels | 40 kHz | 14.08 μm x 14.08 μm |
| P4-CC-04K07T-00-R | 4096 x 3 pixels | 70 kHz | 10.56 μm x 10.56 μm |
| P4-CC-04K04T-00-R | 4096 x 3 pixels | 40 kHz | 10.56 μm x 10.56 μm |

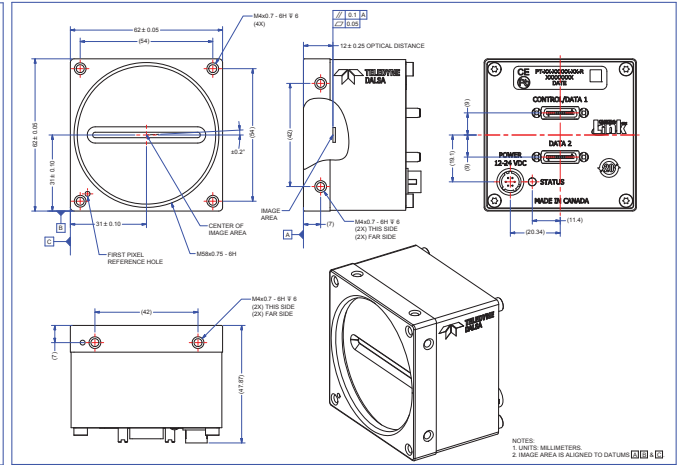


Piranha4 Color Trilinear 2K and 4K

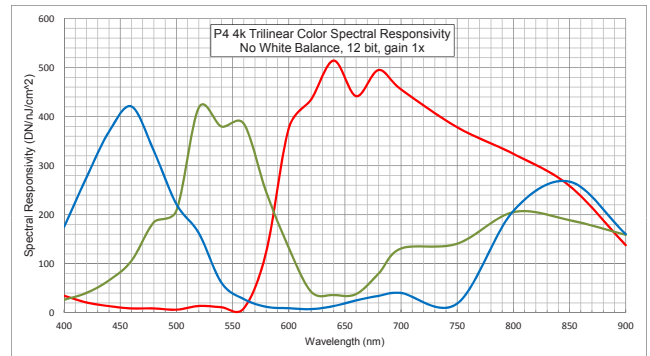
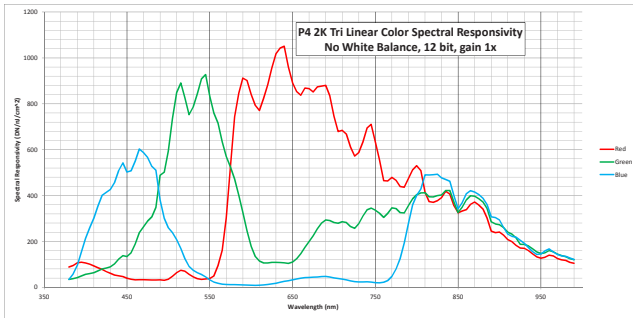
High Speed Trilinear CMOS Cameras



2k model



4k model



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Piranha4 2K RGB + NIR / Mono

High Speed Multi-Spectral Camera



High-speed, multi-spectral camera.

The new Piranha4 quadlinear RGB + NIR / Mono cameras provide industry leading speeds to meet future requirements of higher throughput in multi-spectral imaging applications.

Based on Teledyne DALSA's unique CMOS linescan technology, the Piranha4 multi-spectral camera delivers superb color plus near-infrared (NIR) fidelity, spectrally independent outputs, all in a compact footprint and with an easy to use interface. New features include multiple regions of interest for data reduction and regional calibration, sub-pixel spatial correction, white balance and color calibration tools.

Specifications

| | |
|-----------------------|---|
| Resolution | 2048 x 4 pixels |
| Line Rate | Up to 70 kHz |
| Pixel Size | 14.08 μm x 14.08 μm |
| Data Format | 8, 10, or 12 bits, selectable |
| Output | Base, Medium, Full and Deca Camera Link |
| Lens Mount | M42 x 1 F-mount adapter available |
| Responsivity | See graph |
| Dynamic Range | > 60 dB |
| Nominal Gain Range | 1x to 10x |
| Size | 62 mm x 62 mm x 48 mm |
| Mass | < 340 g |
| Operating Temp | 0 °C to 65 °C (front plate) |
| Power | Hirose 6-pin, +12 V to +24 V DC |
| Power Dissipation | 8 W |
| Control & Data | SDR-26 mini Camera Link |
| Regulatory Compliance | CE, FCC, and RoHS |

Key Features

- High speed: up to 70 kHz line rates
- Three native colors (RGB) plus NIR / Mono per pixel
- Spectrally Independent RGB + NIR outputs
- Bi-directional
- Compact camera body
- Sub-pixel spatial correction
- Horizontal Parallax Correction

Programmability

- Multiple Regions of Interest for calibration and data reduction
- 8, 10, or 12 bit output
- Flat field and lens shading correction
- 8 programmable coefficient sets
- GenICam or ASCII compliant interfacing

Typical Applications

- 100% print inspection (pharmaceuticals, bank note)
- Electronics inspection
- Materials grading systems
- Web inspection
- High performance color sorting systems
- Food inspection
- General purpose machine vision

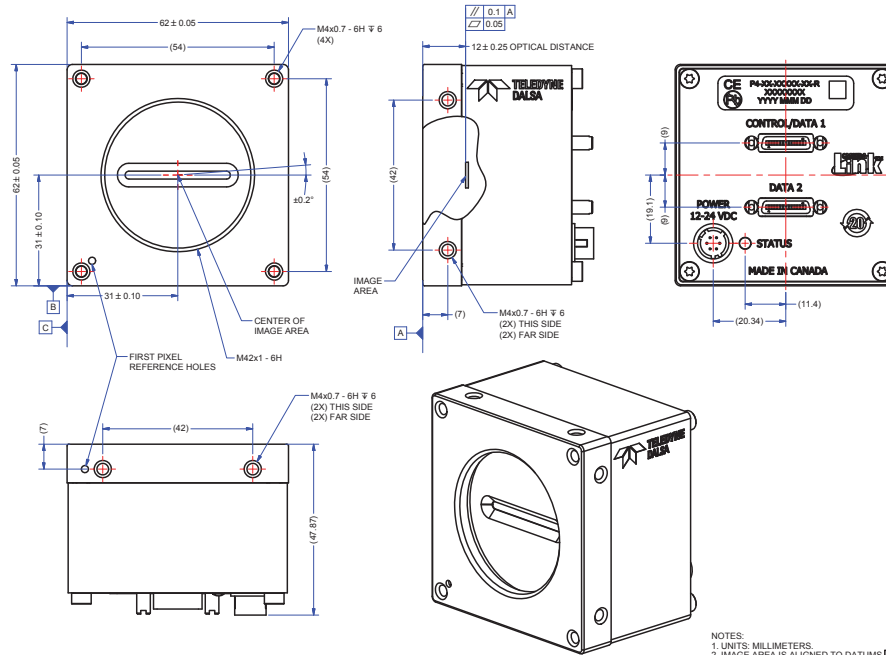
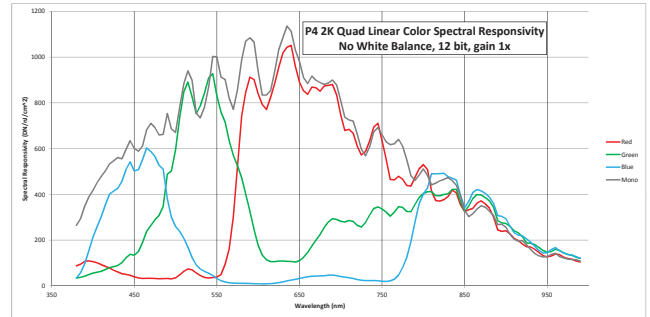
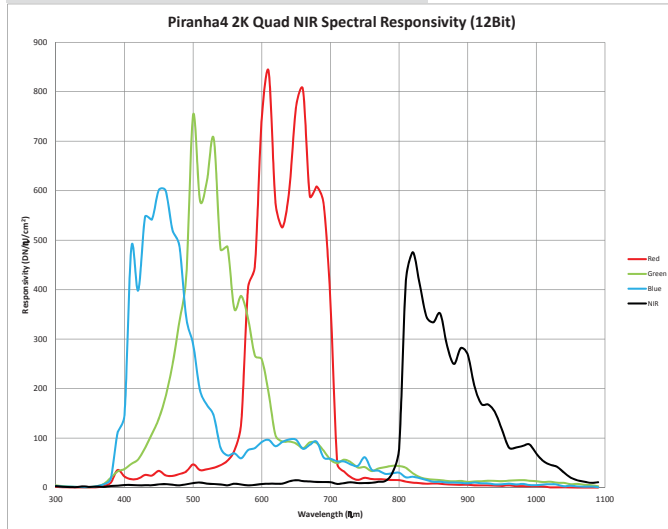
Piranha4 Quadlinear Model Comparison

| Part Number | Resolution | Max Line Rates | Pixel Size | Output |
|-------------------|-----------------|----------------|---|------------|
| P4-CC-02K07Q-00-R | 2048 x 4 pixels | 70 kHz | 14.08 μm x 14.08 μm | RGB + Mono |
| P4-CC-02K07N-01-R | 2048 x 4 pixels | 70 kHz | 14.08 μm x 14.08 μm | RGB + NIR |



Piranha4 2K RGB + NIR / Mono

High Speed Multi-Spectral Camera



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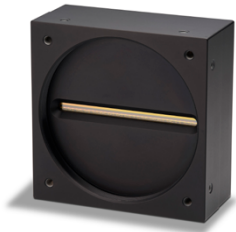
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8K Trilinear Color CMOS Camera



Based on Teledyne e2v's trilinear color CMOS sensor, the new Piranha4 8k camera provides outstanding signal-to-noise for color imaging. The camera has 8k resolution with a $7.5\ \mu\text{m} \times 7.5\ \mu\text{m}$ pixel size for optimized optical design, delivering a maximum line rate of 33 kHz x 3, and a Camera Link interface.

The choice to use either an ASCII command or an advanced GenICam™ compliant interface makes the camera easier to setup, control, and integrate. Programmability includes exposure control, flat field correction, white balance, color correction, and gain settings.

The Piranha4 8k color camera is ideal for printing, PCB, electronics, film, and large format web inspection.

Key Features

- Trilinear color CMOS line scan
- 8k pixel resolution
- Line rates up to 33 kHz x 3
- Exposure control
- 100x anti-blooming
- Camera Link interface
- GenICam or ASCII command interfaces

Programmability

- Save up to eight sets of correction coefficients
- Adjustable gain and offset
- White balance and color correction
- Lens and shading correction
- Test pattern and diagnostics
- Multi-ROI output allows faster line rates

Typical Applications

- Printing inspection
- PCB inspection
- High performance document scanning
- Electronics
- Film inspection
- High throughput applications

Specifications

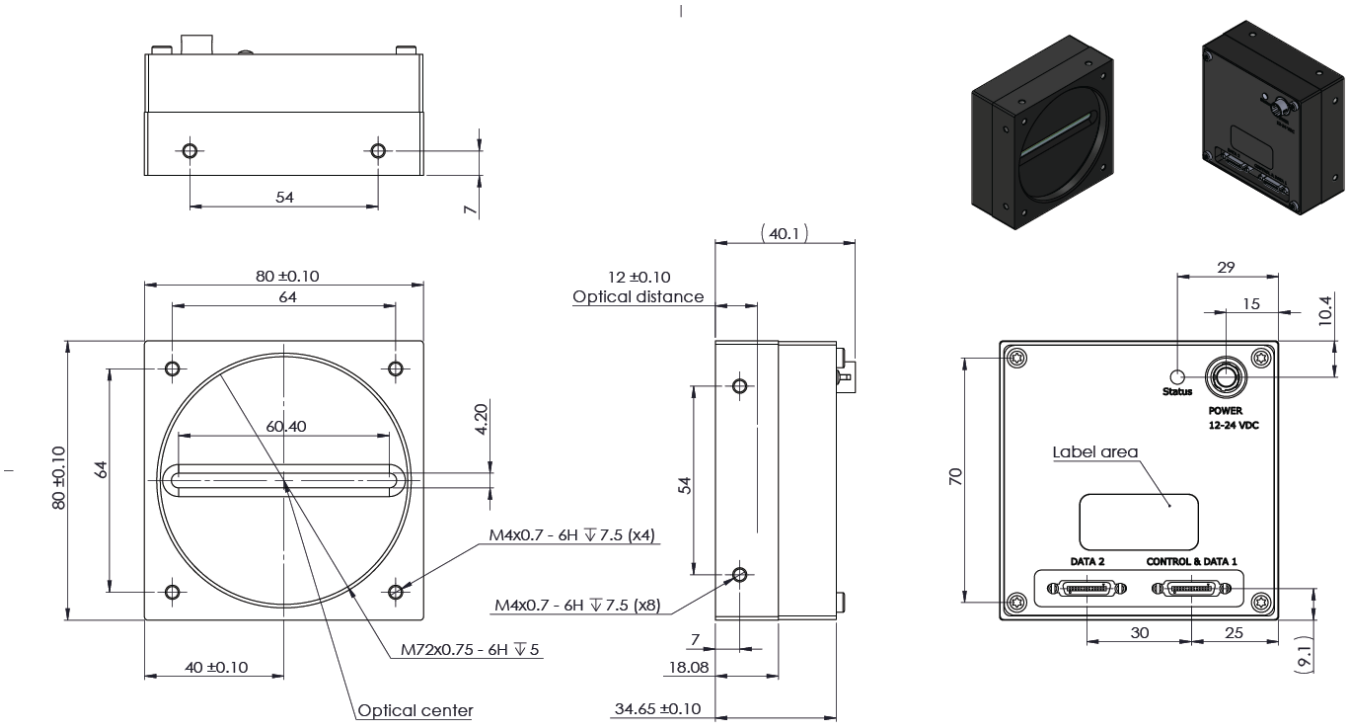
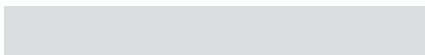
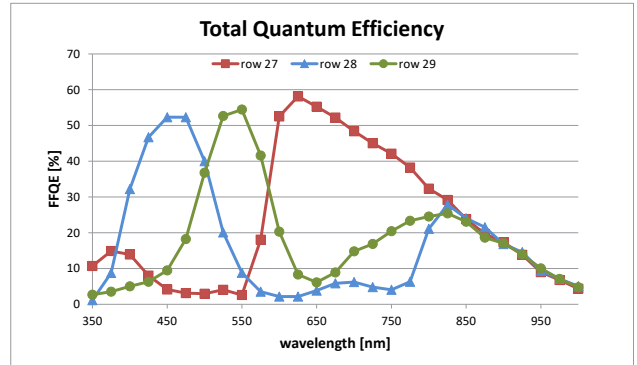
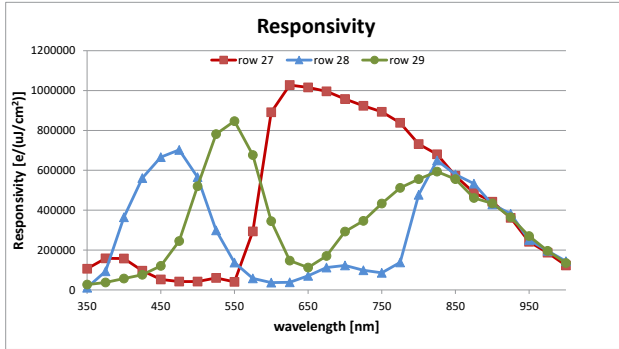
| | |
|-----------------------|---|
| Resolution | 8192 x 3 pixels |
| Line Rate | 33 kHz x 3, maximum |
| Pixel Size | $7.5\ \mu\text{m} \times 7.5\ \mu\text{m}$ |
| Data Format | 24 bit RGB (8 x 3) |
| Output | Camera Link |
| Lens Mount | M72 x 0.75 |
| Responsivity & QE | See graphs |
| Dynamic Range | 56 dB |
| Nominal Gain Range | Up to 12, 1x to 4x |
| Size | 80 mm (W) x 80 mm (H) x 40.1 mm (D) |
| Mass | 295 g |
| Operating Temp | 0 °C to +60 °C, measured at the front plate |
| Power | Hirose 6-pin male, +12 VDC to +24 VDC |
| Power Dissipation | < 6.5 W |
| Control & Data | Camera Link |
| Regulatory Compliance | CE and RoHS |

| Camera Models | | | | |
|-------------------|------------------|--------------------------------|--|--------|
| Part Number | Resolution | Max Line Rates | Pixel Size | Output |
| P4-CC-08K03T-01-R | 8,192 x 3 pixels | 33 kHz x 3 99 kHz aggregate | $7.5\ \mu\text{m} \times 7.5\ \mu\text{m}$ | RGB |



Piranha4 8k Color

Trilinear RGB CMOS Camera



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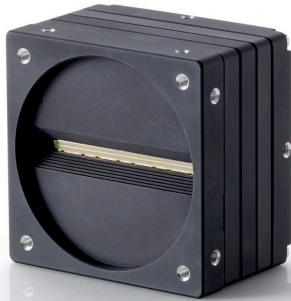


Part of the Teledyne Imaging Group



Piranha4 P4-CC-08K050-00-R

Bilinear Color Line Scan CMOS Camera



Faster, more responsive and in color. The new Piranha4 8k color dual line scan CMOS camera has arrived.

Based on Teledyne DALSA's unique bilinear color line scan CMOS sensor architecture, the new Piranha4 8k camera provides outstanding signal-to-noise for high speed imaging. The P4-8k has 8k resolution with a $7\ \mu\text{m} \times 7\ \mu\text{m}$ pixel size for optimized optical design. The camera delivers a maximum line rate of 50 kHz.

The choice to use either an ASCII command compliant or an advanced GenICam™ compliant interface makes the camera easier to setup, control, and integrate. Programmability includes exposure control, flat field correction, white balance and color correction, and gain settings.

The Piranha4 8k color camera is ideal for flat panel display, electronics, printed material, solar cell, film, and large format web inspection.

Key Features

- Color dual line CMOS line scan
- 8k pixel resolution
- Line rates up to 50 kHz
- Exposure control
- 100x antiblooming
- RGB, RG / BG, or G formats
- Camera Link interface
- GenICam or ASCII command compliant interfaces

Programmability

- Save up to eight sets of correction coefficients
- Adjustable gain and offset
- White balance and color correction
- Lens and shading correction
- Test pattern and diagnostics
- Multi-ROI output allows faster line rates

Typical Applications

- Flat-panel display inspection
- Printing inspection
- High performance document scanning
- Electronics
- Film inspection
- High throughput applications

Specifications

| | |
|-----------------------|--|
| Resolution | 8192 x 2 pixels |
| Line Rate | 50 kHz Max |
| Pixel Size | 7.04 μm x 7.04 μm |
| Data Format | 8 bit |
| Output | Camera Link |
| Lens Mount | M72 x 0.75 |
| Responsivity | See graph |
| Dynamic Range | 62 dB |
| Nominal Gain Range | 1x to 10x |
| Size | 80 mm (W) x 80 mm (H) x 57 mm (D) |
| Mass | 700 g |
| Operating Temp | 0 °C to 50 °C, measured at the front plate |
| Power | Hirose 6-pin male, +12 VDC to +24 VDC |
| Power Dissipation | 16 W |
| Control & Data | Camera Link |
| Regulatory Compliance | CE and RoHS |
| Part Number | P4-CC-08K050-00-R |

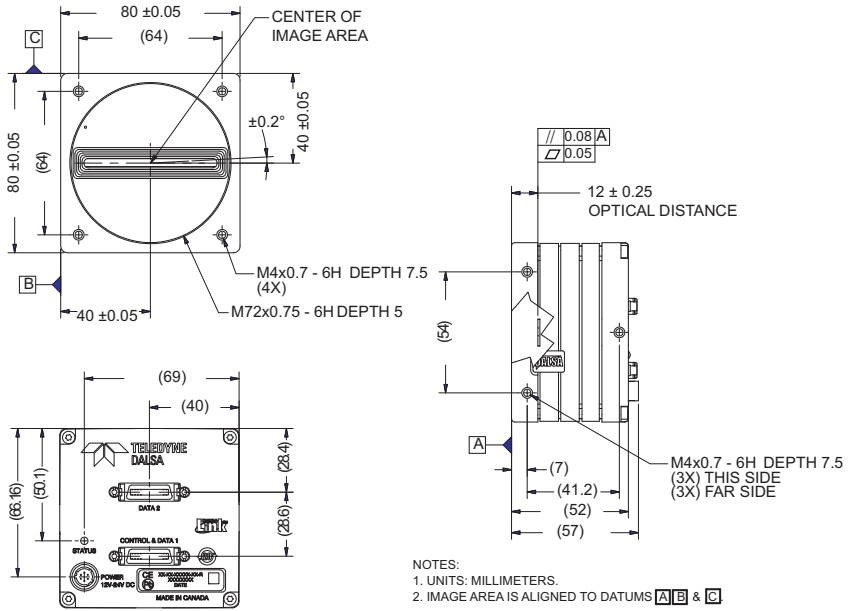
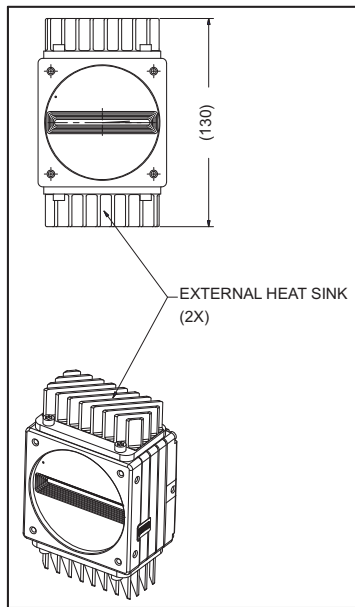
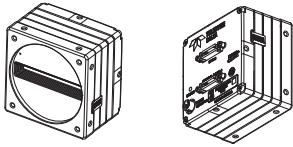
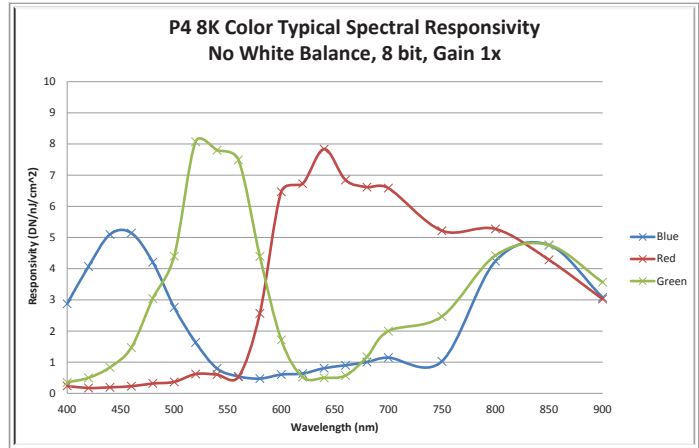


Piranha4 P4-CC-08K050-00-R

Bilinear Color Line Scan CMOS Camera

With line rates up to 50 kHz and 8k resolution, this camera inspects and detects with unrivalled precision, speed, and responsivity.

The new Piranha4 camera takes machine vision to the next level.



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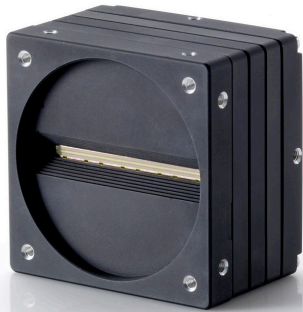
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Piranha4 P4-CM-08K070-00-R

Mono Dual Line Scan CMOS Camera



Faster and more responsive. The new Piranha4 8k dual line scan CMOS camera has arrived.

Based on Teledyne Dalsa's unique line scan CMOS sensor architecture, the new Piranha4 8k dual line scan camera provides outstanding signal-to-noise for high speed imaging. The P4-8k has 8k resolution with a $7\ \mu\text{m} \times 7\ \mu\text{m}$ pixel size for optimized optical design. The camera delivers a maximum line rate of 70 kHz in a high responsivity summing mode.

Precise sensor alignment simplifies multiple camera calibration at the system level and an advanced GenICam™ compliant interface makes the camera easier to setup, control, and integrate. Programmability includes exposure control, flat field correction, and gain settings.

The Piranha4 8k camera is ideal for flat panel display, printed circuit board, solar cell, film, and large format web inspection.

Key Features

- Dual line CMOS line scan
- 8k pixel resolution
- Line rates up to 70 kHz
- 100% fill factor
- Exposure control
- 100x antiblooming
- Camera Link interface
- GenICam or ASCII command compliant interfaces

Programmability

- Save up to eight sets of flat-field correction coefficients
- Adjustable gain and offset
- Lens and shading correction
- Test pattern and diagnostics

Typical Applications

- Flat-panel display inspection
- Printed circuit board inspection
- Parcel sorting
- High performance document scanning
- High throughput applications

Specifications

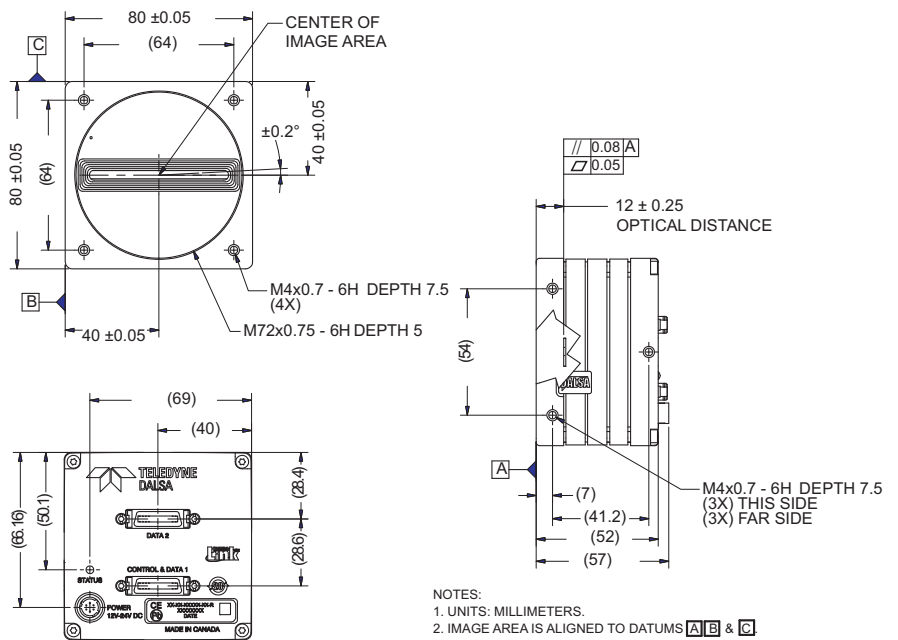
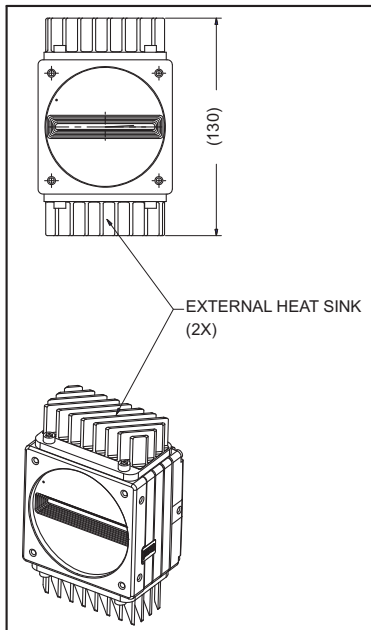
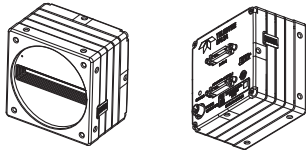
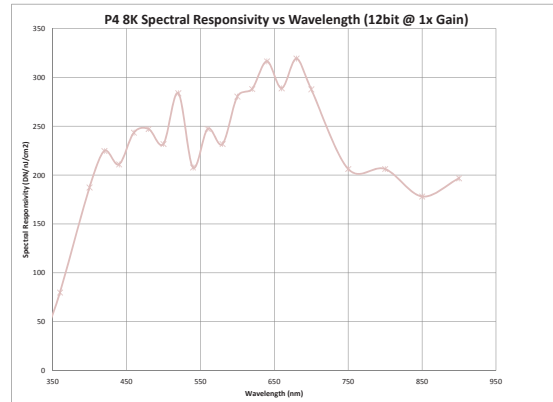
| | |
|-----------------------|--|
| Resolution | 8192 x 2 pixels |
| Line Rate | 70 kHz Max |
| Pixel Size | $7.04\ \mu\text{m} \times 7.04\ \mu\text{m}$ |
| Data Format | 8 bit or 12 bit selectable |
| Output | Camera Link |
| Lens Mount | M72 x 0.75 |
| Responsivity | 276 DN / (nJ / cm ²) broadband @ 1x gain, 12 bit |
| Dynamic Range | 63 dB |
| Nominal Gain Range | 1x to 10x |
| Size | 80 mm (W) x 80 mm (H) x 57 mm (D) |
| Mass | 700 g |
| Operating Temp | 0 °C to 50 °C, measured at the front plate |
| Power | Hirose 6-pin male, +12 VDC to +24 VDC |
| Power Dissipation | 16 W |
| Control & Data | Camera Link |
| Regulatory Compliance | CE and RoHS |
| Part Number | P4-CM-08K070-00-R |

Piranha4 P4-CM-08K070-00-R

Mono Dual Line Scan CMOS Camera

With line rates up to 70 kHz and 8k resolution, this camera inspects and detects with unrivalled precision, speed, and responsivity.

The new Piranha4 camera takes machine vision to the next level.



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