

## CV60 Series

### High-resolution cameras that deliver outstanding frame rates

The CV60 Series of area scan cameras deliver outstanding image quality and industrial grade reliability in a compact footprint. Used with Zebra hardware inclusive of industrial controllers and frame grabbers, and driven by Zebra's powerful vision-based software options, the CV60 Series supports a wide range of industrial machine vision inspection and automation applications. With eight models to choose from (four monochrome, four color), the CV60 Series features high-resolution CMOS sensors with resolutions ranging from 2.3 to 12.3 megapixels, with GigE Vision interface.



#### CV60 Series Area Scan Cameras

Every model comes standard with industrial grade shock and vibration ratings (80G/10G), excellent thermal dissipation, and outstanding reliability to keep critical inspection systems running at maximum uptime.

The CV60 Series includes a robust set of capabilities like region-of-interest (ROI), image flipping and mirroring (most models), blemish compensation and shading correction—plus, advanced features like two different sequencer modes and an intelligent, user-customizable auto-exposure function (ALC).

Additional features include pixel size rescaling and lossless video compression.

- Ideal for setups requiring three or more cameras
- ROI settings for added flexibility
- Horizontal/vertical image flip function, plus blemish correction and shading compensation
- Includes Sequencer function and Automatic Level Control (ALC) for dynamic lighting conditions
- Compact size with excellent shock and vibration resistance
- Accepts power by Power over Ethernet (PoE) or separate 6-pin connector
- C-mount lens

To learn more, please visit [www.zebra.com](http://www.zebra.com)

# Specifications

## Markets and Applications

### Portfolio Specifications<sup>1</sup>

System Clock	74.25 MHz (for pulse generator)
EMVA 1288 Parameters Absolute Sensitivity Maximum SNR	10-bit output format Mono: 3.71 p Color: 4.86 p (l = 527 nm) Mono: 39.7 dB Color: 39.7 dB
Traditional SNR <sup>2</sup>	Greater than 60 dB mono, Greater than 60 dB color (0 dB gain, 10-bit)
Video Signal Output	Monochrome: 8/10/12-bits <sup>3</sup> Color: 8/10/12-bit Bayer <sup>3</sup>
Gain Control	Manual/auto 0 dB to +42 dB
White Balance	Off, presets, or one-push/continuous AWB
Gamma/LUT	0.45 to 1.0 (9 steps) or 257-point programmable LUT
Synchronization	Internal
Video Modes	Normal/Single ROI, Sequencer (Trigger and Command)
Trigger Input	Opto In, Pulse Generators (4), Software, NAND Out (2), User Output (4)
Exposure Modes	Timed/EPS, RCT, Trigger Width, Auto
Shading Correction	Flat shading, color shading (color model)
Pre-Processing Functions	H and V flip (mirroring), blemish compensation, H and V decimation
Operating Temp. (Ambient)	23°F/-5°C to 113°F/45°C (20 to 80% non-condensing)
Storage Temp. (Ambient)	-13°F/-25°C to 140°F/60°C (20 to 80% non condensing)
Vibration	10G (20 Hz to 200 Hz, XYZ directions)
Shock	80G
Regulations	CE(EN 55032:2015(CISPR32:2015), EN 55035:2017(CISPR35:2016)), FCC Part 15 Class A, RoHS/WEEE, KC
Power	6-pin: +10V to +25V DC. 2.7 W typical @ +12 V PoE: +36V to +57 V DC. 3.7 W typical @ +48 V
Lens	C-mount
Dimensions (H x W x L)	29 mm x 29 mm x 51.5 mm
Weight	65 g

### Connector Pin-Out

DC In/Trigger HIROSE HR10A-7R-6PB(73)	Pin 1: DC in 10 V to 25 V Pin 2: Opto In+ Pin 3: Opto In- Pin 4: Opto Out+ Pin 5: Opto Out- Pin 6: Ground
GigE Vision Interface RJ-45 with locking screws	Pin 1: TRD + (O) Pin 2: TRD- (O) Pin 3: TRD+ (1) Pin 4: TRD+ (2) Pin 5: TRD- (2) Pin 6: TRD- (1) Pin 7: TRD+ (3) Pin 8: TRD- (3)

### Manufacturing

- Quality assurance
- Product quality and error-proofing
- Quality inspections

### Footnotes

1. Specifications subject to change without notice.
2. Traditional SNR is based on random noise in a single frame, where EMVA SNR measurements consider more comprehensive noise sources and variance over time.
3. 12-bit output only available in video processing bypass mode.
4. Tracking speeds and max. values adjustable.

### Model Specifications<sup>4</sup>

2.3 MP GigE	Color and Mono Sensors: 2.3 MP Pixels: 1920 x 1200 px Light Spectrum: Color: Visible Mono: Visible + NIR Frame Rate: 50 fps Sensor Name: IMX392 Optical Format: 1/2.3 in. Sensor Diagonal: 7.8 mm Active Sensor Area: 6.6 x 4.4 mm Read-out modes: Full: 1920 (h) x 1200 (v) up to 49.9 fps
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## Model Specifications<sup>4</sup>

	<p>ROI (single): H: 96 - 1904 pixels in 16-pixel steps  V: 8 to 1198 lines in 2-line steps  Binning : 1x2, 2x1, 2x2 (mono only)  Electronic shutter:  Timed: 14.73 <math>\mu</math>s to 8 s in 1 <math>\mu</math>s steps  Auto: 100 <math>\mu</math>s to 20 ms at full resolution  Auto Level Control (ALC):  Shutter range from 100 <math>\mu</math>s to 20 ms,  gain range from 0 dB to +42 dB.</p>
5 MP GigE	<p>Color and Mono  Sensors: 5 MP  Pixels: 2448 x 2048 px  Light Spectrum:  Color: Visible  Mono: Visible + NIR  Frame Rate: 22 fps  Sensor Name: IMX264  Optical Format: 2/3 in.  Sensor Diagonal: 11 mm  Active Sensor Area: 8.5 x 7.1 mm  Read-out modes:  Full: 2448 (h) x 2048 (v) up to 22.9 fps  ROI (single): H: 96 - 2432 pixels in 16-pixel steps  V: 8 to 2046 lines in 2-line steps  Binning : 1x2, 2x1, 2x2 (mono only)  Electronic shutter:  Timed: 14.73 <math>\mu</math>s to 8 s in 1 <math>\mu</math>s steps  Auto: 100 <math>\mu</math>s to 43.6 ms at full resolution  Auto Level Control (ALC):  Shutter range from 100 <math>\mu</math>s to 43.6 ms,  gain range from 0 dB to +42 dB.</p>
8.9 MP GigE	<p>Color and Mono  Sensors: 8.9 MP  Pixels: 4096 x 2160 px  Light Spectrum:  Color: Visible  Mono: Visible + NIR  Frame Rate: 12 fps  Sensor Name: IMX267  Optical Format: 1 in.  Sensor Diagonal: 16 mm  Active Sensor Area: 14.1 x 7.4 mm  Read-out Modes:  Full: 4096 (h) x 2160 (v) up to 12.99 fps  ROI (single): H: 96 - 4080 pixels in 16-pixel steps  V: 8 to 2158 lines in 2-line steps  Binning: 1x2, 2x2 (mono only)  Electronic shutter:  Timed: 15.26 <math>\mu</math>s to 8 s in 1 <math>\mu</math>s steps  Auto: 100 <math>\mu</math>s to 76.9 ms at full resolution  Auto Level Control (ALC):  Shutter range from 100 <math>\mu</math>s to 76.9 ms,  gain range from 0 dB to +42 dB.</p>
12.3 MP GigE	<p>Color and Mono  Sensors: 12.3 MP  Pixels: 4096 x 3000 px  Light Spectrum:  Color: Visible  Mono: Visible + NIR  Frame Rate: 9 fps  Sensor Name: IMX304  Optical Format: 1.1 in.  Sensor Diagonal: 17.5 mm  Active Sensor Area: 14.1 x 10.3 mm  Read-out Modes:  Full: 4096 (h) x 3000 (v) up to 9.3 fps  ROI (single): H: 96 - 4080 pixels in 16-pixel steps  V: 8 to 2998 lines in 2-line steps  Binning: 1x2, 2x1, 2x2 (mono only)  Electronic shutter:  Timed: 15.26 <math>\mu</math>s to 8 s in 1 <math>\mu</math>s steps  Auto: 100 <math>\mu</math>s to 107.5 ms at full resolution  Auto Level Control (ALC):  Shutter range from 100 <math>\mu</math>s to 107.5 ms, gain range from 0 dB to +42 dB.</p>



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