CV60 GigE Series

High-resolution cameras that deliver outstanding frame rates

The CV60 GigE Series 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 GigE Series supports a wide range of industrial machine vision inspection and automation applications. With twelve models to choose from (six monochrome, six color), these cameras feature high-resolution CMOS sensors with resolutions ranging from 2.3 to 24.5 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

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Specifications

Portfolio Specifications[1]	
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[2]	Greater than 60 dB mono, Greater than 60 dB color (0 dB gain, 10-bit)
Video Signal Output	Monochrome: 8/10/12-bits[3] Color: 8/10/12-bit Bayer[3]
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)	2.3 to 12.3 MP: 29 mm x 29 mm x 51.5 mm 20.3 & 24.5 MP: 29 mm x 29 mm x 55 mm
Weight	65 g

Model Specifications[4]	
Specifications	
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 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 µs to 8 s in 1 µs steps Auto: 100 µs to 20 ms at full resolution Auto Level Control (ALC): Shutter range from 100 µs to 20 ms, gain range from 0 dB to +42 dB.
5 MP GigE	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 µs to 8 s in 1 µs steps Auto: 100 µs to 43.6 ms at full resolution Auto Level Control (ALC): Shutter range from 100 µs to 43.6 ms, gain range from 0 dB to +42 dB.
8.9 MP GigE	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 µs to 8 s in 1 µs steps Auto: 100 µs to 76.9 ms at full resolution Auto Level Control (ALC): Shutter range from 100 µs to 76.9 ms, gain range from 0 dB to +42 dB.

Markets and Applications

Manufacturing

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

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Model Specifications[4]	
Specifications	
12.3 MP GigE	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 µs to 8 s in 1 µs steps Auto: 100 µs to 107.5 ms at full resolution Auto Level Control (ALC): Shutter range from 100 µs to 107.5 ms, gain range from 0 dB to +42 dB.
20.3 MP GigE	Color and Mono Sensors: 20.3 MP Pixels: 4512 x 4512 px Light Spectrum: Color: Visible Mono: Visible + NIR Frame Rate: 6 fps Sensor Name: IMX541 Pregius S Optical Format: 1.1 in. Sensor Diagonal: 17.5 mm Active Sensor Area: 12.4 x 12.4 mm Read-out Modes: Full: 4512 (h) x 4512 (v) up to 5 fps ROI (single): H: 96 to 4512 pixels in 8 pixel steps, V: 8 to 4512 lines in 2-line steps Binning: 1x2, 2x1, 2x2 (mono only) Electronic shutter: Timed: 3.5 µs to 8 sec. in 1 µs steps Auto: 100 µs to 166.6 ms at full resolution Auto Level Control (ALC): Shutter range from 100 µs to 166.6 ms, gain range from 0 dB to +42 dB
24.5 MP GigE	Color and Mono Sensors: 24.5 MP Pixels: 5328 x 4608 px Light Spectrum: Color: Visible Mono: Visible + NIR Frame Rate: 5 fps Sensor Name: IMX540 Pregius S Optical Format: 1.2 in. Sensor Diagonal: 19.3 mm Active Sensor Area: 14.6 x 12.6 mm Read-out Modes: Full: 5328 (h) x 4608 (v) up to 4 fps ROI (single): H: 96 to 5328 pixels in 8 pixel steps V: 8 to 4608 lines in 2 line steps Binning: 1x2, 2x1, 2x2 (mono only) Electronic shutter: Timed: 3.5 µs to 8 sec. in 1 µs steps Auto: 100 µs to 200 ms at full resolution Auto Level Control (ALC): Shutter range from 100 µs to 200 ms, gain range from 0 dB to +42 dB

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)

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.

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