SP-12000C-CXP4
Technical Datasheet

CMV12000

JAi ®
See the possibilities

CoaXPress ®
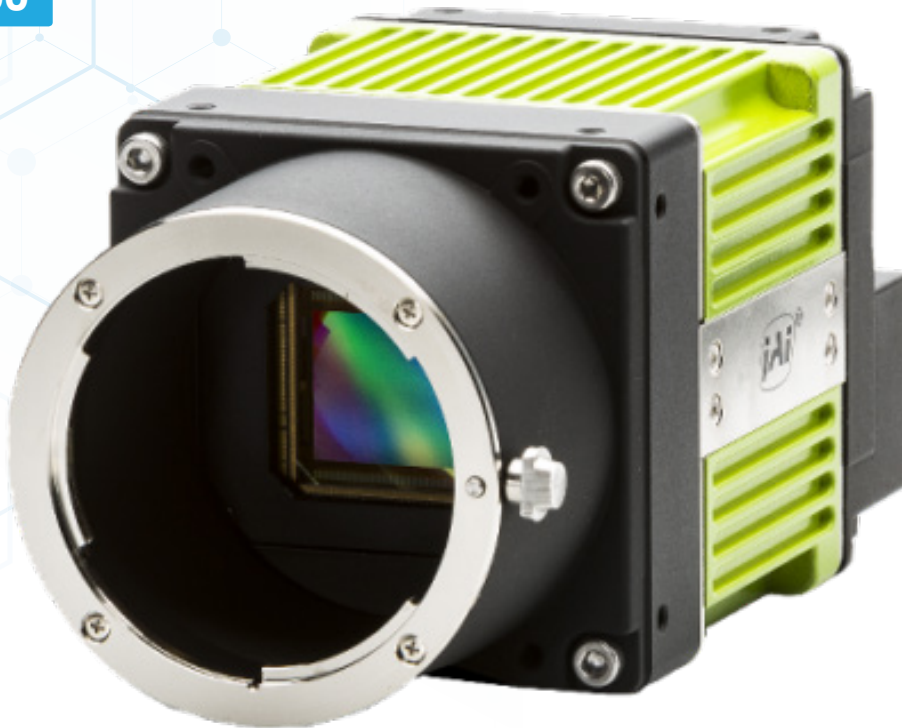
Apex Series

Spark Series area scan cameras are the perfect choice for machine vision applications demanding high quality images with the highest possible throughput. They feature the latest CMOS imagers delivering high resolution images at speeds as much as 10 times faster than traditional CCD cameras.

For example, 45-megapixel (MP) models can deliver over 50 fps output while some 5-MP models run at 250 fps or more. Using the region-of-interest (ROI) feature, even higher frame rates can be achieved.
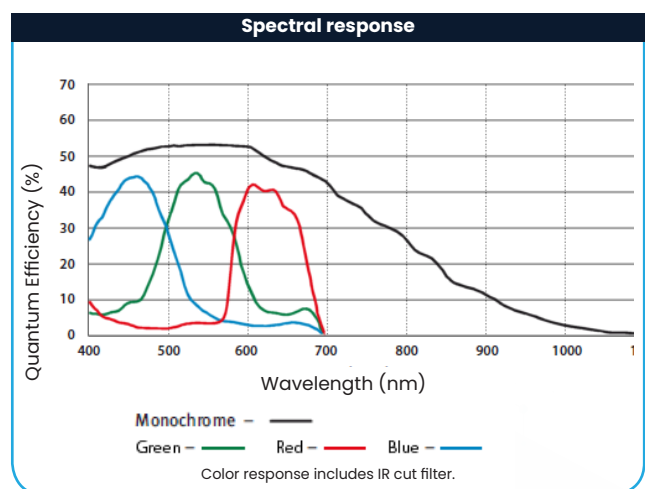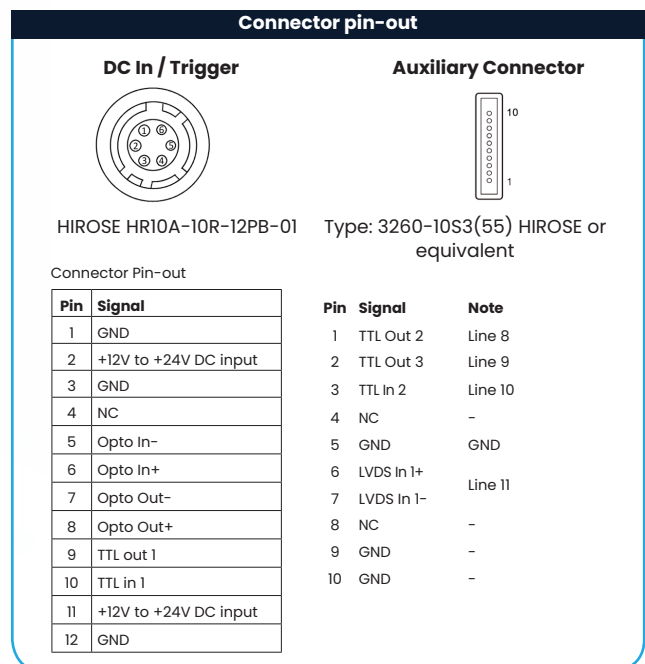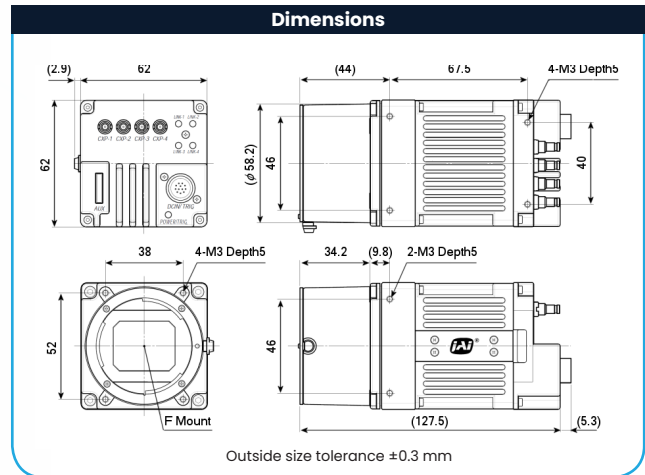
Specification Highlights

SENSOR:	CMV12000	**SHUTTER:**	Global Shutter
FORMAT:	APS-C	**FRAME RATE:**	189 fps
PIXEL SIZE:	5.5 x 5.5 μm	**INTERFACE:**	CoaXPress-4-Cable (PoCXP)
LENS MOUNT:	F-Mount	**RESOLUTION MP:**	12 MP
SPECTRUM:	Color (Visible)	**RESOLUTION WxH:**	4096 x 3072 px

Specifications		SP-12000-CXP4
Sensor		APS-C size CMOS global shutter (CMV12000)
Frame rate, full frame		189 frames/sec. @ 8-bit, CXP6_X4
Active area		22.5 mm (h) x 16.9 mm (v), 28.16 mm diagonal
Cell size		5.5 µm (h) x 5.5 µm (v)
Active pixels		4096 (h) x 3072 (v)
Read-out modes Full ROI		4096 (h) x 3072 (v) up to 189 fps 128-4096 in 16-pixel steps 16-3072 in 2-line steps
Binning		1x2, 2x1, 2x2 (monochrome only)
EMVA 1288 Parameters Absolute sensitivity (mono) Absolute sensitivity (color) Maximum SNR (mono) Maximum SNR (color)		10-bit output format, 90 fps 35.76 p (λ = 525 nm) 46.58 p (λ = 525 nm) 39.60 dB 37.77 dB
Traditional SNR*	mono color	>53 dB (0 dB gain) >50 dB (0 dB gain, green)
Video signal output	mono color	8/10-bit monochrome 8/10-bit Bayer (12-bit available in video process bypass mode)
Interface		CoaXPress v1.1 (CXP-6, DIN 1.0/2.3 connectors) Link Configs: CXP6_X4, CXP6_X2, CXP6_X1 CXP3_X4, CXP3_X2, CXP3_X1
Gain		Manual/automatic 0 dB to +24 dB
White balance (SP-12000C)		Manual, one-push auto, or continuous (3000K to 9000K)
Gamma		0.45-1.0 (9 steps) or 256-point LUT
Synchronization		Internal
Trigger input		TTL, CXP, Pulse Generators (4), Software, NAND Out (2), GPIO
Trigger modes		EPS, PIV, Trigger Width, Sequence
Electronic shutter Timed exposure Trigger width		15 µs to 8 sec in 1 µs steps 15 µs to ∞ sec.
Auto Level Control (ALC)		Shutter range from 100 µs to ~5.3 ms, gain range from 0 dB to +24 dB Tracking speeds and max values adjustable.
Pre-processing functions		Flat field correction, color shading correction (SP-12000C), blemish compensation (1000 pixels), black level control, DSNU correction
Operating temperature		-5ºC to +30ºC
Storage temperature		-25ºC to +60ºC
Humidity		20 - 80% non-condensing
Vibration		10 G (20Hz to 200Hz XYZ)
Shock		80 G
Regulations		CE (EN61000-6-2, EN61000-6-3), FCC Part 15 class B, RoHS/WEEE
Power	12-pin PoCXP	12V to 24V DC ± 10%. 12W typical @ +12V 24V DC ± 2V. 12W typical @ +24V
Lens mount		F-mount (46.5 mm flangeback)
Dimensions (H x W x L)		62 mm x 62 mm x 127.5 mm
Weight		510 g

Ordering Information

SP-12000M-CXP4	Monochrome camera with four-channel CoaXPress
SP-12000C-CXP4	Color camera with four-channel CoaXPress

*Traditional SNR is based on random noise in a single frame, where EMVA SNR measurements consider more comprehensive noise sources and variance over time. For a more complete description, see the manual.

Dimensions

Outside size tolerance ±0.3 mm

Connector pin-out

DC In / Trigger

HIROSE HR10A-10R-12PB-01

Connector Pin-out

Pin	Signal
1	GND
2	+12V to +24V DC input
3	GND
4	NC
5	Opto In-
6	Opto In+
7	Opto Out-
8	Opto Out+
9	TTL out 1
10	TTL in 1
11	+12V to +24V DC input
12	GND

Auxiliary Connector

Type: 3260-10S3(55) HIROSE or equivalent

Pin	Signal	Note
1	TTL Out 2	Line 8
2	TTL Out 3	Line 9
3	TTL In 2	Line 10
4	NC	-
5	GND	GND
6	LVDS In 1+	Line 11
7	LVDS In 1-	
8	NC	-
9	GND	-
10	GND	-

Spectral response

Monochrome —
Green — Red — Blue —

Color response includes IR cut filter.

Product Highlights

- Large format 12 MP CMOS imager (global shutter)
- APS-C optical format with 28.16 mm diagonal
- Up to 189 fps at full resolution
- 5.5 µm square pixels in a 4:3 aspect ratio
- Exposure control from 50 µs (1/20,000) to 8 seconds in 1 µs steps
- Single- and multi-ROI modes for flexible readout, windowing, or increasing frame rate
- Flat-field and blemish compensation plus in-camera CMOS pattern correction
- Built-in high dynamic range function provides up to 90 dB dynamic range (monochrome only)
- 2X binning for increased sensitivity (monochrome only)
- Automatic Level Control (ALC) for dynamic lighting conditions
- 8/10/12-bit digital output over four-channel CoaXPress interface
- Monochrome or color models with built-in color interpolation on color model
- 12-pin connector for power and GPIO, plus additional I/O via 10-pin auxiliary connector
- F-mount lens mount

Additional Product Images