

**SP-20000-CXP2**  
20-megapixel CMOS global shutter



- **Large format 20 MP CMOS imager (global shutter)**
- **30 fps at full resolution**
- **6.4  $\mu\text{m}$  square pixels**
- **User selectable ROI**
- **Horizontal and vertical binning (monochrome models) for increased sensitivity**
- **Flat-field and blemish compensation plus in-camera CMOS pattern correction**
- **CMOS imager includes correlated double sampling (CDS) function for improved uniformity**
- **8/10/12-bit digital output over two-channel CoaXPRESS interface\***
- **Accepts power via CoaXPRESS or separate 12-pin connector**
- **Monochrome or color models with Bayer or built-in color interpolation on color model**
- **F-mount lens mount**
- **Automatic Level Control (ALC) for dynamic lighting conditions**

\*Some video processing functions not available with 12-bit output

# Specifications for SP-20000-CXP2

# Spark Series

Specifications	SP-20000-CXP2
Sensor	41 mm CMOS global shutter (CMV20000)
System clock	40 MHz (for pulse generator)
Frame rate, full frame	30 frames/sec.
Active area	32.77 mm (h) x 24.58 mm (v), 41 mm diagonal
Cell size	6.4 μm (h) x 6.4 μm (v)
Active pixels	5120 (h) x 3840 (v)
Horizontal output frequency	15.6 kHz to 124.8 kHz depending on tap geometry and link configuration
Read-out modes	Full ROI: 5120 (h) x 3840 (v) @ 30 fps Any start position. 8-5120 pixels wide x 2-3840 lines high Width in 8 pixels/step Height in 2 lines/step
Binning (mono)	1x2, 2x1, 2x2 (frame rate does not change)
EMVA 1288 Parameters	10-bit output format
Absolute sensitivity (mono)	16.05 p (λ = 525 nm)
Absolute sensitivity (color)	18.14 p (λ = 525 nm)
Maximum SNR (mono)	40.24 dB
Maximum SNR (color)	38.32 dB
Traditional SNR*	mono: >53 dB (0 dB gain) color: >51 dB (0 dB gain, green)
Video signal output	mono: 8/10/12-bit monochrome color: 8/10/12-bit Bayer or 24-bit RGB Some video functions not available with 12-bit
Auto-iris lens video output	0.7Vp-p, with 0.3V horiz. sync
Gain	Manual/automatic 0 dB to +24 dB
White balance (SP-20000C)	Manual, one-push auto, or continuous (3000K to 9000K)
Gamma	0.45-1.0 (8 steps) or 256-point LUT
Synchronization	Internal
Trigger input	TTL, CXP, Pulse Generators (4), Software, NAND Out (2), GPIO
Trigger modes	EPS, Trigger Width, Timed RCT (with ALC), PIV
Electronic shutter	Timed exposure: 304 μs to 8 sec in 1 μs steps Auto shutter: 1/30 to 1/3289 sec.
Auto Level Control (ALC)	Shutter range from 1/30 to 1/3289, gain range from 0 dB to +24 dB. Tracking speeds and max values adjustable.
Pre-processing functions	Flat field correction, color shading correction (SP-20000C), blemish compensation (up to 1000 pixels)
Operating temperature	-45°C to +70°C†
Storage temperature	-45°C to +70°C
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	12V to 24V DC ± 10%. 7.9W typical (full frame @ 12V)
Lens mount	F-mount
Dimensions (H x W x L)	62 mm x 62 mm x 84.5 mm
Weight	350 g

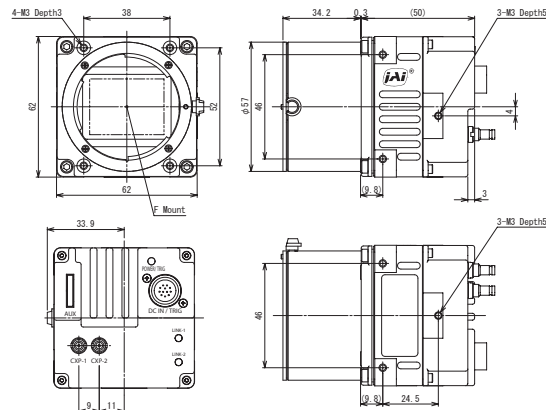
## Ordering Information

SP-20000M-CXP2	Monochrome camera with dual-channel CoaXPress
SP-20000C-CXP2	Color camera with dual-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.

†Reduced performance may occur when operating outside the standard range of -5°C to +45°C

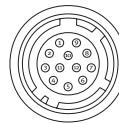
## Dimensions



Outside size tolerance ± 0.3mm

## Connector pin-out

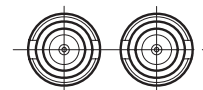
### DC In / Trigger



HIROSE HR10A-10R-12PB-01

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

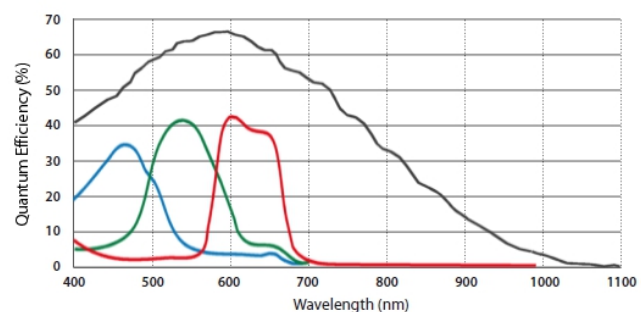
### CoaXPress Interface



CXP-1 CXP-2

One- or two-channel output  
Requires cable(s) with 75Ω 1.0/2.3 DIN-type connector  
Supports up to 6.25 Gbps per channel  
Power can be supplied on channel #1

## Spectral Response



Color response includes IR-cut filter

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Europe, Middle East & Africa  
Phone +45 4457 8888  
Fax +45 4491 3252

Asia Pacific  
Phone +81 45 440 0154  
Fax +81 45 440 0166

Americas  
Phone (Toll-Free) 1 800 445 5444  
Phone +1 408 383 0300



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