

SP-20000-CXP2
20-megapixel CMOS global shutter



- **Large format 20 MP CMOS imager (global shutter)**
- **30 fps at full resolution**
- **6.4 μm 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**
- **Built-in high dynamic range (HDR) mode**



Specifications for SP-20000-CXP2

Spark Series

Specifications	SP-20000-CXP2
Sensor	41 mm CMOS global shutter (CMV20000)
Pixel clock	40 or 20 MHz selectable
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
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 10 μs to 8 sec in 1 μs steps Auto shutter 1/30 to 1/100000 sec.
Auto Level Control (ALC)	Shutter range from 1/30 to 1/100000, 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

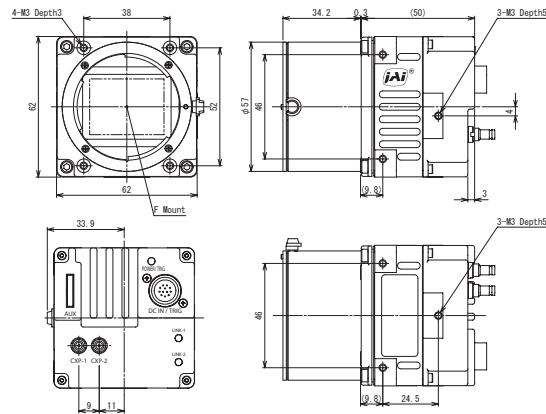
Ordering Information

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

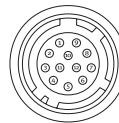
Dimensions



Outside size tolerance ± 0.3mm

Connector pin-out

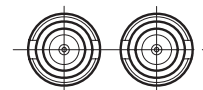
DC In / Trigger



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

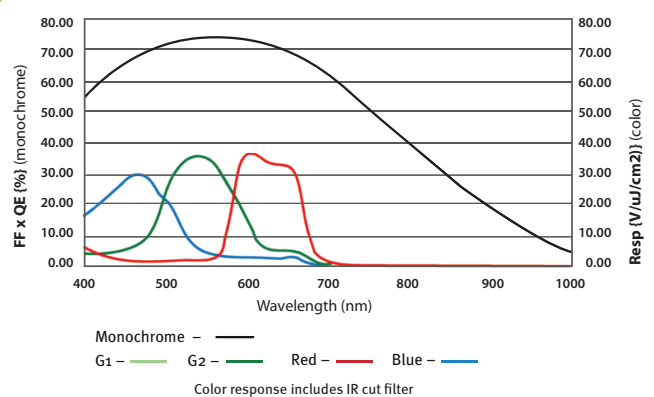
CoaXPress Interface



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



Monochrome —
G1 — G2 — Red — Blue —
Color response includes IR cut filter

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