

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 or M42 lens mounts**
- **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 or M42-mount |
| Dimensions (H x W x L) | 62 mm x 62 mm x 84.5 mm |
| Weight | 350 g |

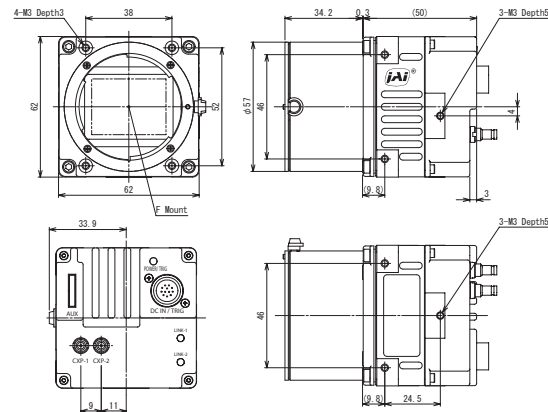
Ordering Information

| | |
|--------------------|---|
| SP-20000M-CXP2-F | Monochrome, dual-channel CoaXPress w/ F-mount |
| SP-20000C-CXP2-F | Color, dual-channel CoaXPress w/ F-mount |
| SP-20000M-CXP2-M42 | Monochrome, dual-channel CoaXpress w/ M42-mount |
| SP-20000C-CXP2-M42 | Color, dual-channel CoaXPress w/ M42-mount |

*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

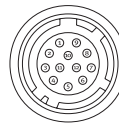
Dimensions



Outside size tolerance ± 0.3mm

Connector pin-out

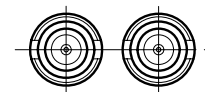
DC In / Trigger



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 |

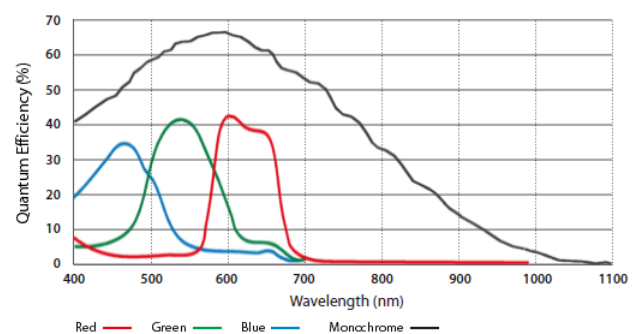
CoaXPress Interface



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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