SP-5000-USB

5-megapixel CMOS global shutter

USB3 VISION™

- *Large format 5 MP CMOS imager (global shutter)*
- *Up to 62 fps at full resolution*
- *5.0 µm square pixels in a 5:4 aspect ratio*
- *Monochrome or Bayer color models*
- *60 dB linear dynamic range with up to 100 dB piecewise HDR modes (monochrome only)*
- *Analog front-end gain control for reduced noise in low light images*
- *On-chip analog gain for individual R, G, + B control (color models)*
- *Exposure control from 10 µs (1/100,000) to 8 seconds in 1 µs steps*
- *ROI modes for flexible readout, windowing, or increasing frame rate*
- *Vertical and horizontal binning on monochrome model*
- *8/10-bit digital output over USB3 Vision interface*
- *C-mount lens mount*
- *Automatic Level Control (ALC) for dynamic lighting conditions*
- *Programmable P-iris lens control or 3-axis control for operation of motorized lenses, pan/tilt heads, or other analog accessories*

Specifications for SP-5000-USB

Spark Series

Specifications	SP-5000-USB
Sensor	1" CMOS global shutter
Pixel clock	48 MHz
Frame rate, full frame	62 frames/sec.
Active area	12.8 mm (h) x 10.2 mm (v), 16.39 mm diagonal
Cell size	5.0 µm (h) x 5.0 µm (v)
Active pixels	2560 (h) x 2048 (v)
Read-out modes Full ROI (mono) Binning	2560 (h) x 2048 (v) up to 62 fps 1 line to full frame height in 1-line steps, with X offset and width in 16-pixel steps 2 lines to full-frame height in 2-line steps, with X offset and width in 16-pixel steps 1x2, 2x1, 2x2 (monochrome only)
EMVA 1288 Parameters Absolute sensitivity (mono) Absolute sensitivity (color) Maximum SNR (mono) Maximum SNR (color)	10-bit output format 23.50 p (λ = 525 nm) 36.08 p (λ = 525 nm) 41.48 dB 38.00 dB
Traditional SNR* mono color	 >55 dB (0 dB gain) >53 dB (0 dB gain, green)
Video signal output mono color	 8/10-bit monochrome 8/10-bit raw Bayer
Auto-iris lens video output	0.7Vp-p, with 0.3V horiz. sync
Gain	Manual/automatic 0 dB to +24 dB
White balance (SP-5000C)	Manual, one-push auto, or continuous (3000K to 9000K)
Gamma	0.45-1.0 (8 steps) or 256-point LUT
Synchronization	Internal
Trigger input	Opto In, TTL In, Pulse Generators (2), Software, NAND 0, NAND 1
Trigger modes	EPS, PIV, Trigger Width, Timed RCT (with ALC), Sequence
Electronic shutter Timed exposure Auto shutter	 10 µs to 8 sec in 1 µs steps 1/62 to 1/100000 sec.
Auto Level Control (ALC)	Shutter range from 1/62 to 1/100000, gain range from 0 dB to +24 dB, auto iris control. Tracking speeds and max values adjustable.
High Dynamic Range function	4 built-in HDR slopes. Selectable up to ~100 dB.
Pre-processing functions	Flat field correction, color shading correction (SP-5000C), blemish compensation (512 pixels)
3-axis control	Programmable control of motorized lenses, pan/tilt heads, and other analog accessories
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%. 6.24W typical (full frame @ 12V)
Lens mount	C-mount (fixed or adjustable)
Dimensions (H x W x L)	62 mm x 62 mm x 55.5 mm
Weight	255 g

Ordering Information

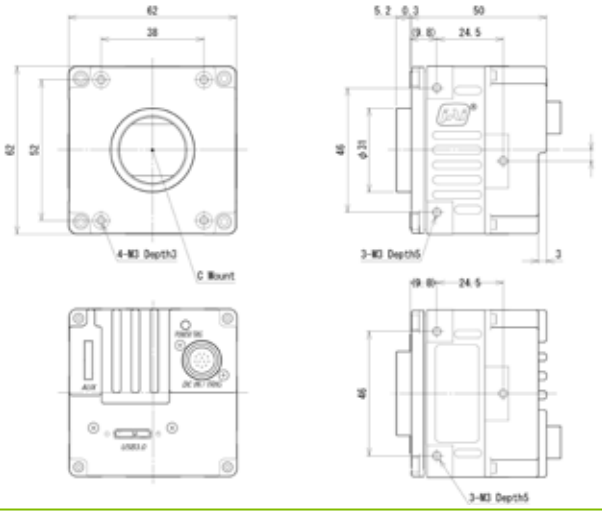
SP-5000M-USB	Monochrome camera with two-channel USB3 Vision
SP-5000C-USB	Color camera with two-channel USB3 Vision

*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 -10°C to +50°C

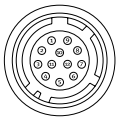
Note: add -CX to model number for adjustable C-mount

Dimensions



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

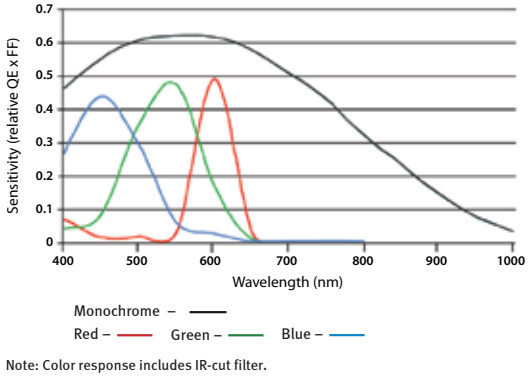
USB 3.0 Interface

Micro B type - ZX3600-B-10P or equiv.

No	I/O	Name	Note
1	I	VBUS IN	Power (VBUS)[1]
2	I/O	DM	USB2.0 Differential pair (-)[2]
3	I/O	DP	USB2.0 Differential pair (+)
4		OTG ID	USB OTG ID for identifying lines
5		GND	GND
6	O	FX3 SSTXM	USB3.0 Signal Transmission line (-)
7	O	FX3 SSTXP	USB3.0 Signal Transmission line (+)
8		GND	GND
9	I	FX3 SSRXP	USB3.0 Signal Receiving line (-)
10	I	FX3 SSRXM	USB3.0 Signal Receiving line (+)

[1] SP-5000-USB does not accept power over USB
[2] Does not work with USB 2.0

Spectral Response



Note: Color response includes IR-cut filter.

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