

❖ **SP-5000-PMCL**  
5-megapixel CMOS Global Shutter



- **Large format 5 MP CMOS imager (global shutter)**
- **Up to 137 fps at full resolution**
- **5.0  $\mu\text{m}$  square pixels in a 5:4 aspect ratio**
- **60 dB linear dynamic range with up to 84 dB piece-wise HDR modes**
- **Analog and digital gain control for less quantized noise in low-light situations**
- **Exposure control from 10  $\mu\text{s}$  (1/100,000) to 8 seconds in 1  $\mu\text{s}$  steps**
- **2X binning for increased sensitivity (monochrome only)**
- **ROI modes for flexible readout, windowing, or increasing frame rate**
- **Monochrome or raw Bayer color models**
- **Accepts power over Mini Camera Link or 12-pin connector for maximum application flexibility**
- **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-PMCL

# Spark Series

Specifications	SP-5000-PMCL
Sensor	1" CMOS global shutter
System clock	72 MHz (for pulse generator)
Frame rate, full frame	137 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)
Horizontal output frequency	47.989 kHz to 290.763 kHz depending on tap geometry and CL clock frequency
Read-out modes	<p>Full ROI (mono) 2560 (h) x 2048 (v) up to 137 fps Any start line, any height in 1 line steps, with X offset and width in 16 pixel steps</p> <p>ROI (RGB) Any start line, any height, in 2L steps with X offset and width in 16 pixel steps</p> <p>Binning 1x2, 2x1, 2x2 (monochrome only)</p>
EMVA 1288 Parameters	10-bit output format
Absolute sensitivity (mono)	23.50 p (λ = 525 nm)
Absolute sensitivity (color)	36.08 p (λ = 525 nm)
Maximum SNR (mono)	41.48 dB
Maximum SNR (color)	38.00 dB
Traditional SNR*	<p>mono &gt;55 dB (0 dB gain)</p> <p>color &gt;53 dB (0 dB gain, green)</p>
Video signal output	<p>mono 8/10/12-bit monochrome</p> <p>color 8/10/12-bit Bayer</p>
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	TTL, CL, Pulse Generators (4), Software, NANDo, NAND1
Trigger modes	EPS, PIV, Trigger Width, Timed RCT (with ALC)
Electronic shutter	<p>Timed exposure 10 μs to 8 sec in 1 μs steps</p> <p>Auto shutter 1/137 to 1/100000 sec.</p>
Auto Level Control (ALC)	Shutter range from 1/137 to 1/100000, gain range from 0 dB to +24 dB, auto iris control Tracking speeds and max values adjustable.
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%. 4.5W 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	215 g

\*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

## Ordering Information

SP-5000M-PMCL	Monochrome camera with Mini Camera Link
SP-5000C-PMCL	Color camera with Mini Camera Link

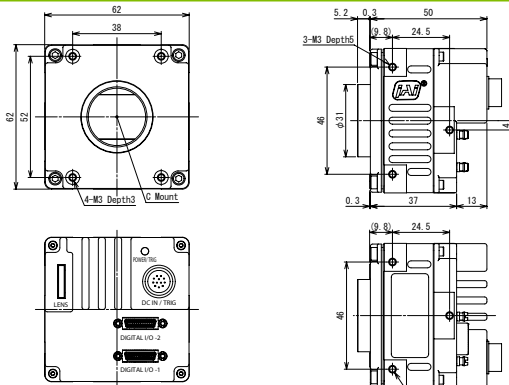
Note: Add -CX to model number for adjustable C-mount

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

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

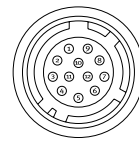
**Americas**  
Phone (Toll-Free) 1 800 445 5444  
Phone +1 408 383 0300

## Dimensions



## Connector pin-out

### DC In / Trigger

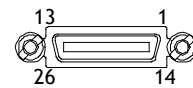


HIROSE HR10A-10R-12PB-01

### Connector Pin-out

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

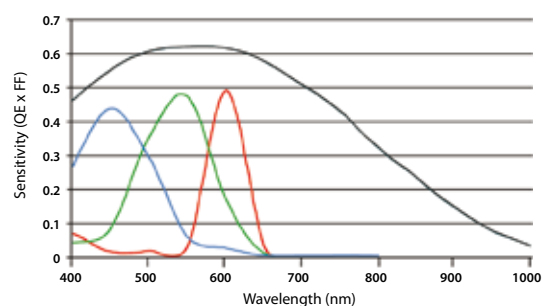
### Mini-CL interface Interface 1



Pin	Signal	Function	
1	26	Power	+12V ± 1V DC in
13	14	GND	Power return
2	15	-/+ TxOUT 0	CL Video Channel 1
3	16	-/+ TxOUT 1	
4	17	-/+ TxOUT 2	
5	18	-/+ TxClk	Serial in
6	19	-/+ TxOUT 3	
7	20	+/- RXD	
8	21	-/+ TXD	Serial out
9	22	CC1-/CC1+	Ext. trigger
10	23	CC2+/CC2-	Not used
11	24	CC3-/CC3+	Not used
12	25	CC4+/CC4-	Not used

For Medium and Full implementations a second Mini-CL interface is provided. Video Channel 2 is on pin pairs (2,15), (3,16), (4,17), (5,18), and (6,19). Video Channel 3 is on pin pairs (8,21), (9,22), (10,23), (11,24), and (12,25). Consult manual for Specific bit depths and pin assignments.

## Spectral Response



Note: Color response includes IR-cut filter.

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