

# SP-5000C-PMCL

## Technical Datasheet

Lince5M



See the possibilities

## Apex Series



Spark Series area scan cameras are the perfect choice for machine vision applications demanding high quality images with the highest possible throughput. They feature the latest CMOS imagers delivering high resolution images at speeds as much as 10 times faster than traditional CCD cameras.

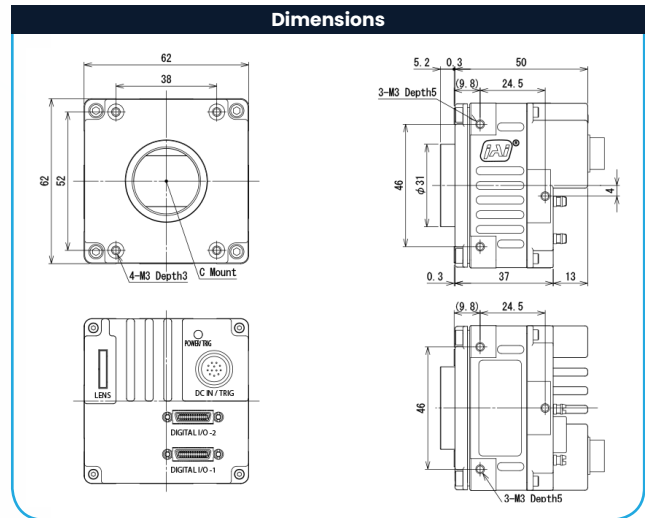
For example, 45-megapixel (MP) models can deliver over 50 fps output while some 5-MP models run at 250 fps or more. Using the region-of-interest (ROI) feature, even higher frame rates can be achieved.

### Specification Highlights

<b>SENSOR:</b>	Lince5M	<b>SHUTTER:</b>	Global Shutter
<b>FORMAT:</b>	1"	<b>FRAME RATE:</b>	137 fps
<b>PIXEL SIZE:</b>	5.0 x 5.0 $\mu$ m	<b>INTERFACE:</b>	Mini Camera Link (PoCL)
<b>LENS MOUNT:</b>	C-Mount	<b>RESOLUTION MP:</b>	5 MP
<b>SPECTRUM:</b>	Color (Visible)	<b>RESOLUTION WxH:</b>	2560 x 2048 px

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		
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
ROI (RGB)		Any start line, any height, in 2L steps with X offset and width in 16 pixel steps
Binning		1x2, 2x1, 2x2 (monochrome only)
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*	mono color	>55 dB (0 dB gain) >53 dB (0 dB gain, green)
Video signal output	mono color	8/10/12-bit monochrome 8/10/12-bit 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 (16 steps) or 256-point LUT
Synchronization		Internal
Trigger input		TTL, CL, Pulse Generators (4), Software, NAND0, NAND1
Trigger modes		EPS, PIV, Trigger Width, Timed RCT (with ALC)
Electronic shutter		
Timed exposure		10 μs to 8 sec in 1 μs steps
Auto shutter		1/250 to 1/100000 sec.
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 <sup>†</sup>
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
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



### Connector pin-out

#### DC In / Trigger

HIROSE HR10A-10R-12PB-01

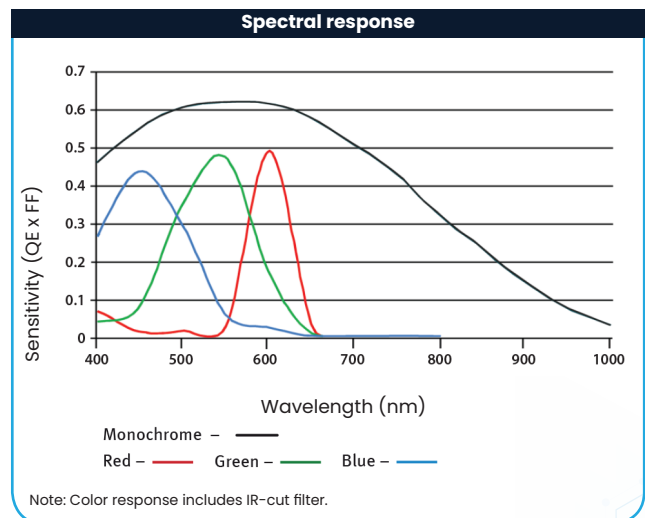
Connector Pin-out

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
3	16	-/+ TxOUT 1
4	17	-/+ TxOUT 2
5	18	-/+ TxClk
6	19	-/+ TxOUT 3
7	20	+/- RXD Serial in
8	21	-/+ TXD Serial out
9	22	CC1-/CC1+ Ext. trigger
10	23	CC2+/CC2- Not used
11	24	CC3-/CC3+ Not used
13	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.*



\*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.  
<sup>†</sup>Reduced performance may occur when operating outside the standard range of -5°C to +45°C

## Product Highlights

- 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

## Additional Product Images



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