

❖ **SP-20000-PMCL**  
20-megapixel CMOS global shutter



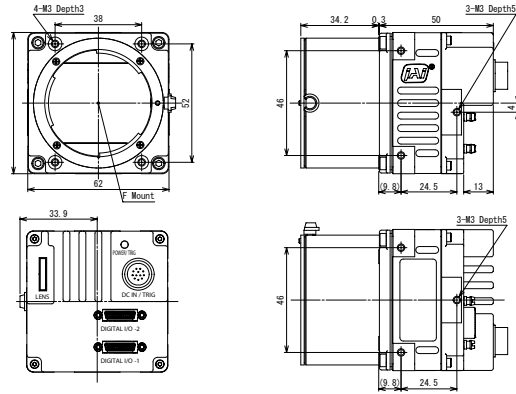
- **Large format 20 MP CMOS imager (global shutter)**
- **30 fps at full resolution**
- **6.4  $\mu\text{m}$  square pixels**
- **User-selectable ROI**
- **Vertical and horizontal binning**
- **Flat-field and blemish compensation plus in-camera CMOS pattern correction**
- **CMOS imager includes correlated double sampling (CDS) function for improved uniformity**
- **8/10/12-bit digital output over two-channel Mini Camera Link interface**
- **Accepts power over Mini Camera Link connectors (PMCL) or via 12-pin connector for maximum application flexibility**
- **Monochrome or color models with raw Bayer or in-camera RGB/YUV interpolation**
- **F-mount lens mount**
- **Automatic Level Control (ALC) for dynamic lighting conditions**
- **Programmable 3-axis control for motorized lenses, pan/tilt heads, and other analog accessories, with optional P-iris lens control**

# Specifications for SP-20000-PMCL

# Spark Series

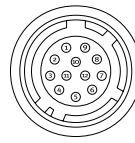
Specifications	SP-20000-PMCL
Sensor	41 mm diag. CMOS global shutter (CMV20000)
Pixel Clock	40 MHz
Frame rate, full frame	30 frames/sec.
Active area	32.77 mm (h) x 24.58 mm (v), 41 mm diagonal
Cell size	6.4 μm (h) x 6.4 μm (v)
Active pixels	5120 (h) x 3840 (v)
Horizontal output frequency	62.402 kHz
Read-out modes	5120 (h) x 3840 (v) 30 fps
Full ROI (mono)	Any start line/pixel, any height, any width in 1 line/1 pixel steps
ROI (color)	Any start line, any height, in 2L steps
Binning	1x2, 2x1, 2x2 (monochrome only)
Sensitivity (SP-20000M)	0.88 Lux (shutter off, max. gain, f1.4, 50% video)
Sensitivity (SP-20000C)	1.18 Lux (shutter off, max. gain, f1.4, 50% green)
S/N ratio	mono >53 dB. (0 dB gain) color >51 dB. (0 dB gain, green)
Video signal output	8/10/12-bit monochrome, Bayer color, or RGB/YUV
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 (16 steps) or 256-point LUT
Synchronization	Internal
Inputs/Outputs	GPIO in/out through Hirose 12-pin connector
Trigger input	Line1 (TTL in), function generators 1-4, CC1 (Camera Link), SW1
Trigger modes	EPS, PIV, Trigger Width, RCT (with ALC)
Electronic shutter	
Timed exposure	100 μs to 8 sec in 1 μs steps
Auto shutter	1/30 to 1/10,000 sec.
Auto level control (ALC)	Shutter range from 1/30 to 1/10,000, 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-20000C), blemish compensation (>2000 pixels)
3-axis control	Programmable control of motorized lenses, pan/tilt heads, and other analog accessories
Operating temperature	-5° C to +45° C
Storage temperature	-45° C to +70° C
Humidity	20 - 80% non-condensing
Vibration	10G (20 Hz to 200 Hz XYZ)
Shock	80 G
Regulations	CE (EN 61000-6-2, EN 61000-6-3), FCC part 15 class B, RoHS/WEEE
Power	12V to 24V DC ± 10%. 5.4W typical (full frame @ 12V)
Lens mount	F-mount
Dimensions (H x W x L)	62 mm x 62 mm x 84.5 mm
Weight	F-mount 320 g

## Dimensions



## Connector pin-out

### DC In / Trigger



HIROSE HR10A-10R-12PB-01

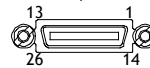
Pin	Function
1	GND
2	+12V to +24V DC input
3	Opto in 2(-)/GND
4	Opto in 2(+)* / Auto iris lens
5	Opto in 1(-)
6	Opto in 1(+)

### Connector Pin-out

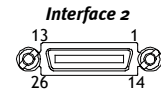
Pin	Function
7	Opto out 1(-)
8	Opto out 1(+)
9	Opto out 2(-)
10	Opto out 2(+)
11	+12V to +24V DC input
12	GND

\* Pins 3 and 4 can be configured by internal switch selection

### Interface 1



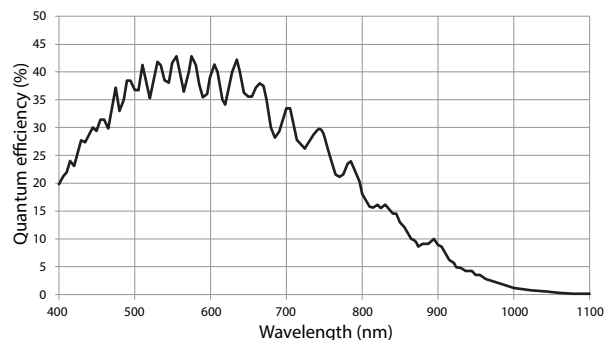
### Mini-CL interface



Pin	Signal	Function
1	GND	DC +12V on PMCL
13	GND	For #26 pin on PMCL
14	GND	For #1 pin on PMCL
26	GND	DC +12V on PMCL
2	15 -/+ TxOUT 0	CL Video Channel X
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. trig
10	23 CC2-/CC2-	Not used
11	24 CC3-/CC3+	Not used
12	25 CC4-/CC4-	Not used

Pin	Signal	Function
1	14 GND	DC +12V on PMCL
13	26 GND	For #26 pin on PMCL
2	15 -/+ TxOUT 0	CL Video Channel Y
3	16 -/+ TxOUT 1	
4	17 -/+ TxOUT 2	
5	18 -/+ TxClk	
6	19 -/+ TxOUT 3	
7	20 +/- RXD	Not used
8	21 -/+ TxOUT 0	CL Video Channel Z
9	22 -/+ TxOUT 1	
10	23 -/+ TxOUT 2	
11	24 -/+ TxClk	
12	25 -/+ TxOUT 3	

## Spectral Response



Monochrome —  
\* Red — Green — Blue —

\* Color spectral response not yet available

## Color Interpolation (in-camera)

RGB	4.1 fps (24/30/36-bit)
YUV	7.8 fps (4:1:1), 5.8 fps (4:2:2)

## Ordering Information

SP-20000M-PMCL-F	Monochrome camera with Mini Camera Link & F-mount
SP-20000C-PMCL-F	Color camera with Mini Camera Link & F-mount

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