

❖ **SP-20000-PMCL**
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 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 output**
- **F-mount or M42 lens mount**
- **Automatic Level Control (ALC) for dynamic lighting conditions**

*Some video processing functions not available with 12-bit output



Specifications for SP-20000-PMCL

Spark Series

Specifications	SP-20000-PMCL
Sensor	41 mm diag. 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	11.37 kHz to 122.2 kHz depending on tap geometry and CL clock frequency
Read-out modes	Full ROI 5120 (h) x 3840 (v) @ 30 fps Any start position. 8-5120 pixels wide 2-3840 lines high Width in 8 pixels/step Height in 1 line/step (mono) or 2 lines/step (color)
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 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, CL, Pulse Generators (4), Software, NANDØ, NAND1
Trigger modes	EPS, PIV, Trigger Width, RCT (with ALC)
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, auto iris control Tracking speeds and max values adjustable
Pre-processing functions	Flat field correction, color shading correction (SP-20000C), blemish compensation (1000 pixels)
Operating temperature	-45° C to +70° 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 or M42 mount with 16 mm flange back distance
Dimensions (H x W x L)	62 mm x 62 mm x 84.5 mm
Weight	F-mount 320 g

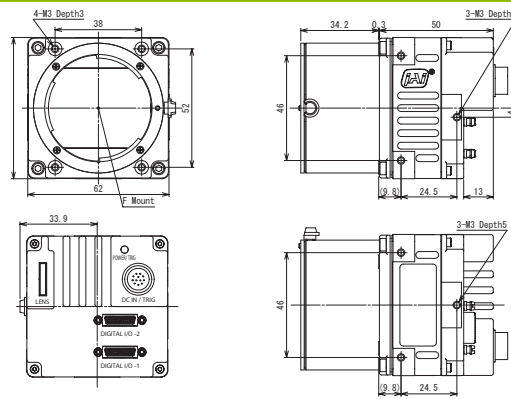
Ordering Information

SP-20000M-PMCL-F	Monochrome with Mini Camera Link & F-mount
SP-20000C-PMCL-F	Color with Mini Camera Link & F-mount
SP-20000M-PMCL-M42A	Monochrome with Mini Camera Link & M42 mount
SP-20000C-PMCL-M42A	Color with Mini Camera Link & 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.

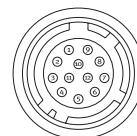
†Reduced performance may occur when operating outside the standard range of -5°C to +45°C

Dimensions



Connector pin-out

DC In / Trigger

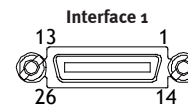


HIROSE HR10A-10R-12PB-01

Connector Pin-out

Pin 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

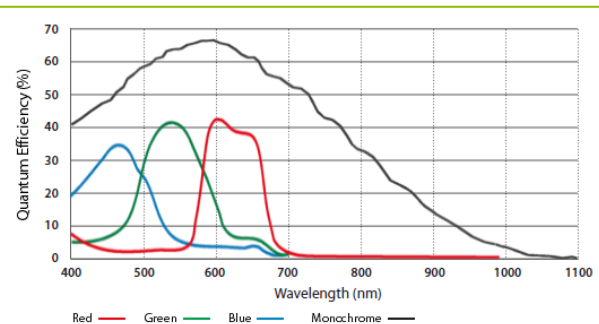
Mini-CL interface



Pin	Signal	Function
1	26	Power +12V to +24V DC in
13	14	GND Power return
2	15	-/+ TxOUT 0
3	16	-/+ TxOUT 1
4	17	-/+ TxOUT 2 CL Video Channel 1
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
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



Color response includes IR-cut filter

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