SP-12400M-PMCL
Technical Datasheet

IMX253

jAi ®

See the possibilities

**CAMERA Link** ®

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

SENSOR:	IMX253		**SHUTTER:**	Global Shutter
FORMAT:	1.1"		**FRAME RATE:**	64 fps
PIXEL SIZE:	3.45 x 3.45 μm		**INTERFACE:**	Mini Camera Link
LENS MOUNT:	C-Mount		**RESOLUTION MP:**	12.4 MP
SPECTRUM:	Monochrome (Visible + NIR)		**RESOLUTION WxH:**	4112 x 3008 px

Specifications	SP-12400-PMCL
Sensor	1.1" CMOS global shutter (IMX253)
Active pixels	4112 x 3008 or 4080 x 3008, depending on tap geometry
Frame rate, full frame	64.6 frames/sec. @ 8-bit (1x10_1Y)
Active area	14.2 mm (h) x 10.4 mm (v) - 17.6 mm diagonal
Pixel size	3.45 µm x 3.45 µm
Camera Link clock	37.1 / 74.3 / 84.9 MHz
System clock	74.25 MHz (for pulse generator)
Read-out modes Full ROI (single)) ROI (multi))	 4112 (h) x 3008 (v) up to 64.6 fps H: 96 to 4112 pixels in 16 pixel steps V: 8 to 3008 lines in 4 line steps Up to 64 areas can be defined (non-overlapping).
Binning	1x2, 2x1, 2x2 (monochrome only)
EMVA 1288 Parameters Absolute sensitivity Maximum SNR	10-bit output format Mono: 3.50 p Color: 4.00 p (λ = 525 nm) Mono: 40.03 dB Color: 40.10 dB
Traditional SNR*	>60 dB (0 dB gain, 10-bit)
Video signal output	Monochrome: 8/10/12-bits† Color: 8/10/12-bit Bayer†
Video modes	Normal/ROI, Multi ROI, Sequencer (2)
Gain	Manual/auto 0 dB to +24 dB
White balance	Off, 4 presets (3200K, 5000K, 6500K, 7500K), or one-push/continuous AWB (3000K to 9000K)
Gamma/LUT	0.45 to 1.0 (9 steps) or 257-point programmable LUT
Shading correction	Flat shading, color shading
Trigger input	TTL, Camera Link (CC1), Opto In (2), Pulse Generators (4), Software, NAND Out (2), User Output (4)
Exposure modes	Timed/EPS, RCT, Trigger Width, Auto
Electronic shutter	Electronic shutter
Auto Level Control (ALC)	Shutter range from 100 µs to 1/frame rate, gain range from 0 dB to +24 dB. Tracking speeds and max. values adjustable.
Pre-processing functions	Edge enhancer, blemish compensation (800 pixels)
Operating temp. (ambient)	-5ºC to +45ºC (20 to 80% non-condensing)
Storage temp. (ambient)	-25ºC to +60ºC (20 to 80% non condensing)
Vibration	10G (20 Hz to 200 Hz, XYZ directions)
Shock	80G
Regulations	CE (EN61000-6-2, EN61000-6-3) FCC Part 15 Class B, RoHS/WEEE
Power	12-pin PoCL	+12V to +24V DC ± 10%. 5.1 W typical @ +12 V +10V to +13 V DC. 5.2 W typical @ +12 V
Lens mount	C-mount
Dimensions (H x W x L)	44 mm x 44 mm x 44 mm (excl. connectors)
Weight	135 g

Ordering Information	
SP-12400M-PMCL SP-12400C-PMCL	Monochrome camera with Camera Link Color camera with Camera Link

Dimensions

Outside size tolerance ± 0.3 mm
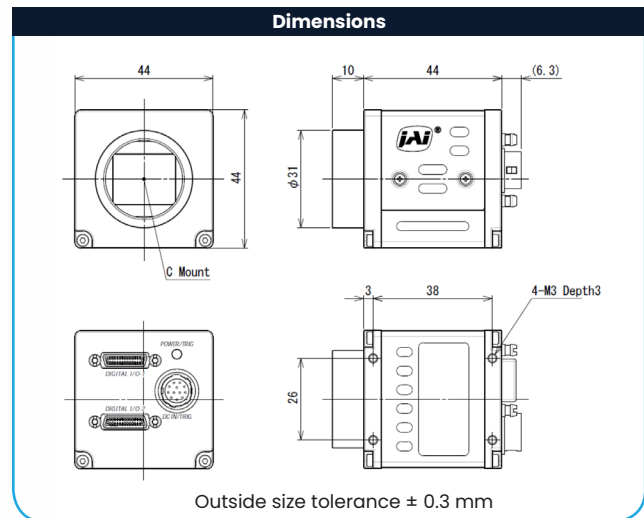
Connector pin-out

DC In / Trigger
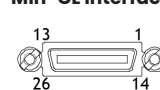

HIROSE HR10A-10R-12PB(71)

Connector Pin-out

Pin	-
1	Ground
2	DC in +12V to +24V
3	Opto In 2-
4	Opto In 2+
5	Opto In 1-
6	Opto In 1+
7	Opto Out 1-
8	Opto Out 1+
9	TTL out 1
10	-
11	DC in +12V to +24 V
12	Ground

Min-CL Interface

Pin		Signal	Function
1	26	Power	-
2	15	X0-/X0+	CL Data
3	16	X1-/X1+	CL Data
4	17	X2-/X2+	CL Data
5	18	Xclk-/Xclk+	CL Clk
6	19	X3-/X3+	CL Data
7	20	SerTC+/SerTC-	Serial in
8	21	SerTFG-/SerTFG+	Serial out
9	22	CC1-/CC1+	Trigger*
10	23	CC2-/CC2+	Reserved
11	24	CC3-/CC3+	Not used
12	25	CC4-/CC4+	Not used
13	14	GND	-

*Via Camera Link or 12-pin/10-pin connectors
Note:
Camera Link Base confguration shown. For other configurations, refer to Camera Link specifications or operation manual.

Spectral response
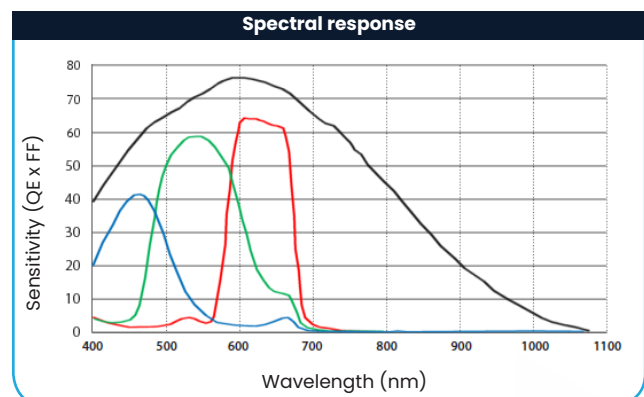
*Traditional SNR is based on random noise in a single frame, where EMVA SNR measurements consider more comprehensive noise sources and variance over time.

†12-bit output available in video processing bypass mode. See manual for details.

Product Highlights

- High resolution 12-megapixel CMOS imager (global shutter)
- 64.6 fps at full resolution
- 3.45 μm square pixels
- User selectable ROI and multi-ROI functions
- Horizontal and vertical binning (monochrome model) for increased sensitivity
- Edge enhancement function
- Shading/blemish compensation, gamma correction, lookup table and more
- Excellent shock and vibration resistance
- 8/10/12-bit* output over GenICam-compliant Camera Link 2.0 interface
- Supports power over Camera Link or via separate 12-pin connector
- C-mount lens mount

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

Additional Product Images