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SP-12401C-USB

Technical Datasheet

See the possibilities

IMX305

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:	IMX305	**SHUTTER:**	Global Shutter
FORMAT:	1.1"	**FRAME RATE:**	23 fps
PIXEL SIZE:	3.45 x 3.45 µm	**INTERFACE:**	USB3 Vision (PoUSB)
LENS MOUNT:	C-Mount	**RESOLUTION MP:**	12.4 MP
SPECTRUM:	Color (Visible)	**RESOLUTION WxH:**	4088 x 3000 px

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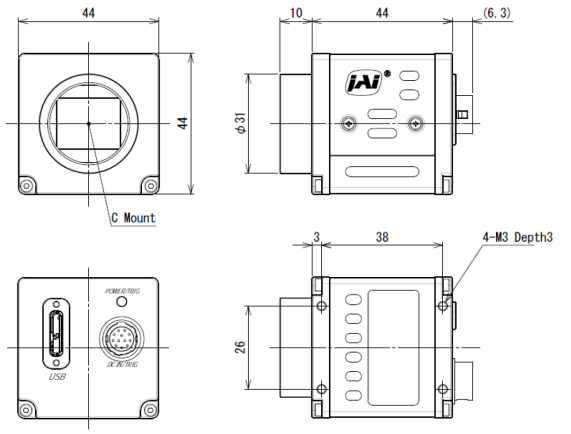
Specifications	SP-12401-USB
Sensor	1.1" CMOS global shutter (IMX304)
Active pixels	Monochrome: 4112 (h) x 3008 (v) Color: 4088 (h) x 3000 (v)
Frame rate, full frame	23.4 frames/sec. @ 8-bit
Active area	14.2 mm (h) x 10.4 mm (v) - 17.6 mm diagonal
Pixel size	3.45 µm x 3.45 µm
System clock	74.25 MHz (for pulse generator)
Read-out modes	
Full ROI (single)	4112/4088 (h) x 3008/3000 (v) up to 23.4 fps H: 16 to 4112/4088 pixels in 16 pixel steps V: 8 to 3008/3000 lines in 4 line steps
ROI (multi))	Up to 5 overlapping scanning areas can be defined.
Binning	1x2, 2x1, 2x2
EMVA 1288 Parameters Absolute sensitivity Maximum SNR	12-bit output format Mono: 3.39 p Color: 3.76 p (λ = 525 nm) Mono: 40.02 dB Color: 40.18 dB
Traditional SNR*	>60 dB (0 dB gain, 10-bit)
Video signal output	Monochrome: 8/10/12-bits† Color: 8/10/12-bit Bayer or 24/30-bit RGB†
Video modes	Normal, Single ROI, Multi ROI, Sequencer
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	Opto In (2), Pulse Generators (4), Software, NAND Out (2), User Output (4)
Exposure modes	Timed/EPS, Trigger Width, RCT, Auto
Electronic shutter	Timed: 15.26 µs to 8 s Trigger width: 15.26 µs to ∞ s
Auto level control (ALC)	Shutter range from 100 µs to 107.5 ms, gain range from 0 dB to +24 dB. Tracking speeds and max. values adjustable.
Pre-processing functions	Color enhancer, edge enhancer, color space conversion (RGB to HSI, XYZ, sRGB, Adobe RGB), 5x5 de-Bayering, blemish compensation (800 pixels)
Synchronization	Synchronization
Operating temp. (ambient)	-5°C to +45°C (20 to 80% non-condensing)
Storage temp. (ambient)	-25°C to +60°C (20 to 80% non condensing)
Vibration	10G (20 Hz to 200 Hz, XYZ directions)
Shock	80 G
Regulations	CE (EN61000-6-2, EN61000-6-3) FCC Part 15 Class B, RoHS/WEEE
Power — 12-pin	+12V to +24V DC ± 10%. 3.7 W typical @ +12 V
Power — USB bus power	Not supported
Lens mount	C-mount
Dimensions (H x W x L)	44 mm x 44 mm x 44 mm (excl. connectors)
Weight	130 g
Ordering Information	
SP-12401M-USB	Monochrome camera with USB3 Vision
SP-12401C-USB	Color camera with USB3 Vision

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

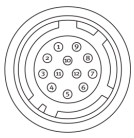
Dimensions



Outside size tolerance ± 0.3 mm

Connector pin-out

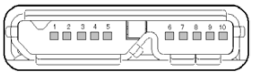
DC In / Trigger



HIROSE HR10A-10R-12PB(71)

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

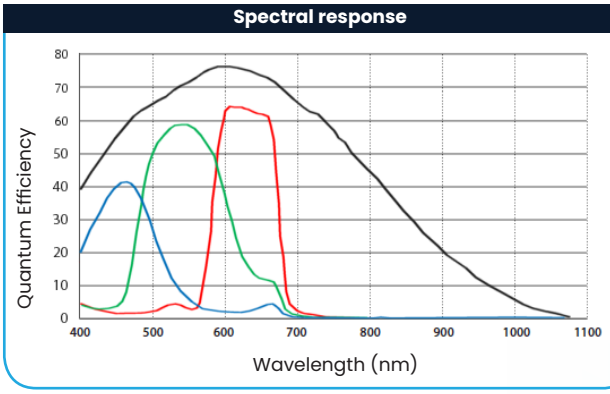
GigE Vision Interface



Micro B type - ZX3600-B-10P or equiv.

No	I/O	Name	Note
1	I	VBUS IN	Power (VBUS)
2	I/O	DM	USB2.0 Differential pair (-)
3	I/O	DP	USB2.0 Differential pair (+)
4	-	OTG ID	USB OTG ID for identifying lines
5	-	GND	GND
6	O	FX3 SSTXM	USB3.0 Signal Transmission line (-)
7	O	FX3 SSTXP	USB3.0 Signal Transmission line (+)
8	-	GND	GND
9	I	FX3 SSRXP	USB3.0 Signal Receiving line (-)
10	I	FX3 SSRXM	USB3.0 Signal Receiving line (+)

Spectral response



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

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Product Highlights

- High resolution 12-megapixel CMOS imager (global shutter)
- 23.4 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
- Color model provides raw Bayer output or 5x5 in-camera color interpolation
- Edge enhancement function
- Color enhancer and RGB/HSI/XYZ color space conversion functions on color model
- Excellent shock and vibration resistance
- 8/10/12-bit* output over USB3 Vision interface
- C-mount lens mount

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

Additional Product Images