

# SP-12401C-PGE

## Technical Datasheet

IMX304



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.

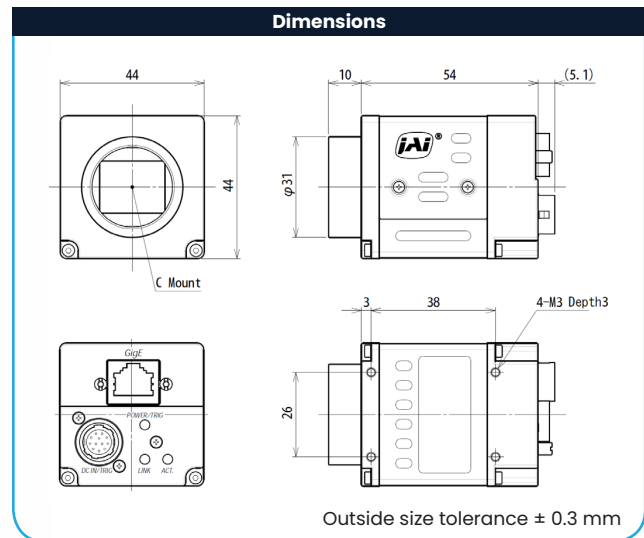
### Specification Highlights

<b>SENSOR:</b>	IMX304	<b>SHUTTER:</b>	Global Shutter
<b>FORMAT:</b>	1"	<b>FRAME RATE:</b>	9 fps
<b>PIXEL SIZE:</b>	3.45 x 3.45 $\mu$ m	<b>INTERFACE:</b>	GigE Vision 1-Cable (PoE)
<b>LENS MOUNT:</b>	C-Mount	<b>RESOLUTION MP:</b>	12.4 MP
<b>SPECTRUM:</b>	Color (Visible)	<b>RESOLUTION WxH:</b>	4088 x 3000 px

Specifications		SP-12401-PGE
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		9.3 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 9.3 fps H: 16 to 4112/4088 pixels in 16 pixel steps V: 2 to 3008/3000 lines in 2 line steps
ROI (multi)		Up to 5 overlapping scanning areas can be defined.
Binning		1x2, 2x1, 2x2
EMVA 1288 Parameters		12-bit output format
Absolute sensitivity		Mono: 3.47 p Color: 4.15 p (λ = 525 nm)
Maximum SNR		Mono: 40.09 dB Color: 40.27 dB
Traditional SNR*		>60 dB (0 dB gain, 10-bit)
Video signal output		Monochrome: 8/10/12-bits <sup>†</sup> Color: 8/10/12-bit Bayer or 24/30-bit RGB <sup>†</sup>
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, Burst, 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)
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		80G
Regulations		CE (EN61000-6-2, EN61000-6-3) FCC Part 15 Class B, RoHS/WEEE
Power	12-pin PoE	+12V to +24V DC ± 10%. 4.0 W typical @ +12 V +36V to +57 V DC. 5.1 W typical @ +48 V
Lens mount		C-mount
Dimensions (H x W x L)		44 mm x 44 mm x 54 mm (excl. connectors)
Weight		160 g
Ordering Information		
SP-12401M-PGE		Monochrome camera with GigE Vision
SP-12401C-PGE		Color camera with GigE 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.

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

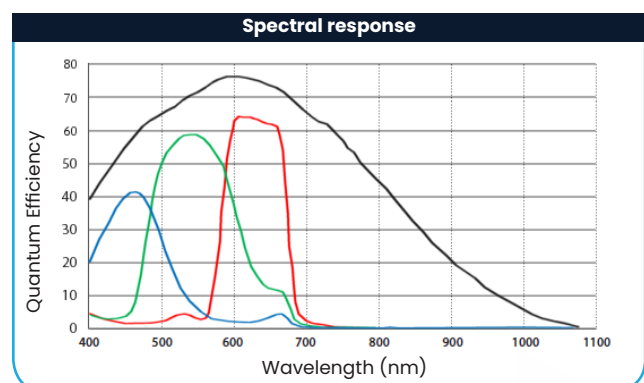


### Connector pin-out

HIROSE HR10A-10R-12PB(71)

RJ-45 with locking screws

Pin	-	Pin	Signal
1	Ground	1	TRD+(0)
2	DC in +12V to +24V	2	TRD-(0)
3	Opto In 2-	3	TRD+(1)
4	Opto In 2+	4	TRD+(2)
5	Opto In 1-	5	TRD-(2)
6	Opto In 1+	6	TRD-(1)
7	Opto Out 1-	7	TRD+(3)
8	Opto Out 1+	8	TRD-(3)
9	TTL out 1		
10	-		
11	DC in +12V to +24 V		
12	Ground		



## Product Highlights

- High resolution 12-megapixel CMOS imager (global shutter)
- 9.3 fps at full resolution
- 3.45  $\mu\text{m}$  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 GenICam-compliant GigE Vision 2.0 interface
- C-mount lens mount

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

## Additional Product Images



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