

■ 4112 x 3008

■ 23 fps

Spark Series  

❖ **SP-12401-USB**
12.4 megapixel CMOS area scan

USBTM
VISION



- **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

Specifications for SP-12401-USB

Spark Series

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) Binning Up to 5 overlapping scanning areas can be defined. 1x2, 2x1, 2x2
EMVA 1288 Parameters	12-bit output format
Absolute sensitivity	Mono: 3.39 p Color: 3.76 p (λ = 525 nm)
Maximum SNR	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	Internal
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 USB bus power +12V to +24V DC ± 10%. 3.7 W typical @ +12 V 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.

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Dimensions

Outside size tolerance ± 0.3 mm

Connector pin-out

DC In / Trigger

HIROSE HR10A-10R-12PB(71)

Pin	Description
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

USB3 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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See the possibilities