







- IMX421 CMOS sensor
- ALVIUM image processing
- USB3 Vision
- Various hardware options

Model without hardware options

Alvium 1800 U – Your entry into high-performance imaging

Industrial USB cameras with attractive price-performance ratio

Alvium 1800 U-291 with Sony IMX421 runs 141.0 frames per second at 2.9 MP resolution.

Alvium 1800 U is your entry into high-performance imaging with ALVIUM® Technology for industrial applications. Equipped with the newest generation of sensors, these small and lightweight cameras deliver high image quality and frame rates at the best price-performance ratio. With its USB3 Vision compliant interface and industrial-grade hardware, it is your workhorse for different machine vision applications whether it is on a PC-based or an embedded system.

Easy software integration with Allied Vision's Vimba Suite and compatibility to the most popular third party image-processing libraries.

See the Alvium Cameras Hardware Options for lens mount and housing options, as well as the Customization and OEM Solutions webpage for additional options.

Specifications

	Alvium 1800 U-291	
Interface	USB3 Vision	
Resolution	1944 (H) × 1472 (V)	
Spectral range	300 to 1100 nm	



Sensor type CMOS Shutter mode Global shutter Sensor size Type 2/3 Pixel size 4.5 µm × 4.5 µm Lens mounts (available) C-Mount Max. frame rate at full resolution 141 fps at 450 MByte/s, Mono8 ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) 1024 KByte Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/OS 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU			
Sensor type CMOS Shutter mode Global shutter Sensor size Type 2/3 Pixel size 4.5 µm × 4.5 µm Lens mounts (available) C-Mount Max. frame rate at full resolution 141 fps at 450 MByte/s, Mono8 ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) 1024 KByte Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/OS 4 programmable GPIOs Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /		Alvium 1800 U-291	
Shutter mode Global shutter Sensor size Type 2/3 Pixel size 4.5 µm × 4.5 µm Lens mounts (available) C-Mount Max. frame rate at full resolution 141 fps at 450 MByte/s, Mono8 ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) 1024 KByte Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/OS 4 programmable GPIOS Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU Regulations	Sensor	Sony IMX421	
Sensor size Type 2/3 Pixel size 4.5 μm × 4.5 μm Lens mounts (available) C-Mount Max. frame rate at full resolution ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12p, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/OS 4 programmable GPIOs Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Sensor type	CMOS	
Pixel size 4.5 μm × 4.5 μm Lens mounts (available) C-Mount Max. frame rate at full resolution 141 fps at 450 MByte/s, Mono8 ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) 1024 KByte Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/OS 4 programmable GPIOS Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 Regulations A.5 μm × 4.5 μm A.5 μm × 4.5 μm A.5 μm × 4.5 μm A.6 μπ × μπ × μπ A.6 μπ × μπ × μπ A.6 μπ × μπ × μπ A.6 μπ ×	Shutter mode	Global shutter	
Lens mounts (available) C-Mount Max. frame rate at full resolution ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) 1024 KByte Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 Regulations Regulations	Sensor size	Type 2/3	
Max. frame rate at full resolution ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) 1024 KByte Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/OS 4 programmable GPIOS Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Pixel size	4.5 μm × 4.5 μm	
ADC 12 Bit Image buffer (RAM) 256 KByte Non-volatile memory (Flash) 1024 KByte Toutput Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 Regulations 20 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Lens mounts (available)	C-Mount	
Image buffer (RAM) Non-volatile memory (Flash) 1024 KByte Output Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 Regulations Regulations	Max. frame rate at full resolution	141 fps at 450 MByte/s, Mono8	
Non-volatile memory (Flash) Dutput Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 Regulations Abaptive (10-bit, 12-bit) Bit Abaptive (10-bit, 12-bit) Bit Wono12p Mono12p M	ADC	12 Bit	
Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Image buffer (RAM)	256 KByte	
Bit depth 8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Non-volatile memory (Flash)	1024 KByte	
Monochrome pixel formats Mono8, Mono10, Mono10p, Mono12, Mono12p YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Output		
YUV color pixel formats YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Bit depth	8-bit, 10-bit, 12-bit; Adaptive (10-bit, 12-bit) Bit	
RGB color pixel formats BayerRG8, BayerRG10, BayerRG10p, BayerRG12, BayerRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Monochrome pixel formats	Mono8, Mono10, Mono10p, Mono12, Mono12p	
erRG12p, BGR8, RGB8 (default) General purpose inputs/outputs (GPIOs) TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU Regulations (ROHS); FCC Class B digital device; CAN ICES-003 (B) /	YUV color pixel formats	YCbCr411_8_CbYYCrYY, YCbCr422_8_CbYCrY, YCbCr8_CbYCr	
TTL I/Os 4 programmable GPIOs Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 Regulations 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	RGB color pixel formats		
Operating conditions/dimensions Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU Regulations (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	General purpose inputs/outputs (GPIOs)		
Operating temperature -20 °C to +65 °C (housing) Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L × W × H in mm) 38 × 29 × 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU Regulations (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	TTL I/Os	4 programmable GPIOs	
Power requirements (DC) Power over USB 3.1 Gen 1 External power 5.0 V Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L \times W \times H in mm) $38 \times 29 \times 29$ 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU Regulations (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Operating conditions/dimensions		
Power consumption USB power: 1.9 W (typical) Ext. power: 2.1 W (typical) Mass 60 g Body dimensions (L \times W \times H in mm) 38 \times 29 \times 29 2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Operating temperature	-20 °C to +65 °C (housing)	
Mass $60 \mathrm{g}$ Body dimensions (L × W × H in mm) $38 \times 29 \times 29$ $2014/30/\mathrm{EU}; 2011/65/\mathrm{EU}, \mathrm{incl.\ amendment\ } 2015/863/\mathrm{EU}$ Regulations (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Power requirements (DC)	Power over USB 3.1 Gen 1 External power 5.0 V	
Body dimensions (L \times W \times H in mm) $38 \times 29 \times 29$ $2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU$ Regulations (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Power consumption	USB power: 1.9 W (typical) Ext. power: 2.1 W (typical)	
2014/30/EU; 2011/65/EU, incl. amendment 2015/863/EU Regulations (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Mass	60 g	
Regulations (RoHS); FCC Class B digital device; CAN ICES-003 (B) /	Body dimensions (L × W × H in mm)	38 × 29 × 29	
	Regulations	(RoHS); FCC Class B digital device; CAN ICES-003 (B) /	



Features

Image control: Auto

- · Auto exposure
- Auto gain
- Auto white balance (color models)

Image control: Other

- Adaptive noise correction
- Binning
- Black level
- Color transformation (incl. hue, saturation; color models)
- Contrast
- Custom convolution
- De-Bayering up to 5×5 (color models)
- DPC (defect pixel correction)
- FPNC* (fixed pattern noise correction)
- Gamma
- LUT (look-up table)
- Reverse X/Y
- ROI (region of interest)
- Sharpness/Blur

Camera control

- Acquisition frame rate
- Bandwidth control
- · Firmware update in the field
- I/O and trigger control

^{*}The early production cameras do not support FPNC. Support will be available with future series models.



- Readout modes (SensorBitDepth)
- Temperature monitoring
- U3 Power Saving Mode
- User sets

Technical drawing













