
DVXplorer Micro

Release 2024-05-14

iniVation AG

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Date: 2024-05-14

- Mass production DVS sensor in 90 nm BSI CIS technology
- VGA (640x480) resolution event output with up to 110 dB dynamic range, sub 1ms latency, 200 μ s temporal resolution and up to 450 million events per second throughput
- 6-axis IMU, up to 8 kHz sampling rate
- Consumes less than 140 mA at 5 V USB power supply
- Plastic case with S lens mount, 2-side mounting options and screw-locked USB port

¹ <https://inivation.com/buy/>

² https://docs.inivation.com/_static/hardware_guides/dvxplorer-micro.pdf

SPECIFICATIONS

1.1 Event Output

| Description | Value |
|----------------------------------|---|
| Spatial Resolution | 640 x 480 |
| Temporal Resolution ¹ | 200 μ s |
| Typical Latency ² | <1 ms |
| Max Throughput | 450 MEPS |
| Dynamic Range | ~ 90 dB (3-100k lux with 99.9% of pixels respond to 27.5% contrast), ~ 110 dB (0.3-100k lux with 50% of pixels respond to 80% contrast) |
| Contrast Sensitivity | 13% (with 50% of pixels respond), 27.5% (with 99.9% of pixels respond) |

¹ The temporal resolution is characterized by the timestamp unit. In fact, a timestamp unit of 1 us offers minimum gain over a timestamp unit of 200 us. For more explanation, please refer to our white paper.

² The temporal latency is given as a nominal number and can be improved with strong lighting or optimised biases.

1.2 IMU

6-axis (Gyro + Accelerometer), up to 8 kHz sampling rate. The IMU is synchronized with the event and frame output. Read more in the IMU section.

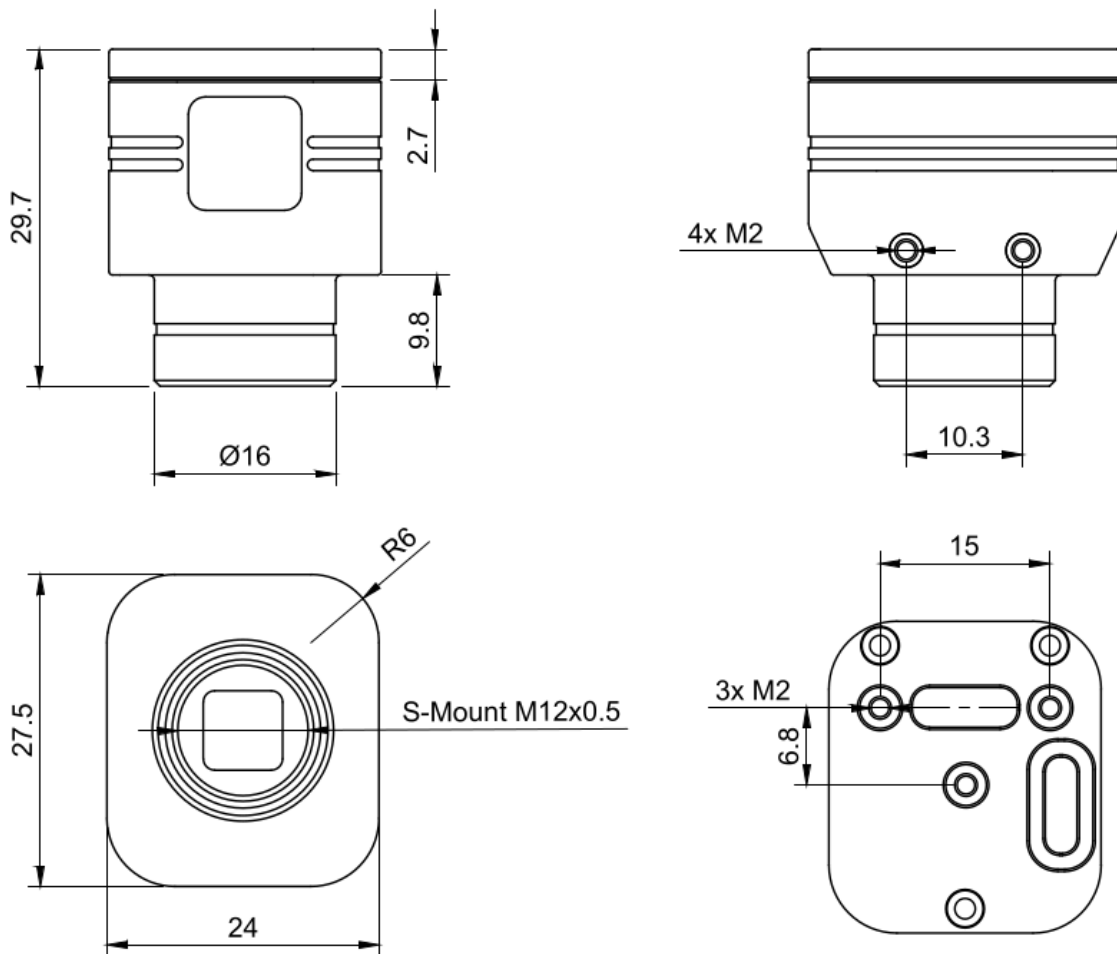
1.3 Other Attributes

| Description | Value |
|-------------------------------|---------------------------|
| Dimensions [mm] | W 24 x H 27.5 x D 29.7 |
| Weight | 16g without lens |
| Lens Mount | S-mount |
| Case Material | POM (plastic) |
| Mounting Options | 2-side M2 mounting points |
| Connectors | USB 3.1 Type-C |
| Multi-cam sync | None |
| Power Consumption | <140 mA @ 5 VDC (USB) |
| Sensor Technology | 90 nm BSI CIS |
| Pixel Pitch [μm] | 9 μm |
| Sensor Supply Voltage | 1.2V, 1.8 V and 2.8 V |

Specifications not guaranteed. All specifications subject to change without notice.

PHYSICAL DIMENSIONS

The DVXplorer Micro camera is housed in a POM plastic case. The case dimensions are depicted below.



CONNECTORS

DVXplorer Micro has one connector on the back. A USB 3.1 Type-C connector for data and power.



3.1 USB C Connector

The USB C connector is used for data and power. Any USB 3.0 or USB 2.0 cable with Type-C connector can be used. However, USB 3.0 speeds are only supported when using a USB 3.0 cable. Usage of cables with appropriate locking screws are recommended for a more secure and robust connection.

The camera lens mount is designed to accommodate CS-mount lenses. Other lenses can be accommodated by using adapters. The standard lens shipped with the camera is a C-mount lens and ships with an adapter. The chip requires a lens designed for 1/2.5" imagers.

The field of view (FOV) depends on the focal length **L** of the lens and the size **W** of the pixel array. It is computed from geometrical optics, not accounting for any lens distortion. The angular field of view (**AFOV**) is given by:

$$AFOV = 2 \arctan\left(\frac{W}{2L}\right)$$

The linear FOV (**LFOV**) at a distance **D** from the lens is given by:

$$LFOV = \frac{D * W}{L}$$

The pixel array has a resolution of 640 x 480 and measures:

- Width: 640 pixels x 9.0 μm/pixel = 5.76 mm
- Height: 480 pixels x 9.0 μm/pixel = 4.32 mm
- Diagonal: 7.20 mm

4.1 Computed Field of View

The following table shows the horizontal and vertical field of view in degrees and its size at various distances for different common focal lengths.

| Lens Focal Length [mm] | Horizontal Angular FoV [deg] | Vertical Angular FoV [deg] | Diagonal Angular FoV [deg] | Horizontal Linear FoV at 10 cm distance [cm] | Horizontal Linear FoV at 30 cm distance [cm] | Horizontal Linear FoV at 1 m distance [cm] | Horizontal Linear FoV at 2 m distance [cm] |
|------------------------|------------------------------|----------------------------|----------------------------|--|--|--|--|
| 2.10 | 107.80 | 91.61 | 119.49 | 27.43 | 82.29 | 274.29 | 548.57 |
| 2.80 | 91.61 | 75.30 | 104.25 | 20.57 | 61.71 | 205.71 | 411.43 |
| 3.00 | 87.66 | 71.51 | 100.39 | 19.20 | 57.60 | 192.00 | 384.00 |
| 3.60 | 77.32 | 61.93 | 90.00 | 16.00 | 48.00 | 160.00 | 320.00 |
| 4.50 | 65.24 | 51.28 | 77.32 | 12.80 | 38.40 | 128.00 | 256.00 |
| 6.00 | 51.28 | 39.60 | 61.93 | 9.60 | 28.80 | 96.00 | 192.00 |
| 9.00 | 35.49 | 26.99 | 43.60 | 6.40 | 19.20 | 64.00 | 128.00 |
| 12.00 | 26.99 | 20.41 | 33.40 | 4.80 | 14.40 | 48.00 | 96.00 |
| 16.00 | 20.41 | 15.38 | 25.36 | 3.60 | 10.80 | 36.00 | 72.00 |

ADDITIONAL INFORMATION

5.1 Software

DVXplorer Micro is compatible with all our software. You can use it in:

- DV software
- dv-processing

5.2 Serial Number

The serial number of the device can be found on the case, usually with “**DXU**” followed by a four-digit number printed on a label located at the bottom of the camera case.

5.3 Package Contents

DVXplorer Micro ships with the following items:

- DVXplorer Micro camera
- USB 3.1, A male to C male cable, 1m with locking screws
- 3 different S-Mount (M12) lenses
 - 3.6 mm ([Datasheet³](https://docs.inivation.com/_static/lenses/micro-lens-3-6-incl.pdf))
 - 6 mm ([Datasheet⁴](https://docs.inivation.com/_static/lenses/micro-lens-6-0-incl.pdf))
 - 16 mm ([Datasheet⁵](https://docs.inivation.com/_static/lenses/micro-lens-16-incl.pdf))
- S-Mount lockring

³ https://docs.inivation.com/_static/lenses/micro-lens-3-6-incl.pdf

⁴ https://docs.inivation.com/_static/lenses/micro-lens-6-0-incl.pdf

⁵ https://docs.inivation.com/_static/lenses/micro-lens-16-incl.pdf


5.4 Safety Information

To prevent damage to property or injury to yourself or to others, read this safety information in its entirety before using this product.

- This product is intended to be used in a laboratory and for industrial applications under controlled conditions.
- We strongly recommend that you only use high quality USB cables, like the ones provided by iniVation. Using low quality USB cables could cause damages to the device.
- Keep the product dry. Do not handle the product with wet hands. Do not handle the plug with wet hands. Do not operate the camera near water. This could cause damage to the device. The camera is not water-safe.
- Handling: Handle your product with care. It is made of metal, glass, and plastic and has sensitive electronic components inside. The product can be damaged if dropped, burned, punctured, or crushed, or if it comes in contact with liquid. If you suspect damage to the product, please contact iniVation.
- Repairing: Do not open the product and do not attempt to repair the product yourself. Disassembling the product may damage it and will void your warranty. If your product is damaged or malfunctions, please contact iniVation.
- Do not disassemble or modify this product.
- Do not touch internal parts that become exposed as the result of a fall or other accident.
- Keep this product out of reach of children. Should a child swallow any part of this product, seek immediate medical attention.
- Use travel converters or adapters designed to convert from one voltage to another or with DC-to-AC inverters.
- Explosive and other atmospheric conditions. Connecting or using the product in any area with a potentially explosive atmosphere, such as areas where the air contains high levels of flammable chemicals, vapors, or particles (such as grain, dust, or metal powders), may be hazardous. Exposing the product to environments which have high concentrations of industrial chemicals, including near evaporating liquified gasses such as helium, may damage or impair the product's functionality.
- Turn this product off when its use is prohibited.
- Do not leave the product where it will be exposed to elevated temperatures for an extended period such as in an enclosed automobile or in direct sunlight. This can lead to malfunction.

5.5 Correct Disposal



 This product and its electronic accessories should not be disposed of with other household waste. If you are unable to dispose of this item safely please return it to iniVation AG.

CERTIFICATIONS

DVXplorer Micro is currently not certified for any purpose.