

# DVXplorer Mini

640 x 480



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

## Specifications

### Event output

Spatial resolution 640 x 480

Temporal resolution <sup>1</sup> 200  $\mu$ s

Typical latency <sup>2</sup> <1 ms

Max throughput 450 MEPS

Dynamic range  
 Approx. 90 dB (3-100k lux with 99.9% of pixels respond to 27.5% contrast)  
 Approx. 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)

### Frame output

The camera does not output frames of intensity images. However, similar intensity images can be reconstructed from the event output by our DV software <sup>3</sup>

### IMU

6-axis (Gyro + Accelerometer), up to 8k Hz sampling rate

## Other attributes

Dimensions [mm]	H 29 x W 29 x D 32
Weight	43 g (aluminium) and 21 g (POM) without lens
Lens mount	S-mount
Case material	Anodized aluminum or POM
Mounting options	2-side Whitworth 1/4"-20 female and M3 mounting points
Connectors	USB 3.1 C
Power consumption	<140 mA @ 5 VDC (USB)
Sensor technology	90 nm BSI CIS
Pixel pitch [ $\mu\text{m}$ ]	9 $\mu\text{m}$
Sensor supply voltage	1.2V, 1.8 V and 2.8 V
Certifications	CE certified (in process)

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

<sup>1</sup> The temporal resolution is characterized by the timestamp unit. In fact, a timestamp unit of 1  $\mu\text{s}$  offers minimum gain over a timestamp unit of 200  $\mu\text{s}$ . For more explanation, please refer to our [white paper](#).

<sup>2</sup> Nominal figure; can be improved with strong lighting/optimised biases.

<sup>3</sup> Please view our [FAQ](#) for further details.

## Physical dimensions

The DVXplorer Mini camera is housed in an anodized aluminum or POM case. The case dimensions are depicted below.

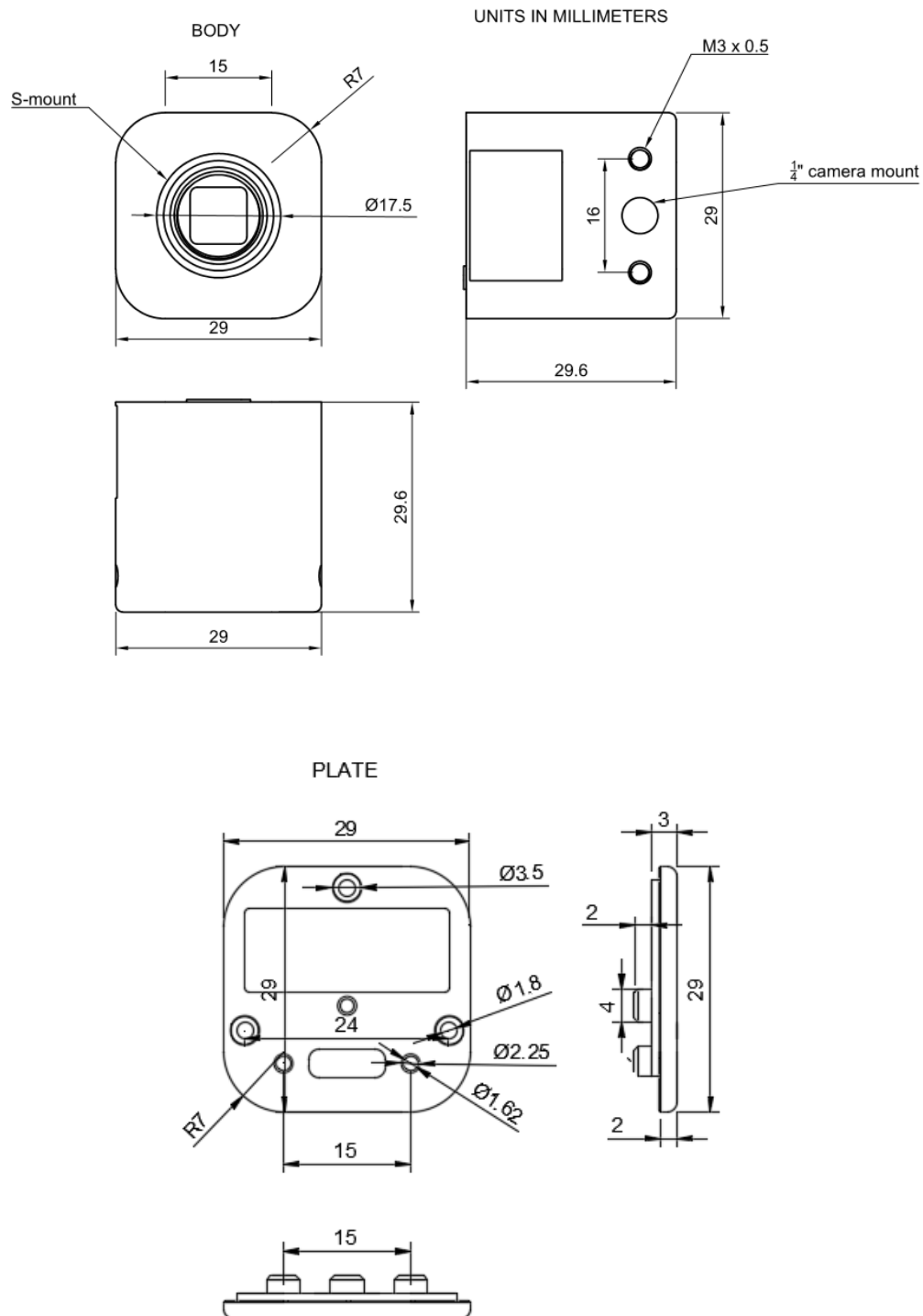


Figure 1 Dimensions of the DVXplorer Mini camera case

## Connectors

DVXplorer Mini has one connector on the back. A USB 3.1 C type connector for data and power.



*Figure 2 Connector on the back of DVXplorer Mini*

### USB C connector

The USB C connector is used for data and power. Any USB 3.0 or USB 2.0 cable with 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.

## Optics

The camera lens mount is designed to accommodate S-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-inch 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:

$$AFOV = 2 \tan^{-1} \left( \frac{W}{2L} \right)$$

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

$$LFOV = D * W/L$$

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

- Width: 640 pixels x 9 um/pixel = 5.76 mm
- Height: 480 pixels x 9 um/pixel = 4.32 mm

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

### Computations of Field of View

Lens focal length [mm]		2.1	2.8	3.6	4.5	6	12	16
Angular field of view horizontal [deg]		107.8	91.6	77.3	65.2	51.3	27.0	20.4
Angular field of view vertical [deg]		91.6	75.3	61.9	51.3	39.6	20.4	15.4
Angular field of view diagonal [deg]		119.5	104.3	90.0	77.3	61.9	33.4	25.4
Linear field of view horizontal [cm]	dist. 10 cm	27.4	20.6	16.0	12.8	9.6	4.8	3.6
	dist. 30 cm	82.3	61.7	48.0	38.4	28.8	14.4	10.8
	dist. 100 cm	274.3	205.7	160.0	128.0	96.0	48.0	36.0

## Software

DVXplorer Lite is compatible with the DV software platform. Go to <https://inivation.com/> to access the latest version of the software and SDK.

## Serial number

The serial number of the device can be found on the case, usually with “DXM” followed by a five-digit number printed on a label located at the back of the camera case.

## Package contents

DVXplorer Mini ships with the following items:

- DVXplorer Mini camera
- USB 3.1, A male to C male cable, 1m with locking screws
- 3 different S-Mount (M12) lenses (3.6, 6 and 16 mm EFL)
- S-Mount lockring
- Tripod

## 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 one 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.
- 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.