



Most durable, precise and practical 360° camera for urban mapping & surveying.



Ultimate 360° Camera

Mosaic 51 is a Robust 360° Camera for Mobile Mapping, Street View, Surveying, Infrastructure Inspection and related 360° imaging applications such as VFX & HDR light probes for CGI backplates

Designed and built from the ground up to be durable and future proof.

Six 12-Megapixel image sensors

12-bit compressed RAW images or h.264

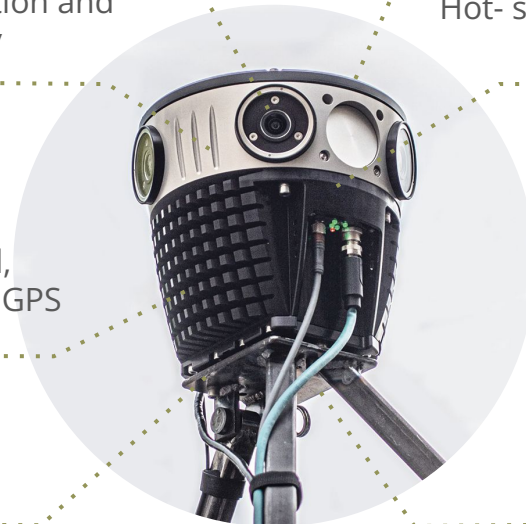
Industrial-Grade Construction and Durability

Hot-swappable storage

Advanced, precision GPS

AES 256-bit encryption

Secure mounting hardware





Mosaic 51

*Designed and built in Europe
for outdoor mapping in all
kinds of weather.*



Feature highlights

**Finally – durability,
precision, usability
and reliability all in
one camera.**



- 10fps h.264 (120Mbps per sensor)
- 7fps 12-bit Compressed RAW (up to 8:1) in full resolution (coming Q4)
- Onboard hot-swappable USB 3.0 storage
- External storage over ethernet via NFS
- High end precision GPS with Dead Reckoning +/- 1 meter
- 6-axis IMU
- Sealed and water-resistant housing
- Protected lens, easily replace lens covers when scratched or smudged
- No vendor lock-in



Architecture

The six Sony image sensors with wide angle lenses capture 360° of RAW image data, which is precisely synchronized by our proprietary algorithm.

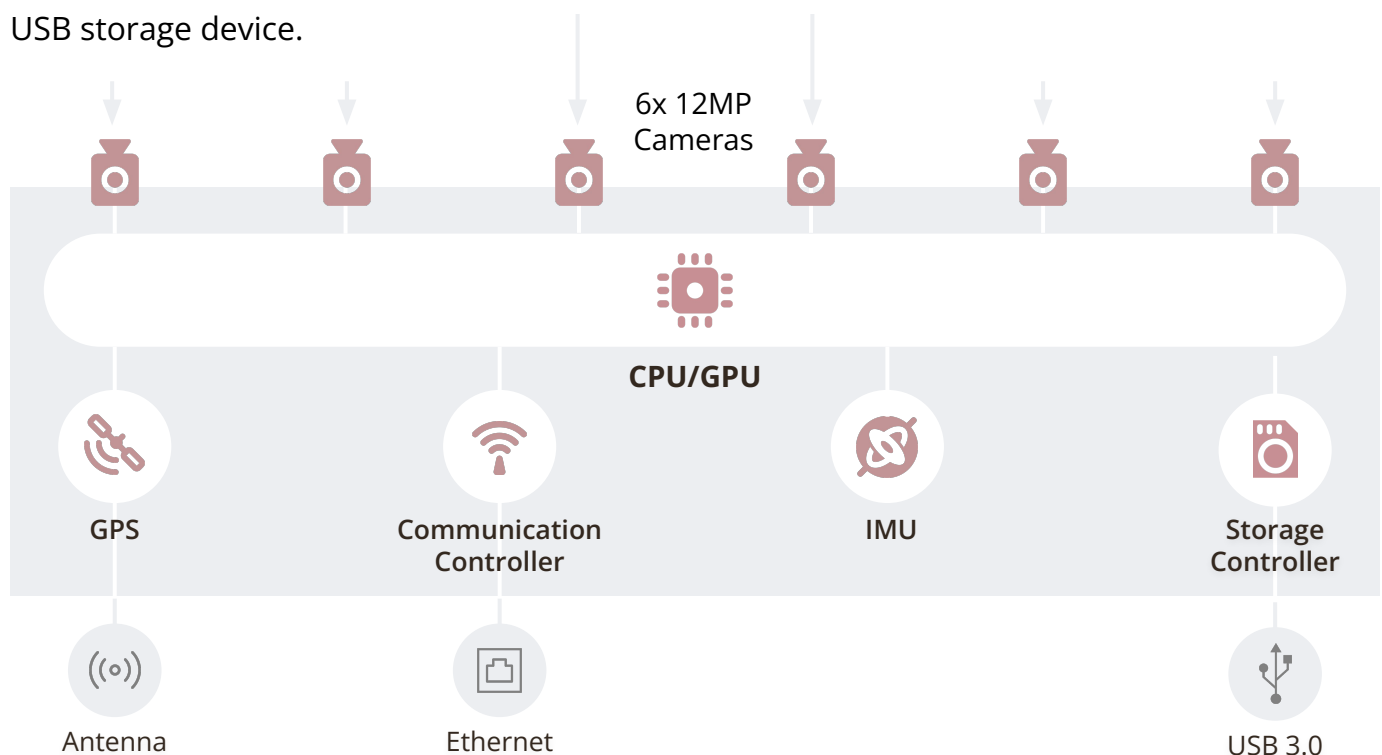
This image data is processed into an 8-bit image file by the ISP and compressed to a high-bitrate h.264 file and written to the removable USB storage device.

At the same time, we capture IMU data with high sample rate as well as precise GPS data.

The camera can be monitored and controlled via an ethernet connection by any device with a web browser (PC, tablet, or phone).

The main processor combines a powerful CPU plus GPU making it fully mobile – no need for any devices, computers or power within the vehicle.

2 Terabytes and hot swappable storage guarantee smooth data capture throughout a full day.





Design and Construction

We have used our years of experience in this field to carefully and deliberately design this camera to work well in the most demanding environments:

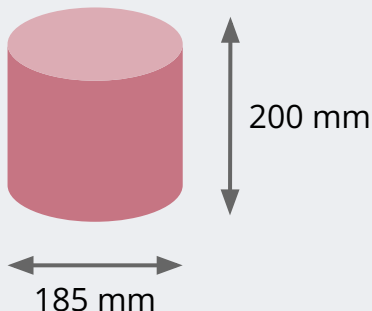
- industrial grade waterproof connectors
- protected lenses which can withstand harsh daily use
- a hermetically sealed water-resistant enclosure with substantial thermal mass and heat sinks for passive cooling

Our optical design ensures sharp images at all angles, without a drop off in resolution at the edges from which other cameras using fisheye lenses might suffer; we strike a balance between uniform sharpness without using too many image sensors.

Other design considerations, such as a removable, swappable storage device and control via any web browser, keeps the basic operation of the camera as simple as possible for untrained staff.

Dimensions

Height: 200 mm
Width: 185 mm

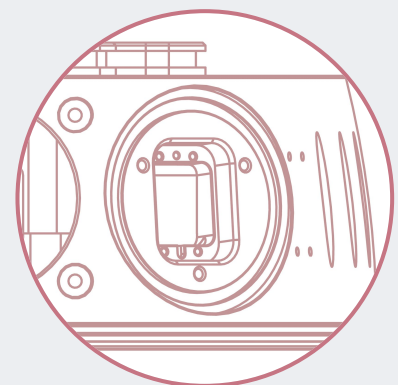


Weight

Approx. 4.5 kg (~10 lbs)

Power consumption

Average: 25 W
Maximum: 35 W

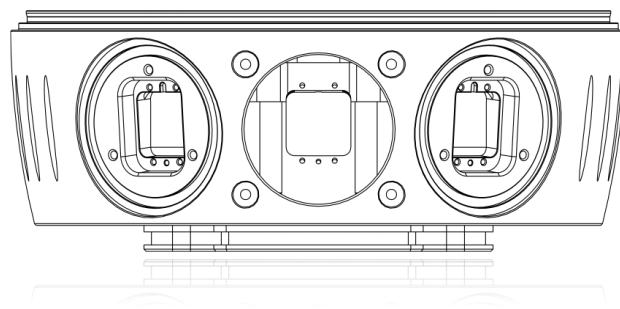




Mosaic 51

6X wide angle cameras

High sensitivity and low noise sensors provide ideal pixel density and consistency of optical resolution across the frame with minimal fisheye distortion or compression.



Sensor

Sony CMOS 12MP

Lens focal length

2.52mm +/- 5%

Pixel size

1.55μm

Lens focal length / 35mm eq.

14.1mm

Focusing range

0.3mm – ∞

Aperture

f/2.4

Guaranteed temperature performance

Camera sensor

-10°C – 60°C



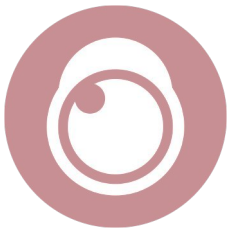
Camera lens

-20°C – 80°C



Mosaic 51

Top of the line, protected optics



The crispest, cleanest and most true-to-life image available on the market.



- Six 12-Megapixel image sensors (five in a circle and one pointing up) giving 12K resolution panoramas, unsurpassed in this class
- Microsecond-level synchronization (sync measured in microseconds, not milliseconds)
- 125° x 95° lenses utilizing all pixels on the sensor, with just enough overlap giving a good balance of overlap vs. resolution.
- Minimal stretching and distortion of the source images means that the actual resolution in the final panorama is consistent across the whole image, including straight up
- Image Sensors with proper thermal management, giving noise-free operation even in the harshest environments
- Replaceable flat glass lens covers prevent expensive servicing of lenses. Easily and economically replace lens covers rather than requiring costly manufacture servicing.



Mosaic 51

Advanced, precision GPS



Unsurpassed precision positioning, including underground.

- Connects up to 4 GNSS networks simultaneously (GPS, Galileo, Glonass, BeiDou) for precision measured to the meter
- Active dual-band antenna giving a fix in seconds, and precise location even in urban canyons
- Dead Reckoning allows positioning in tunnels and indoors for up to approx. 15 minutes with sub 5-meter accuracy

Amazing 12-bit compressed RAW images or h.264



Up to 8:1 compressed RAW. Another game-changer for efficiency (coming Q4)

- Option for internal removable storage: m.2 disk, up to 2TB capacity, hot-swappable
- Option for external storage over ethernet via NFS
- Secure mounting hardware for hassle-free mounting to any car roof rack



Mosaic 51

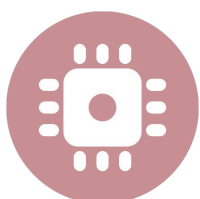
AES 256-bit encryption



Secure and confidential while still offering highly-efficient computation capacity.

- The operating system and data acquisition were designed and built with security in mind.
- Option for data acquisition with 256-bit encryption is available out of the box, allowing full confidentiality and GDPR compliance.
- Possibility to limit camera operator from accessing files (at client's request.)

Built-in GPU – not one but two!



High powered computing without a computer (on board).

- Mosaic is the only 360 camera on the market with not one, but TWO built-in GPUs, delivering 3 Teraflops of compute capacity.
- Capable of running most standard image processing libraries written in CUDA (coming Q4)
- Save only the images that you want to, based on specific criteria, resulting in a 10–100x savings in storage and data transmission (coming Q4).



Mosaic 51

Image quality › Level of detail

Never before seen
crisp, clean,
12K-resolution
video to better map
your city, asset,
space, or streets.





Mosaic 51

Image quality › Us vs. the competition

See the superb image quality of the Mosaic 51 versus the competitor in a side-by-side comparison of the same street view.

Mosaic 51 camera



- preserves nearly all of the dynamic range even in harsh lighting
- eliminates artifacts from different image sensors exposing the scene differently
- offers a single unified and consistent image
- minimizes 'blowout' between sun and edge of buildings

The competition









- camera / image processing implementation is sub-optimal
- many over- and under-exposed pixels
- very few correctly-exposed pixels
- high 'blowout' between sun and edge of buildings



Mosaic 51

Competitive matrix

Mosaic 51 outperforms
the competition in
every category

	Mosaic 51	NCTech Pulsar	Insta360 Titan	Insta360 PRO	Ladybug 5	Google
						
Resolution	12K	11K	11K	8K	8K	16K
Encryption	YES	YES	NO	NO	NO	NO
Lens protection	YES	NO	NO	NO	YES	NO
On-board GPU	YES	NO	NO	NO	NO	NO
IP64 water resistance	YES	YES	NO	NO	YES	NO
Waterproof industrial grade connector	YES	NO	NO	NO	NO	YES
Vendor unlocked	YES	NO	YES	YES	YES	NO
Compressed 12-bit RAW	Q4	NO	NO	NO	NO	NO
H.264 120 Mbit	YES	NO	NO	NO	NO	YES
Single swappable storage	YES	NO	YES	YES	NO	NO
Internal & external storage via NFS	YES	NO	NO	NO	NO	NO
High precision GPS	Q4	NO	NO	NO	NO	YES
External GPS antenna	YES	NO	NO	NO	NO	NO
UDR – Untethered Dead Reckoning	YES	NO	NO	NO	NO	NO
Deep LIDAR integration ready	YES	NO	NO	NO	NO	YES
Robust integrated car mount	YES	NO	NO	NO	NO	YES



Applications

How to create competitive advantages with Mosaic 51



Logistics/Delivery companies and Municipalities need to cease their dependency on Google to remain competitive.



Autonomous vehicles are arriving yet infrastructure is not in place. A Reference Map is required in order for them to exist.



The EU Green Deal is accelerating the Smart City initiatives across Europe, compelling cities to map their streets at increasing frequency and resolution.



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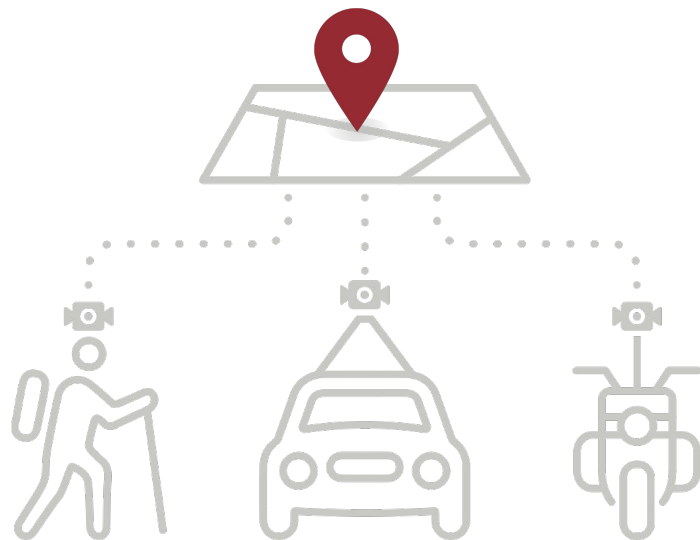
The company

Mosaic is a 360° camera hardware and services company based in Prague, Czech Republic.

We are passionate about documenting the world.

We can map a city or a whole country with our growing fleet of cars, motorcycles, bicycles, and hikers.

We are one of the only companies in the world building a camera specifically for ground-level mapping and imaging at scale, with available services combining our hardware, logistics know-how, and delivery of data in one integrated package.



Our team has been in the game for decades making us industry experts in the field of 360° imaging.

Our plan is to build a single, detailed, high resolution photographic map of all the world's streets over the next few years. This will allow us to understand the world better, faster, and in greater detail than ever before: better street maps, better driving directions, better traffic management, better city management and safety inspection, and safer self-driving vehicles on the street.