

CUBERT HYPERSPECTRAL

The experts for real-time spectral imaging
Catalogue 2025

Meet the Hyperspectral Experts

Welcome to Cubert – pioneers in hyperspectral snapshot cameras for real-time solutions, made in Ulm, Germany.

Since 2012, we've been breaking new ground in hyperspectral imaging, working closely with our customers to explore innovative applications across diverse fields.

Snapshot Imaging for Real-Time Applications

At Cubert, we provide advanced, ready-to-use hyperspectral cameras designed for true snapshot imaging. This unique capability enables live applications like real-time monitoring, object tracking, and video-based analysis, transforming hyperspectral data capture for various applications



Meet the Hyperspectral Experts

Application fields



Our hyperspectral cameras enable advanced applications across a wide range of fields. In **drone-based remote sensing**, they provide high-resolution data ideal for precision agriculture, forestry, and environmental monitoring, allowing for detailed analysis of vegetation health, soil moisture, and other critical indicators. In **biomedical imaging and surgical guidance**, our technology supports non-invasive analysis across disciplines, from dermatology to ophthalmology and surgery, offering in-depth views of skin, tissue, and other biological materials. For **industrial quality control**, hyperspectral imaging excels at detecting foreign objects, inspecting food quality, and assessing material composition directly on production lines. In **security and defense**, our cameras enhance situational awareness and target identification, where real-time data and precision are crucial for success in demanding environments..

Meet the Hyperspectral Experts

Customization and Expertise in Integration

Every project is unique, and at Cubert, we focus on tailoring our technology to meet your specific requirements.

We integrate our cameras seamlessly into your systems, handling everything from camera adjustments to lighting, interfaces, and connectivity – so you can focus on your work without needing to master the technology.

Our strong CUVIS software and custom algorithms ensure accurate, on-target analysis, without requiring you to be an expert in hyperspectral imaging. And with our SDK, you have the option to integrate the cameras yourself, while we're always here to support you – because we're the experts.



Meet the Hyperspectral Experts

Get in Touch

Based in Ulm, Germany, Cubert is committed to delivering quality solutions that empower our customers. Contact us today to learn more about how our hyperspectral cameras and software can help you reach your goals.



What's new in 2025?

Camera Product Portfolio

The **ULTRIS 5** stands out as the most affordable and versatile entry-level choice, featuring a compact design, swift 75 Hz performance, and adaptability with a C-mount lens adapter. It's ideal for OEM applications, such as food and quality control, as well as life sciences. The **ULTRIS X20** takes the lead as a premium scientific-grade camera, offering the highest spectral resolution with comprehensive coverage of the entire VNIR range. For remote sensing from UAVs, the **ULTRIS X20 Plus** adds dual-sensor capabilities and pansharpening for advanced applications, enhancing spatial detail in aerial images. The **ULTRIS XMR** represents the next generation with USB3 connectivity and the highest native spatial resolution, designed for real-time tracking and monitoring across various industries. Finally, the **ULTRIS SWIR 1** pioneers SWIR imaging at an impressive 80 Hz, covering the range from 980-1650 nm and making it ideal for fast, real-time SWIR applications. Notably, the ULTRIS 5, XMR, and SWIR 1 models allow lens changes through a C-mount adapter, ensuring adaptability for diverse applications.



What's new in 2025?

Accessory Packages

Lab Lite Package: Essential **starter kit** included in all packages. It contains the software, camera calibration, and basic accessories you need to get started.

Flight Lite Package: This package extends the Lab Lite with a **mini computer** and **GPS**, making it ideal for automated and semi-automated application fields, as well as UAVs.

Flight Pro Package: The ultimate UAV integration solution for capturing high-quality aerial imagery with ease. This package extends the Lab Lite with the **UXG Gimbal** designed for the **DJI M300/350 RTK**, including a mini computer and connected via **Skyport**.



What's new in 2025?

Cubert CUVIS Software Suite

Outperforming the **previous CUVIS 2.9.1 Fuchsia**, meet our latest software version. **CUVIS 3.2.1 Ginger** introduces a revised Touch version as well as an extensive Software Development Kit (SDK) based on C, now available for both Windows and Linux.

In Ginger, the file format has undergone significant changes. The **new session files** (cu3s) now encompass all calibration files, including White and Dark, streamlining the service team's ability to respond promptly to customer requests. Notably, the **Cubert Touch GUI** has seen enhancements, introducing a **light mode** that greatly improves visibility and ease of operation in sunny and bright conditions. Additionally, the software is now **multilingual**, automatically adapting to the language settings of the Windows system. Feel free to reach out for a demonstration or training session to explore these updates further.



What's new in 2025?



Software Development Kit (SDK)

This robust SDK enhances the flexibility of our imaging systems, allowing seamless integration into a wide range of applications. With wrappers for **Python**, **C++**, and **C#**, Ginger provides a comprehensive development environment, catering to diverse programming preferences. This expansion in SDK capabilities ensures optimal compatibility and ease of use for developers across different platforms and coding languages.

The **CUVIS SDK**, coupled with **CUVIS AI**, our innovative open-source platform for applying machine learning in hyperspectral imaging, is now conveniently accessible on GitHub. Visit <https://github.com/cubert-hyperspectral> to learn more.

	ULTRIS 5	ULTRIS X20 / X20 Plus	ULTRIS XMR	ULTRIS SWIR 1
	Entry / OEM Camera	Premium UV-VIS-NIR Camera	Next-Gen HR Camera	Hyperspectral SWIR Camera
Applications	OEM (food, quality control), life science (skin, brain, surgery), compatible with medical imaging devices, affordable HSI camera for scientists	UAV-based aerial mapping, remote sensing, field and lab use, scientific research, reference model for exploring wavelengths in industrial applications	Real-time tracking and monitoring, security-related tasks, chemical imaging across multiple fields, life science (skin, brain, surgery), compatible with medical imaging devices	All SWIR applications, from remote sensing to industrial quality control (e.g., detecting water content/humidity), compatible with C-mount devices
Key Features	Most versatile, available C-mount lens adapter, as high-speed version with up to 75 fps, and as ruggedized version.	Highest quality, X20 Plus adds a high-resolution panchromatic sensor, ideal for UAV aerial imaging. Pansharpening for improved spatial resolution.	Next-gen camera with 17 fps, powered via USB3, offering the highest spectral resolution of the lineup. Easy to use with integrated relay lens for mounting any C-mount lenses and optical systems.	First hyperspectral snapshot SWIR camera, extremely fast (80 fps), USB3 connection. Ideal for industries requiring SWIR imaging.
Price Range	Entry-level	Premium	Mid-range	Mid-range
Wavelength Range	450 – 850 nm	350 – 1000 nm	430 – 910 nm	980 – 1650 nm
Spectral Bands	51	164	61	38
Spectral Sampling	8 nm	4 nm	8 nm	18 nm
FWHM	26 nm @ 532 nm	Constant 10 nm	Constant 25 nm	Avg. 80 nm
Bandpass Filter	LVF	Mosaic	Mosaic	LVF
Spatial Resolution	290 x 275 pixel	410 x 410 pixel, X20P: 1886 x 1886 pixel (Pan)	1000 x 1000 pixel	200 x 200 pixel
Total Data Points	51 x 79 750 (4M)	164 x 168 100 (24.5M)	61 x 1 000 000 (61M)	38 x 40 000 (1.5M)
Lens / Optics	C-mount 2/3"	-	C-mount 4/3"	C-mount 2/3", 1"
FOV (Field of View)	15° (w/o lens) / lens-dependent	35°	lens-dependent	lens-dependent
Max Frame Rate	15 Hz / 75 Hz (HFR)	max 4 Hz	17 Hz (8 bit) / 12 Hz (12 bit)	80 Hz
Data Link	GigE / 10 GigE (HFR)	GigE	USB 3.0	USB 3.0
Integration Time	0.1 – 1000 ms	0.1 – 1000 ms	0.1 – 1000 ms	0.1 – 1000 ms
Data Depth	12 bit	12 bit	12 bit	12 bit
Technology	Light Field	Light Field, Dual Sensor (X20P)	Light Field	Light Field
Readout	Global Shutter	Global Shutter	Global Shutter	Global Shutter
Sensor	Sony IMX264	CMOSIS CMV20000, Sony IMX264 (X20P)	Sony IMX540	Sony IMX990
File size processed	< 8 MB	< 55 MB	~300 MB	3 MB
Weight	126 g	350 g / 630 g (X20P)	700 g	140 g (w/o lens)
Dimensions	29 x 29 x 65 mm	60 x 60 x 57 mm / 86 x 121 x 105 mm (X20P)	40 x 40 x 217 mm	30 x 30 x 85 mm (w/o lens)
Options	C-mount adapter High Frame Rate (HFR) Industrial Housing (IP66)	only X20: Industrial Housing (IP66) Underwater Housing (IP68)	Wavelength range customizable	-

Premium Scientific Grade

ULTRIS X20

**Hyperspectral
Powerhouse for Highest
Standards**

The ULTRIS X20 stands as a premium scientific-grade camera, distinguished by its exceptional spectral resolution and quality. Encompassing the entire VNIR range (**UV VIS NIR**), it delivers comprehensive spectral coverage essential for diverse applications. With a substantial resolution of 410x410 pixels, this camera excels in capturing detailed imagery, making it an ideal choice for applications demanding top-notch precision and scientific accuracy.



Dual Sensor Remote Sensing

ULTRIS X20 Plus

Hyperspectral Camera for UAV Aerial Mapping

Designed specifically for remote sensing applications from UAVs, the Ultris X20 Plus presents a cutting-edge solution with dual-sensor capabilities. Integrating a second high-resolution panchromatic sensor, this camera elevates imaging capabilities, allowing for enhanced spatial resolution through **pansharpening** techniques. While its complexity may be notable, this camera effectively broadens the capabilities established by the X20, rendering it well-suited for advanced applications that demand sophisticated data analysis.



High Resolution Spectral Camera

ULTRIS XMR

Revolutionizing Imaging Across Industry

The ULTRIS XMR captures 61 spectral channels simultaneously at **1 Megapixel resolution** each, enabling real-time imaging and video spectroscopy for rich, detailed data analysis. Its user-friendly design is perfect for lab and field use, offering fast data capture via USB3 and robust performance in various environments. Enhanced by AI-powered Cuvis.ai software, it simplifies surface classification. Customizable to meet specific needs, the ULTRIS XMR is ideal for applications like **object tracking** and **dynamic monitoring** across diverse industries.



Affordable Versatility

ULTRIS 5

Compact & Swift: Advancing Hyperspectral Imaging

The **ULTRIS 5** emerges as the **most affordable** and versatile model, positioning itself as an ideal entry-level choice for a wide range of applications. Its **compact and user-friendly** design facilitates easy handling and operation, ensuring a seamless user experience. With swift performance featuring a rapid 75 Hz frame rate, this camera excels in efficient data acquisition, catering to dynamic scenarios. Notably, its adaptability is enhanced through support for lens changes using a **C-Mount adapter**, enabling flexibility across diverse applications.



SWIR Snapshot Pioneer

ULTRIS SWIR 1

Hyperspectral Snapshot SWIR Camera at Video Rates

The **ULTRIS SWIR 1** stands as the pioneering hyperspectral snapshot SWIR camera, leveraging cutting-edge light field technology. Distinguished by its remarkable speed, boasting an **80 Hz** frame rate, it proves highly effective in capturing dynamic scenes with precision. Covering the SWIR range from **980 to 1650 nm**, this camera provides unique spectral insights essential for a myriad of applications. Notably adaptable, it allows for lens changes through a **C-Mount adapter**, further enhancing its versatility across a diverse range of applications.



UXG Gimbal

ULTRIS gimbal for DJI M300/350 RTK

Our gimbal designed exclusively for the **DJI M300/350 RTK**. The UXG Gimbal integrates the **X20 Plus**, the major model for UAV acquisitions, onto the M300, making it the perfect choice for your next mission.

The gimbal connects seamlessly via the **DJI Skyport**, making it easy to set up and use. With a built-in Mini PC, you record image data and GPS data gathered from the M300, giving you valuable insights into your flight data.

The gimbal also comes with the **Cubert Touch** software accessible in the **DJI Controller**, allowing you to control the camera and adjust the settings with ease. And, with the camera triggered by the drone, you can be sure that you're capturing exactly what you need to make informed decisions.

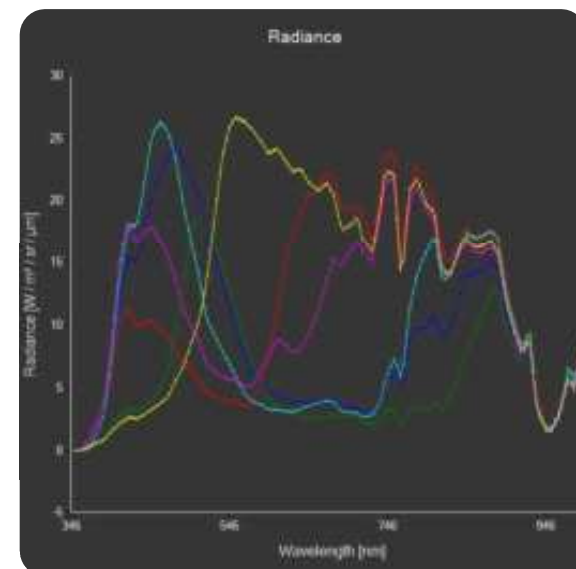
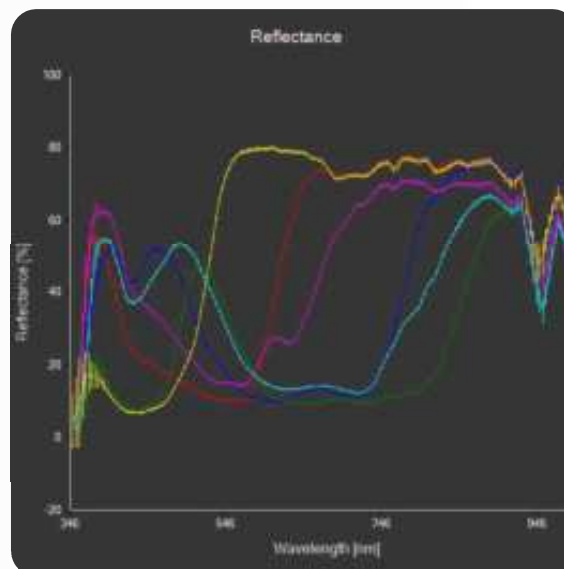


Radiometric Calibration

Over the past few years, we have made significant advancements to our basic software, which we are excited to share with our customers.

Thanks to our improved manufacturing capabilities, we are now able to perform radiometric calibration on all camera products. This means that all of our cameras, in addition to the well-known data formats of **Raw Data** and **Reflectance**, are now able to take **Radiance** data as well. This is crucial for any calibration process, whether it's in-field or in-lab, or for the precise characterization of light, just to name a few examples.

Reflectance, which is the dimensionless ratio of reflected to incident radiation, and radiance, which describes the energy flux leaving the surface and has a physical unit ($\text{W}/\text{m}^2 \text{ sr nm}$), are both now supported.



Cubert CUVIS HSI Software

Our latest software suite, **Cubert CUVIS 3.2.1 Ginger**, still includes the GUI (Cubert **Touch**) and the backend (Cubert **Core**) for Windows-based systems, now equipped with more features, such as the much more sophisticated **export tool**.

Introducing the powerful and versatile **CUVIS SDK** - the ultimate solution for developers looking to create advanced imaging applications!

Built on **C Code**, our SDK offers unparalleled flexibility and performance for your development needs. With additional wrappers for **C++**, and **Python (3.9)**, you can choose the language that best suits your development workflow.

Our SDK is available for **Windows 10, 11**, and **Ubuntu 20.04**, making it easy to integrate into your existing environment. Plus, with all the functionalities available in the GUI, you can create high-performance applications with ease.

With our **doxygen documentation**, you can get up and running quickly, while simple examples for all wrappers for measurement manipulation and capturing make it easy to get started. And to make things even easier, we've included sample data so you can dive right in and start exploring the full capabilities of the SDK.

