



quantum
systems



NO
COMPROMISE.
JUST FLY.

WHY QUANTUM-SYSTEMS?



LARGE PAYLOADS

We offer the highest quality sensors currently available and give you the flexibility to add new payloads as your needs change.



BEST COVERAGE

Long flight times combined with fast cruising speeds and high quality sensors enable our UAVs to quickly cover large areas at high resolution.



NO RUNWAYS

Take-off and land vertically, from anywhere, no extra equipment needed! Just push a button and our fully integrated autopilot safely and efficiently flies for you.

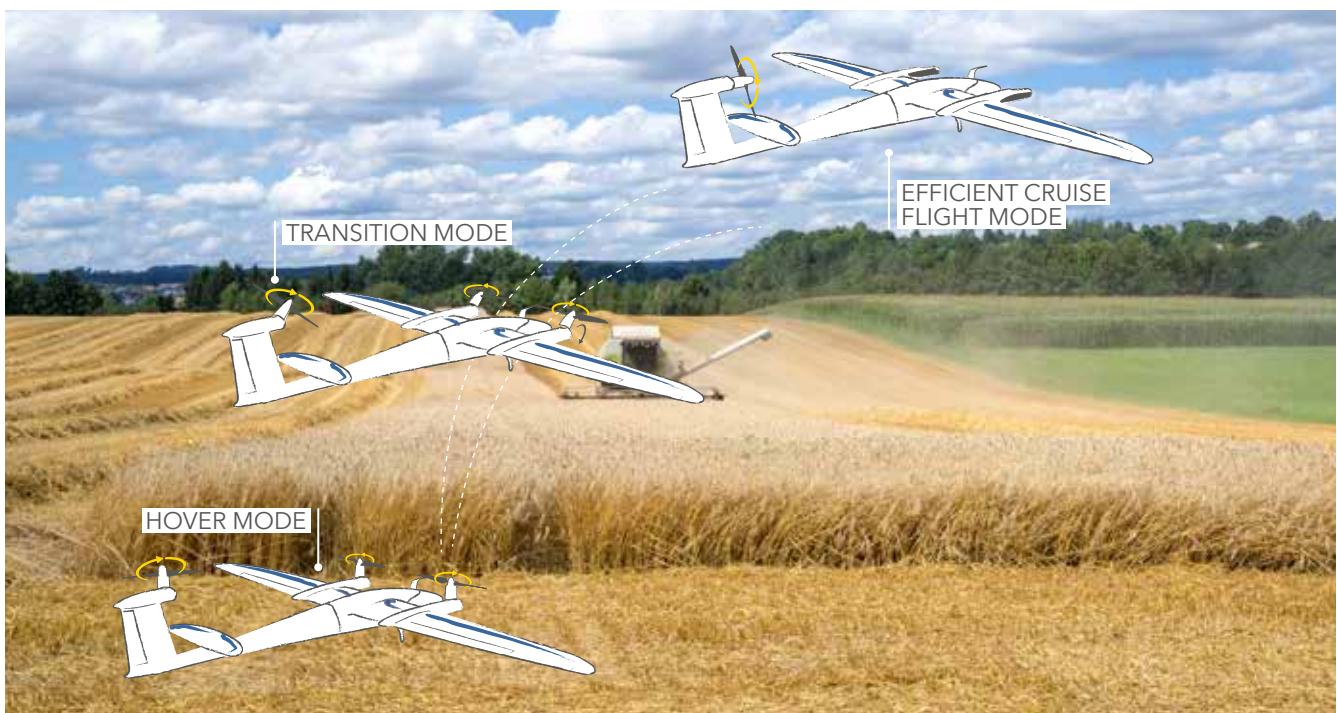


PROFESSIONAL QUALITY

Starting with the best materials, we precisely engineer every component and build in redundancy for unsurpassed reliability, ease of handling, and stable autonomous flight.

ONE-BUTTON SOLUTION

Our fully autonomous UAVs take-off and land vertically like a multicopter, but also fly as efficiently as a plane. No expert training is necessary thanks to our sophisticated hardware and software that work together seamlessly. ■



YOUR APPLICATION OUR SYSTEM



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Quantum-Systems produces state-of-the-art VTOL UAVs that do not need a runway. Our two different models, the Trinity and the Tron, share our common flight controller, long flight times, high speeds and flexible payload options.

The Trinity has a 550g (1.2 lbs) payload capacity and flies for 60 minutes. It can carry a wide variety of sensors customized for agricultural data collection, mining, insurance and more.

When your application requires greater payloads or flights times, the Tron carries up to 2kg (4.4 lbs) payloads and flies up to 90 minutes, covering a total area of up to 11 km² (4.2 sq mi) at 100m (328 ft) above ground level (AGL). Currently we are working on a search and rescue version.

You can customize each drone's payload bay to make sure that the correct data is collected for your application. Agriculture customers can use the Trinity's included multispectral sensor array and RGB camera to collect data. Using either the Trinity or the Tron, first responders and security users can add thermal sensors that will help locate missing people and detect potential security concerns.

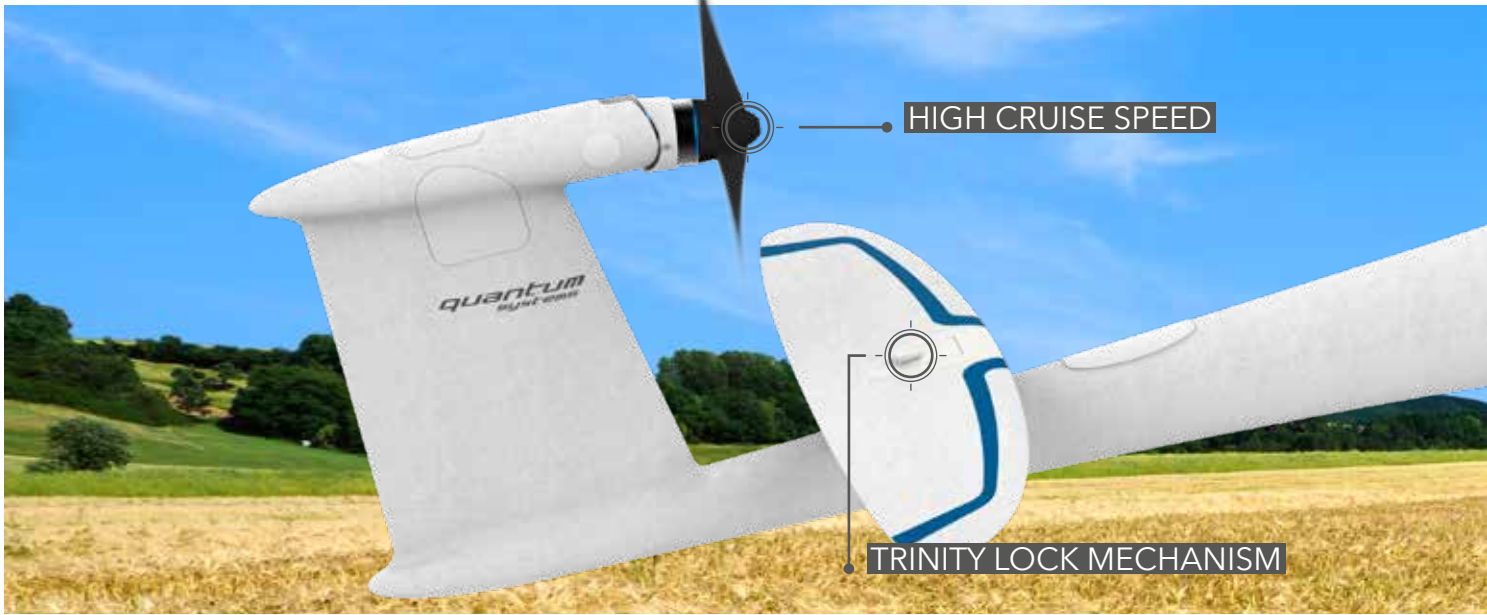
Whatever your application is, Quantum-Systems can provide you with a system that fits. ■





TRINITY

Portable and affordable



The Trinity combines high efficiency, flexible mission capabilities, is portable and has a small footprint. **The result is the world's most compact VTOL fixed-wing drone available today!**

We designed the Trinity as a product that meets the requirements of professionals. We started from scratch with a highly integrated industrial product in mind.

You can see the result in every detail, whether it is the optimized electric layout, the efficient cargo container or the clean finish of the outer shell; the

Trinity showcases the best of German engineering.

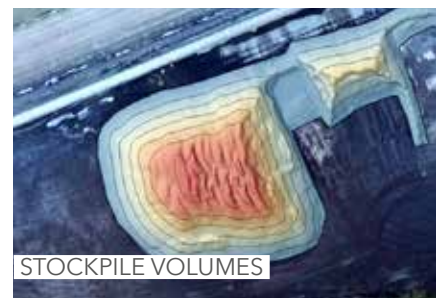
The **Trinity Lock Mechanism (TLM)** enables the operator to ready the whole system in a matter of seconds. No tools or special knowledge are required!

The **three-rotor configuration** enables it to achieve **perfect VTOL capabilities and a highly-efficient long range flight.** The perfect weight and balance of the Trinity keeps the rear rotor in the ideal thrust-to-size ratio in both VTOL and forward flight modes.

A large payload bay offers enough space for two sensors. A Sony UMC-R10C and a Tetracam ADC Snap is one configuration. Other configurations can be installed according to the customer's application.

We made sure that **the integrated sensors are shock and vibration protected** and the **SD-cards are easily accessible** from the outside. Both of them are powered by the Trinity's battery. **The combination of our selfdeveloped hard- and software such as our autopilot guarantees perfect results with maximum accuracy.**

COMPLETE SOLUTION: The Trinity is highly efficient, achieves long flight times, and is an outstanding value for a professional-grade drone.



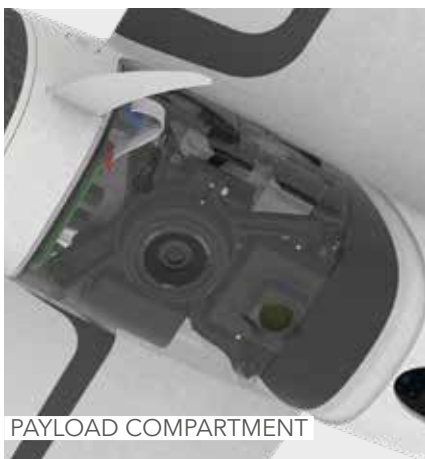


Pressing one button is enough and the Trinity will do its assigned job. The QS RC Transmitter has a clean layout without confusing switches and levers. The Trinity and the RC transmitter work together seamlessly to just get your job done.

OPEN SOURCE PAYLOAD COMPARTMENT

The Trinity is the perfect platform for your application in the fields of **agriculture, forestry, mining and 3D reconstruction.**

However, if there is a use case we don't cover yet, we welcome your suggestions! To support your project, we offer the 3D files of our cargo compartment for free to enable you to adapt it to your mission profile. ■



PAYLOAD COMPARTMENT

TECHNICAL DATA

Max. Take-off weight	4,5 kg (9.9 lbs)
Max. Flight time	60 min
Payload (with compartement)	Max. 550 g (1.2 lbs)
Cruise speed	17 m/s
Max. Range (100 m / 328 ft AGL)	70 km = 500 ha (45.5 mi = 1.9 sq.mi)
Max. Range (200 m / 656 ft AGL)	80 km = 1300 ha (49.7 mi = 5.0 sq.mi)



TRON

Large payloads and maximum flight

|| The Quantum Tron is without any doubt an outstanding technical solution. This concept has a lot of unmatched benefits. ||

Jochen Kittlaus, Head of Geodate, RWE

HIGH PERFORMANCE

The Tron is a **professional and high-performing UAV** offering outstanding efficiency and elegance. The system has been designed to **flexibly, quickly and safely integrate different sensors** in order to meet the needs of a variety of applications.

The **high quality standards** of Quantum-Systems GmbH, combined with the **extremely simple operating concept** and the high aerodynamic efficiency, make the system unique among all other existing drones. To meet these high demands, the Tron was designed from the outset as a fully electric transition aircraft.

Our transitioning technology combines long range and efficiency with the ability to vertically take-off and land without additional equipment.

The Tron's **robust and shock-absorbing cargo compartment** is able to securely accommodate even the most fragile payload, up to 2 kg (4.4 lbs). Thanks to our sophisticated **vertical take-off and landing capability**, the risk of damage is reduced drastically compared to competing fixed-wing systems.

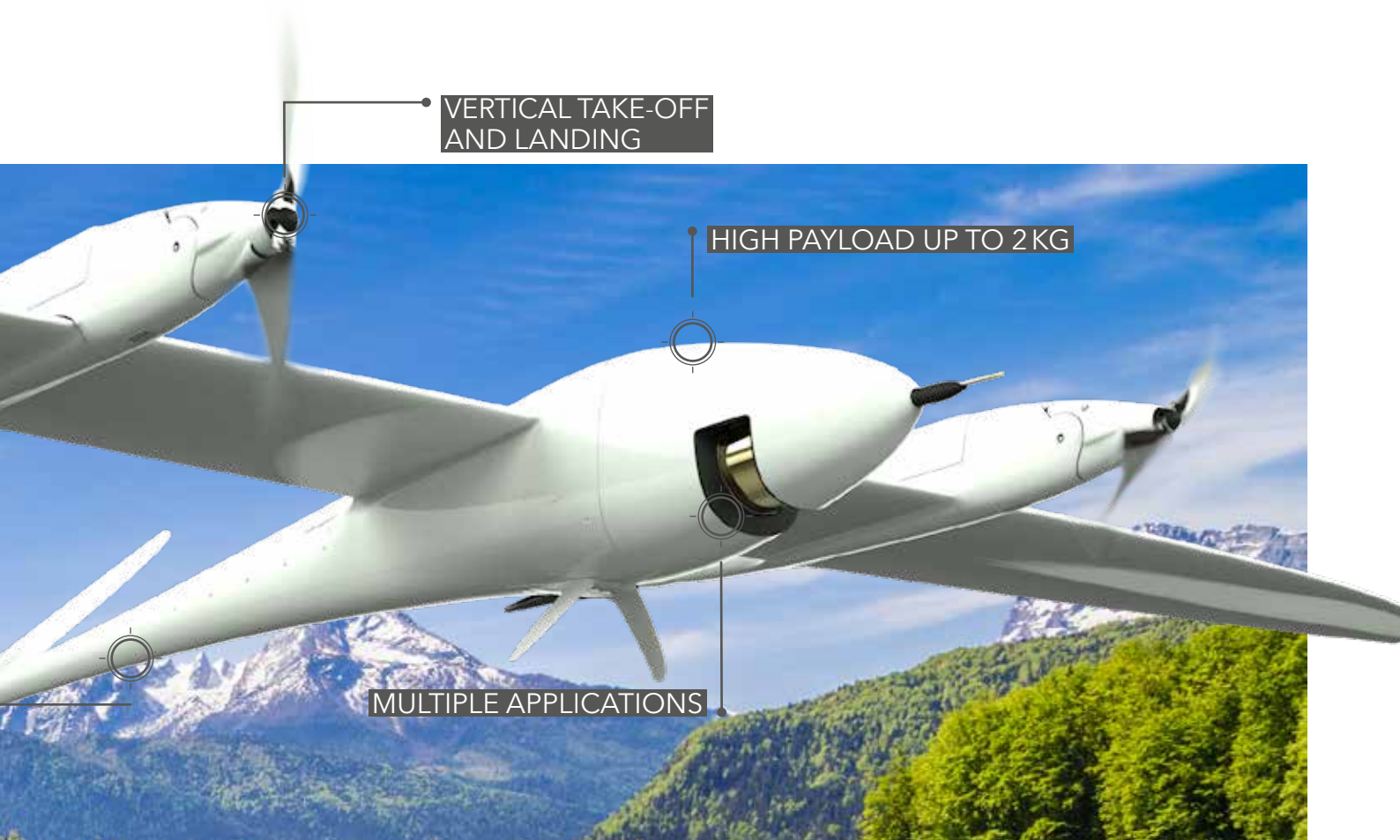
Combining VTOL and fixed-wing capabilities into one easy to use system gives you great flexibility. You have the

ability to map larger areas than has ever been possible with conventional multicopters. Our goal from the initial concept was to build a robust system by blending the best parts of both multicopters and airplanes into one simple system.

While the Trinity fits most use cases, the Tron is our **heavy-payload solution** for special applications.

Developed as an autonomous UAV for professional use, the Tron was built with **superior aerodynamics**. Our focus on in-house development such as our





VERTICAL TAKE-OFF AND LANDING

HIGH PAYLOAD UP TO 2 KG

MULTIPLE APPLICATIONS

own autopilot enables us to be in control of every subsystem and guarantee the highest performance with no drawbacks.

Combining VTOL and fixed-wing flight is more efficient and effective than a single system. The specifications of the Tron make it up to 100x more efficient than conventional multicopter systems. The combination of both systems result in less time necessary to complete a mission. ■

TECHNICAL DATA

Max. Take-off weight	13,5 kg (29.76 lbs)
Max. Flight time Tron60' / Tron90	60 min / 90 min
Payload	2 kg (4.4 lbs)
Cruise speed	18 m/s
Max. Range (100 m / 328 ft AGL)	90 km = 700 ha (55.9 mi = 2.7 sq.mi)
Max. Range (200 m / 656 ft AGL)	105 km = 1700 ha (65.2 mi = 6.6 sq.mi)

*no export permission required.

CUSTOMIZED COMPARTMENTS



DLR TUMBLE CAM



LASER SCANNER



TETRACAM MCA + FLIR + EO



QBASE

Our **self developed flight planning windows software** QBase makes it easier to achieve your goals by supporting you in the use of the systems Tron and Trinity. Cooperating with ESRI gives us the ability to integrate existing ESRI Data and define the flight area with a few clicks, on- and offline.

The **intuitive user interface** helps you to define your mission parameters in a few minutes. QBase automatically generates efficient flight paths after the flight area and the mission parameters have been defined with a few clicks, allowing you to be up and flying in no-time with our powerful and easy-to-use software. You are in complete control over your photogrammetric aerial survey mission and guaranteed full coverage over the area of interest.

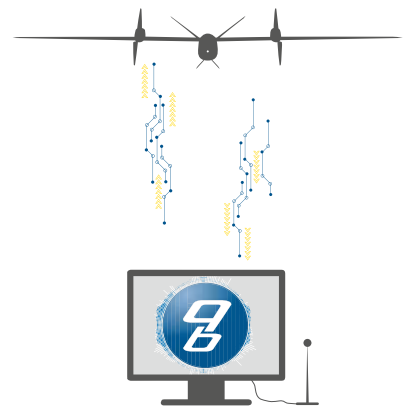
An additional feature is the **advanced Mission-Check which examines your mission and specified parameters** before the transfer of the mission to the UAV.



QBase provides **real-time information** from your Tron or Trinity. It also features an instrument panel that gives you updates on the altitude, speed, heading and battery health to help you evaluate your Quantum-Systems UAV status at any time.

Our QBase features a **two layer safety system** which ensures the success of your mission. The first safety check is integrated within QBase which performs a mission possibility check while you plan your mission. Once you transfer the mission to the UAV the integrated autopilot performs a second preflight check in order to ensure the mission can be successfully flown with the available UAV resources such as battery capacity, temperature or sensor status.

Quantum-Systems UAVs combined with QBase help surveyors, farmers, scientists, quarrymen, civil engineers and geologists to focus on their application, allowing them to just fly! ■



Qbase

- EASY FLIGHT PLANNING
- FLIGHT SIMULATION
- MISSION SAFETY EVALUATION
- FLIGHT DATA MONITORING
- BATTERY MONITORING
- SELF-DEVELOPED
- ESRI MAP DATA
- OFFLINE MODE



THE WORK FLOW



MISSION
PLANNING



UAV TAKE OFF



FLIGHT &
LANDING



DATA
PROCESSING

MISSION PREPARATION

Our QBase is the core instrument to plan your mission in advance. Select your payload, the preset for data accuracy and define your mission area in only minutes. QBase will calculate the mission including the necessary flight legs. The final mission check, integrated in QBase, ensures that all parameters are correct.

UAV TAKE-OFF

Place your Quantum-Systems UAV according to the setup procedure. After connecting the battery and booting the UAV you can transfer the mission wirelessly to the autopilot. In a second preflight check the autopilot will verify and approve the mission. The VTOL capability requires no additional equipment or interaction, just launch the system with the push of a single button.

FLIGHT & LANDING

While airborne, there is no pilot interaction necessary. If circumstances require you to alter the flight path (e.g. an evasive maneuver) you can do so by taking over manually with the RC transmitter - the drone will resume the mission afterwards. QBase always shows the UAVs telemetry data e.g. speed, position, state of battery charge to keep you up to date.

When landing, the drone will hover in 10 m (32.8 ft) above ground level until you decide for it to initiate the landing process. The VTOL mode guarantees soft landings without the risk of damage to the UAV or its sensors.

DATA PROCESSING

After landing, connect your PC to the UAV and download the fly logs via QBase. With the help of this data it is possible to geotag the imagery files on the SD-card(s) within QBase. The geotagged pictures are the basic framework for every data analysis with 3rd party programs. ■

TEAM QUANTUM



The Quantum-Systems team combines over 100 years of aviation and UAV engineering to bring the most advanced commercial VTOL drones to the world.

Quantum-Systems GmbH was founded in January 2015 and is specialized in the development and production of autonomous transition aircrafts for civilian use.

Our products combine efficiency and the ability to vertically take off and land without additional equipment.

Quantum-Systems manages to combine extensive experience and exper-

tise from all relevant areas of unmanned aerial systems. In 2008 the core team started to conduct research in the field of autonomous flight systems and by 2012 successfully completed the first autonomous transition.

Combining VTOL and fixed-wing capabilities into an easy to use system gives the user the freedom of choice regarding the operation area and the ability to map larger areas than with conven-

tional multicopters. Combining the two modes into one simple to use system was our goal at Quantum-Systems!

Quantum-Systems GmbH is managed by its owner. Thus, we are completely independent in our decision making. The combination of innovative power and uncompromising focus on quality make us the first choice in the area of transition flight. ■

COMPANY PROCESS



ORDERING PROCESS

TRINITY

- DAY 1-2** Order confirmation (incl. final testing of all systems, extended preflight check & test flight)
- DAY 3** Shipment to customer**



MANUFACTURING PROCESS

TRON

- DAY 1-3** Order confirmation
- DAY 3-5** Contact with customer
- DAY 5-8** Procurement of additional parts as needed*
- DAY 8-15** Installation of payload, electronics calibration & final assembling
- DAY 15-18** Final testing of all systems, extended preflight check & test flight
- DAY 19-20** Preparing for shipping, customs declaration
- DAY 21** Shipment to customer**



TESTING

Our UAV's undergo the following quality tests before they are shipped



Flight testing (preflight check, hover flight, test mission, postflight check)



12-month warranty



Frequent individual quality inspections



SHIPPING

We can ship our UAV's worldwide. Our UAV's are shipped in unique transport cases adapted to the shape of the UAV. You can use it for transport and storage of the unit.



INDUSTRIES



Mapping



Mining



Inspection



Monitoring



Forestry



Industrial



* depending on procurement time
** depending on country and custom process



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