

# Thread Systems

from model airplanes to a leading UAV manufacturer



Estonia-based Thread Systems is proud to claim the title of **Estonian leader in the field of Defence and Aerospace Engineering** - while there are bigger players in the Defence and Aerospace industry, Thread has found their niche in the combination of the two and have outranked their competition without any doubt. Thread's R&D and manufacturing facility in Viimsi near Estonia's capital Tallinn is the birthplace of their world class unmanned aerial vehicles and sensor systems, which are used for collecting information and for conducting ISR missions.

## THE ONE-STOP-SHOP PRINCIPLE

Thread Systems' **CEO Villiko Nurmoja** believes that Thread's competitive edge lies in the one-stop-shop principle of building UAVs for their clients, which gives them complete control of the engineering process making the systems more robust **"While others tend to act as systems integrators, buying various components from different manufacturers, we manage the entire design and production chain in-house, manufacturing all the composite material details for the aerial vehicles,"** says Nurmoja.

"Our goal is to develop and build as much as possible ourselves, because this way we can ensure perfect interoperability between all the systems. We only outsource the electro-optical OEM sensor kits for the gyrostabilized electro-optical gimbal systems, Utilizing their expertise. But everything else - from software to payloads and the tiniest details on the vehicle -, are made by us" notes Nurmoja. "Each UAV we manufacture is distinctly unique and needs to correspond to the specific demands and requirements of our clients. We start by choosing the appropriate sensor cores for the task, then start to work on the gyrostabilized payload and eventually build the aerial vehicle around this bundle. Thread's UAVs stand out for their flexibility and the possibility to expand functions, this sets us apart from our competition."



## A HOBBY TAKEN TO EXTREMES

Thread was born out of a hobby - the founders of the company had an interest in model airplanes and aeromodelling, this drove the passion and motivation to delve deeper into the development of unmanned aerial vehicles. The company was established in 2012 and at first, focused solely on product development, the first sales contract was reached three years later. **A major milestone in Thread's story was the development of an autopilot system together with the Estonian Ministry of Defence in 2014.** The autopilot system grants independence and flexibility to let the vehicle perform any function and task necessary. Another major advantage of the autopilot system is the possibility to practice the execution of the task before actually engaging in it.

## AMBITION IS THE PATH TO SUCCESS

"We have come a long way from our first white model aircraft to becoming a global UAV manufacturer and we are aiming to become the industry leaders in this sector in the next five years - we want to be the top choice for any government considering the purchase of unmanned aerial vehicles. And we shall achieve this by growing together with our customers in value co-creation," assures Nurmoja. Thread's 2400 square meter complex employs over 50 highly skilled professionals engaged with UAV development and production. "We do not sell UAVs as standalone products; we provide the customer with a fully integrated solution that we accept responsibility for during the entire life-cycle of the product. All our systems interact with each other and form a kind of neural network, this integrity is in fact our unique selling point," says Nurmoja.

## DIFFERENT PRODUCTS FOR DIFFERENT NEEDS

Today, Thread manufactures UAVs of different classifications, each designed to fulfil certain purposes. One of the more widely used models is the multi-rotor Titan, which can be used by border guards, police or rescue services, to provide essential support by delivering medical or rescue supplies to those in distress. The largest vehicle in Thread's portfolio is the fixed wing VTOL-enabled Stream C which has an operating range of 150 kilometres. The Stream C gimbal is able to discover a vehicle at 15 kilometres and a human recognition at 9 kilometres. This capability can be accomplished anytime day or night.. The whole system is operated by a team of four people, one in charge of navigating the aerial vehicle and the other manning the cameras and sensors, third and fourth

are ground crew to prepare and maintain the air vehicle. The equipment can be easily moved to any corner of the world in purpose-built containers developed by Threed, they offer complete use for maintenance, storage and command centres. The smallest Threed vehicle is the EOS and EOS C which uses an electric engine and has an operating range of 50 kilometres. This UAV can be used for performing a variety of functions in many different areas, from military use to property surveys, power line surveys, precision agriculture, forestry and environmental research. And other essential vertical markets.

### SO... WHAT NEXT?

The future holds many interesting challenges for Threed. **Nurmoja says that they are currently conducting a feasibility study to develop an even larger aerial vehicle.** "We are also working on improving navigational functions in situations where GPS-signals may be jammed or when there are unmanned and manned aerial vehicles operating side by side. Most likely we won't be seeing individual UAVs operating by themselves in the future, but rather flocks of UAVs performing different functions and tasks simultaneously," predicts Nurmoja.

### THE WORLD IS OUR OYSTER

The majority of Threed's customers are governments and their agencies, including Armed Forces law enforcement, rescue services and fire departments. Academic and research centers also increase the shopping window for the use of UAV's. **Threed has clients in 15 countries, from Africa to Indonesia.** "Our systems are in use for example in Kazakhstan, Ukraine, Greece, Cyprus, Estonia, Finland, France, Canada, United Arab Emirates etc. Threed

is already rather well-known in those countries with a stellar reputation, however there is the odd occasion where we still need to explain that Estonia is a member of the European Union and NATO. Our success as a digital nation is well-documented internationally, partly due to our achievements in e-governance and some major technology firms such as Skype and Bolt. **Our partners have also been impressed by the fact that Estonia managed to attract the most investments in startups per capita in 2018.**"

### GO-GETTING ATTITUDE + SYNERGY BETWEEN COMPANIES = SUCCESS

Nurmoja is convinced that Estonia is the best place for doing what Threed is doing, particularly thanks to the excellent workforce here. "We employ a number of seasoned engineers and are attracting young talent as well." Another major cornerstone for success in Estonia is cooperation with the government and the overall backing and forward thinking of Estonians. "Everyone from workers to public officials seem to have the attitude of let's go and do this! The intimacy that can only be found in small nations means that everybody knows one another, and this leads to very quick solutions and best practice to whatever problems may arise. People are rational and very eager to present intuitive suggestions for tackling challenges - it's always possible to think outside the box and come up with alternative solutions, thankfully there's very little learned helplessness around. Although we greatly cherish our partnership with the government, **I'm convinced that success can be reached through the synergy created by cooperation between companies,**" stresses Nurmoja.

