



In Conversation

In Conversation with Jack Williams and Carl-Thomas Schneider

Carol Baker

After the highly successful four day virtual event in June, HxGN LIVE Resiliency Series (<https://events.hexagon.com/Resiliency2021/home>) hosted by Hexagon's Safety, Infrastructure & Geospatial division (<https://www.hexagonsafetyinfrastructure.com/en-gb>) brought together experts and leaders from public safety, infrastructure, government, transportation and defence sectors, we talk to two of its speakers to hear more about how companies can adapt to disruption, overcome challenges, and be ready to face the future.

Jack Williams is Director of Industry and Portfolio Marketing for Hexagon's Safety, Infrastructure & Geospatial division. Jack is an experienced strategic product manager and R&D leader with a history of success bringing disruptive software products to market in multiple verticals, including public safety, physical security, and utilities and infrastructure. He works with teams worldwide and manages an R&D team in Sao Paulo, Brazil.

Jack is a highly energetic, passionate product management professional with skills in public speaking, international business development, artificial intelligence, middleware/interoperability, big data analytics, and more.

He has a Bachelor of Science in information systems from Fairmont State University and is an executive MBA student at The University of Pittsburgh.



Carl-Thomas Schneider is the Vice President, Business Development BLK247 for Hexagon's Geosystems division.

Carl-Thomas was founder and CEO of AICON 3D Systems GmbH, the German-based market leader in high precision optical 3D metrology for applications in automotive and aerospace industry.

After AICON became part of Hexagon's Manufacturing Intelligence division and after leading the integration into Hexagon, he took over the lead of the business unit for 3D Surveillance at Hexagon's Geosystems division.



Jack, can you give our audience some background on yourself?

I work with the Safety, Infrastructure & Geospatial division at Hexagon. We do a lot around public safety and emergency incident management, such as dispatch and communications. Additionally, we work closely with utilities, rail, and transportation organizations where we provide a variety of solutions ranging from incident management, through operational aspects, to geospatial digital twin simulations.



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My personal background consists primarily of technical roles in product management where I worked heavily with our emergency services and smart cities side of product development inside of Hexagon. I have a lot of experience with data integration and analytics, and I was the product manager for the first-of-its-kind assistive AI dispatch solution called Smart Advisor.

At the HxGN Live Resiliency Series, we hosted a session with Carl-Thomas and his team from Hexagon's Geosystems division where we discussed a Hexagon security and surveillance portfolio that can serve everything from a small mom-and-pop shop all the way up to an airport, even a city or a region – providing best of breed of technologies in security and surveillance, which we feel is unmatched in the marketplace.

Carl-Thomas, can you tell us a little about yourself?

Yes, of course. I ran my own business with a company of about 150 people before selling that business to Hexagon about six years ago.

About two and half years ago, the CEO of Hexagon's Geosystems division asked me to take over the business development of its new 3D security surveillance products. These are tools where you can scan the world, buildings, or whatever, in three dimensions. We realized early on, that this type of scanning technology could also be interesting for the security industry.

Traditionally, security cameras watch over a street or inside a building, but they only work in a way that if something happens, you review the video and decide what has happened, who was involved, and what they did. But it is challenging to work proactively with a camera.

For instance, the camera will see something (which it assumes is a person) enter an area, but that 'something' could also be an animal close by that has activated the camera. Or there may be bad lighting or a bad weather condition where it is really hard to identify what the 'something' was. This results in lots of false alarms because cameras look on something just in two dimensions, and you don't have any depth information.

We developed our scanner, the Leica BLK 24/7, to get full 3D information of everything around it. It is then very easy to detect whether an intruder is a human, or maybe just an animal. It detects the true size of all these items, so we immediately measure how big the 'intrusion' is, and say, OK, this is not a person. Therefore, the 'something' is not really dangerous.

We then put AI on top of this information, adding additional functionality that allows us to distinguish between a person or again, maybe any other kind of moving object. Having all this information together, gives us a very reliable answer.

So, whether a threat is done by a human or maybe by something completely different, what is really exciting is that it gives us a chance to proactively identify threats – and I am working on how we can leverage this new technology to create a more peaceful and safer world for everyone.



So, is the Leica BLK just a fancy camera?

Jack – Most definitely not. I think Carl-Thomas is underselling how cool the Leica BLK device is. The Leica BLK 24/7 gives you live data so that you get a true 3D aspect, mixed with AI and thermal imaging that gives you the ability to determine what the intrusion is.

For the industry, false alarms are a big problem. There is only so much you can do with video analytics and machine vision. But when combined with the Leica BLK thermal imaging capability and camera data, your false alarm rate goes down dramatically – and the ability to do perimeter and intrusion detection is amazing because you have that depth, that third dimension. It is a marvellous piece of engineering that Carl-Thomas' team are working on.

This technology is also ideal when sending in first responders. Hexagon has a history of providing comprehensive security solutions, and physical security solutions for large public entities and private entities, airports, ports, and borders and the like. Our new 3D technology can be used with our call taking and dispatching software to give call centre staff situational awareness for first responders.

For example, say you want to go to a campus or airport or a large office building, or maybe you have a lot of geographically dispersed buildings, and you want to centrally manage the physical security of those buildings from one command and control centre. You bring in our traditional security solutions which combines physical security, integration of sensors, devices, cameras, access control, badge readers, etc, converging all this siloed sensor and system data, bringing it into a common operating picture.

Taking this further to a city or regional level for major emergencies, let's say a hazardous material spill or a terrorism attack, or even a natural weather event where multiple people need to communicate, that's where our smart cities solution – HxGN Connect – creates a broad ecosystem of collaboration and coordinated action.

Whether it is from the mom-and-pop business, all the way up to the city level – we have software solutions. Add in our amazing 3D scanning and we marry up the best of breed hardware, software and AI combined at the edge, and we add some city-wide and regional-wide collaboration capabilities, then we create something which is revolutionary in the marketplace.

Carl-Thomas – Let me add something to that. There are of course, other LiDAR scanner sensors on the market, but they are not dedicated for security applications, they're usually made for automotive applications such as autonomous driving. It also means that they have a very small field of view, because they only have to look at what's in front on the roads – so just two metres in height, and not very far ahead.

Whilst this is a similar technology, we have made it in a way that we can really observe half sphere with 60 metres in diameter which allows us to observe a very big area.



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We also have another software package where we can actually deep deploy every kind of LiDAR sensor. But this 3D technology inside the security industry is really something new and disruptive. It means we can autonomously observe areas and detect threats, and only in the case of a real threat do some actions need to be taken.

False alarms really cost a lot of money in the industry because you have to go out there and look at what's going on. For instance, in smaller units or private homes, if you have two or three false alarms, people always get a big shock because the alarms start, then they get so frustrated that they switch the alarms off because it is more threatening if they have a false alarm. Even in these situations we can help as our system is very reliable and autonomous in the alarming.

Can you give us some examples of its use in real life situations?

Jack – If we look at the rail industry, for example, we have a lot of customers across the Hexagon group at the national railway level handling passengers and freight in Europe, Canada and the US.

Consider intrusion detection for tunnel entry monitoring, where unauthorized persons enter a tunnel, commit vandalism or leave things on the tracks. These all pose a threat, requiring parts of the network to be shut down.

As Carl-Thomas said, control rooms are typically monitoring a bank of cameras, and there is only so much you can manually catch. Now imagine if you have some well positioned BLK's proactively monitoring the tunnel, giving you the ability to assess an alarm, acknowledge or dismiss it and alert the necessary local law enforcement if needed. Or imagine it is not a criminal activity that is taking place, but maybe it's an accidental train derailment or a bridge strike, the system will send fire and rescue services out.

Taking that further, imagine you have a hazardous material spill that could be very dangerous, and you have to start notifying other agencies, including the community around the area. That could include a lot of people so you might have to dynamically communicate with organizations, entities in the public, the rail industry, etc. This is where the Leica BLK feeds into our HxGN Connect system.

Carl-Thomas – Another example is if we look at banks. Using the BLK 24/7 in banks and bank vaults is interesting because even though you are scanning everything in 3D, and you can detect whether a person is around, the privacy function within our software can be set so that whilst we cannot identify what the person is putting in a box, the bank knows that someone is in the bank vault. This perfectly matches with the privacy regulations bank vault users want.

When it comes to perimeter protection, standard systems just check if someone goes over the fence or goes through it, but what we do in addition to this is monitor around the whole area. We can see if there is a person who is inside an object, track that person or persons, and see wherever the object goes – which is especially useful at airports and ports.



Then for private homes we can define ‘zones’ around a house. For example, we can protect the swimming pool during the night. You can check whether someone is close to the pool and start an alarm. This alarm will not be created if, for instance, the neighbour’s dog is running around, or if it starts snowing – which can happen with traditional systems.

Add to that its use around critical infrastructure such as data centres. You need to know who goes in, where they move inside, and especially where they are going. If a person goes in, you want to exactly identify in front of which rack the person is standing – not just seeing that a person has gone in. With the BLK 24/7 we get the complete three-dimensional information of what’s going on.

Another example is when we look at the power grid, especially electrical substations. Typically, they are somewhere far away from cities or remotely located, and there is risk of people destroying these or entering these electrical substations resulting in a blackout somewhere. You need to be able to check it with cameras because you may get a false alarm and send people out, but with the BLK 24/7, we are able to clearly identify whether it’s a human that’s inside these substations or whether it’s something else.

How do you see the security market changing?

Carl-Thomas – When it comes to video camera usage in the security industry, we expect the number of cameras will continuously grow, but in ten years’ time, we estimate that around 20% of these old cameras will need to be supported with 3D information. So, we don’t see video cameras being replaced, but technology such as the Hexagon Leica BLK 24/7 will add 3D functionality to them.

I am excited about all this technology and especially its use of AI. Being able to distinguish between a person and a non-person is a new technology, and it’s fantastic what we can do with it.

Jack – We are driving an autonomous future. Don’t you agree, Carl-Thomas?

Carl-Thomas – Yes. Hexagon itself is involved in many different industries where autonomy is becoming a big value. This is visible in traffic where you will have cars without a driver or trains without a driver – and all this needs a network and IT infrastructure that runs. This is where Hexagon is playing a major role, providing data and information that is needed to do these things autonomously.

Jack – I would add that in the security and public safety space we are big believers in keeping humans in the loop. There are some things where human judgement, we believe, will stay at the forefront.

If we take a step back and look at Hexagon as a whole – from a business model perspective where are we going? Something found throughout Hexagon is that we believe we can create a sustainable future.



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Sustainability is a big effort, and we don't believe that sustainability should be seen as a negative or a cost – we believe that it is a good business model. To be sustainable requires a lot of autonomous behaviour, optimization and efficiency. So that is very key, and the heart of where Hexagon's at.