A Year After the Nanotech Acquisition: Optical Innovation at Authentix

July 2025 marked a year since Authentix finalised the acquisition of the authentication operations of the Canadian group Meta Materials, which centred around Nanotech Security Corp (NSC), for approximately $10 million. NSC is a specialist in nanostructured functional films, including the Lumachrome® security feature, which is used in more than 30 banknote denominations worldwide, LiveOptik™ PROTECT, a security foil developed for the brand protection market and QUANTUM® Stripe – the world's first fully animated nano optic and plasmonic banknote security feature.

The acquisition has significantly enhanced Authentix's capabilities in offering unique, innovative security solutions, helping to solidify its position in authentication, security and anti-counterfeiting. In this interview, we spoke with Alan Newman, Chief Product Officer, to discuss the implications for holography, the broader optical technology landscape, and the future of secure features.

Q: *Alan, thank you for joining us. Could you start by sharing how you became involved in the field of holography and optical security? What inspired your journey into this industry?*

A: I've been involved in the banknote industry for approaching 40 years, 18 of those in various operation roles for the Bank of England in the production of sterling currency, and 18 years with De La Rue in production, design and as Product Director responsible for the development and introduction of new security features and platform technology for the authentication of currency. Most recently I was responsible for the authentication division of Meta Materials, and led the sale of the assets to Authentix.

My background includes design, production and security feature development, fundamentally to this has been the integration of various optical technologies for level 1 public recognition features.

Also during this time, I have seen just a few significant platform technologies that have changed the industry and become key level 1 security feature platforms. What excites me today is being part of the journey to launch the next core security feature platform with nano optics, which is suitable for not only currency , but brand and identity solutions as well.

Q: *Throughout your career, what have been the most notable shifts in the holography and authentication sectors? How has Authentix evolved in response?*

A: From a currency perspective I've seen the technological improvement from embossed foil applied to the sterling £50 series E, to complex demetallised two sided holograms which took a period of dominance in the currency market in the early 2000s.

The increased deployment of polymer substrates gave life to holograms with the smooth polymer surface enhancing the optical reflectance, and the use of polymer windows enabling holograms to be viewed from the front and back of the note.

Most recently I've observed an increase in issuance of micro optics lens based security features that are replacing holographic features in currency, and micro optics starting to have uptake on brand security authentication labels.

Until the acquisition of the nano optic portfolio from Meta Materials, Authentix had primarily been positioned in the covert level 3 security feature market. This acquisition has now enabled us to quickly position ourselves as a leader in nano optic security features, and couple this with Authentix wider portfolio in currency, brand and – soon – identity.

Q: *How would you describe Authentix's current capabilities in the areas of holography, nano-optics, and other optical security technologies? What distinguishes your portfolio from others?*

A: Authentix is well placed in the market to offer optimal technology platforms across currency, brand and identity, with manufacturing capacity from our security feature plant in Quebec, Canada for all of their optical security technologies.

Authentix's portfolio specialises in platform technologies which meet the customers' needs across each business vertical. PVD colour shifting material through Lumachrome®, top tier diffractive devices that utilise nanostructures in LiveOptik™ and the new nano optic plasmonic feature QUANTUM® stripe.

Q: *So it was the acquisition of Nanotech Security that gave Authentix its portfolio of level 1 optical features. How specifically do these technologies strengthen your offerings for the three verticals you identify?*

A: These level 1 security features position the Authentix portfolio optimally to offer customers the right solution for their authentication needs.

Within Currency, we offer colour PVD functional film for conversion into banknote threads or our new nano optic plasmonic feature QUANTUM stripe for the latest generation of currency protection. Quantum is the next generation security feature, compatible with all currency substrates, offering unique public engagement and integration within the banknote design.

In addition to this level 1 security feature suite, we offer our level 3 taggant Jewel™, the flexible level 3 solution on the market, together with the necessary detectors compatible with all single note examination equipment on the market.

In Brand, our nano optic plasmonic feature NANO™ protect offers banknote grade security features into labels, which can be accompanied by our digital track and trace solution DigiTrax™ for full physical and digital authentication. In addition, LiveOptik security films and labels can be customised to customers' design and functional preferences to include multi-colour, 3D depth, vivid motion, and image switching, format films, and converted labels.

Authentix already has a strong position in identity and other government secure documents through our security print work for visas and passports at Royal Joh Enschedé and also proven Lumachrome® applications for ID cards. However, in the coming months, this is set to expand – PICO™ secure will be launching in the coming months, where we will be the first to embed nano optic plasmonic structures into polycarbonate.

Q: *Regarding market strategy, how does Authentix deliver its optical security features for each vertical? Do you engage directly with central banks, or do you primarily work through integrators and suppliers?*

A: We operate flexibly to meet market needs, always starting with the customer's objectives and the unique challenges of their program. In many instances, we work directly with issuing authorities or government entities, collaborating from the earliest stage through to implementation and post-issuance performance analysis. This ensures the solution is not only technically robust but also aligned with the customer's operational realities and long-term goals.

In other cases, we partner with integrators or, as the overall integrator, with printers and OEM suppliers to embed our technologies seamlessly into existing production and distribution processes.

These relationships are built on mutual trust and a shared commitment to protecting

the integrity of our clients' products, documents, and reputations.

Our reputation in the industry comes from that collaborative approach and a 'customer-first' mindset. We don't just provide a feature; we work alongside our partners to design the right solution, integrate it effectively, and stand behind it throughout its lifecycle.

Q: *If we look at QUANTUM stripe and more specifically nano optic and plasmonic effects; What role do you see them playing in the future of secure design? Are your technologies scalable and cost-effective?*

A: These effects represent the next generation of optical security. They offer greater resistance to counterfeiting than traditional holography and open new creative possibilities for designers. Some of the benefits of QUANTUM can be described as follows:

- Fully customisable
- Multi-colour design and multi-directional movement effects
- Simple, intuitive authentication
- Highly visible, easily triggered movements and effects
- 'Always on colour' – unambiguous plasmonic colour and wide viewing angle even in poor lighting conditions
- True integration – seamless design possibilities compatible with multiple substrates and standard industry application equipment
- Sustainable – less material, no inks, dyes or pigments in its construction.

With over 10 years in development, QUANTUM stripe offers a stable, new, secure platform with true integration into the cash cycle and the banknote manufacturing ecosystem. Our development has focused on ensuring a seamless integration into banknote printing sites, compatible with all print and post print processes, and applied without requiring equipment modification to paper or polymer substrates.

By the end of 2025 we will have capacity for 5 billion banknote security features per annum, with full qualification testing undertaken by our partners and durability testing by 3rd party laboratories to euro specification.

I see QUANTUM as the next generation level 1 security feature for new banknote series, or indeed where existing banknotes require a security or, in some cases, even a durability upgrade mid cycle.

Fundamentally, we envision our nano optics platform playing a central role in secure design over the next decade and beyond, especially as governments and issuing authorities demand higher security, greater flexibility, and improved functionality from their features.

Q: *Looking ahead, how do you see the role of optical technologies evolving in the security ecosystem? Where do you think the next big breakthroughs will come from – whether in material science, integration with digital tools, or new application areas?*

A: Nano optic plasmonic security features are the next big step, and they are about to be as significant as the major security feature platforms we have seen introduced since the 1940s. Since then, almost all security features have been based on three core technologies: holographic, colour shift, and micro optics. The next platform to lead us for the next 25 years will be nano optics.

We have an innovation roadmap that will guide us through the next 20 years, which encompasses further material science development and integration beyond merely an applied stripe, patch, or banknote thread.

We are already able to utilise our GemVision™ fitness sensors to view QUANTUM® stripe structures for fitness and authentication; this will be the first fully machine readable level 1 security feature which truly looks at the optical effects.

Additionally, the structures enable complete integration into polycarbonate, which in turn provides suitability for Identity solutions into ID cards and Passport data pages.

Q: *As the boundaries between physical and digital security blur, how is Authentix preparing to integrate optical features with data-driven or connected technologies?*

A: Physical and digital security are already converging in many Authentix programs. For example, we recently produced the world's first series of physical notes backed by cryptocurrency. In addition, our full brand protection solution blends physical and digital security via our optical security, DigiTrax™ track and trace and BrandTrax™ online brand protection platforms.

With our background and core capabilities in machine-readable digital intelligence and, now, optical features, we can begin to build platforms that extend optical features beyond mere visual checks.

I already mentioned that our GemVision and camera systems have the capability to not only check the fitness of our technologies but actually authenticate at banknote sorting speed. This can support issuing authorities with real data and intelligence on the performance of the features.

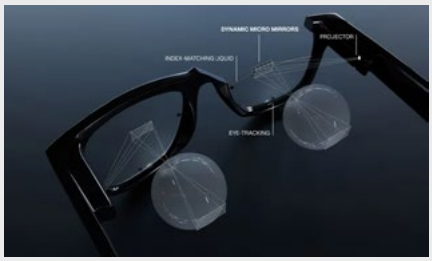
The future is then, how can this be pushed further to support the end user – the general public? This could be in the form of unique identifiers, personalisation or even digital twin fingerprinting to counter simulation attempts.

We've got the toolkit, the experience, and the scale to make that convergence real – and we're already well down that road.

Gixel Secures €5M for Advanced Optical Displays in AI and AR Glasses

German startup Gixel has raised €5 million in seed funding to develop next-generation optical see-through displays for AI and augmented reality (AR) eyewear.

This funding round was led by Brendan Iribe, Co-Founder of Oculus VR, Ted Schilowitz, former Chief Futurist at 20th Century Fox and Paramount, and FlixBus founders Jochen Engert, Daniel Kraus, and André Schwämmlein. Additional backing came from Germany's Federal Agency for Disruptive Innovation (SPRIND) and early-stage VC firm LEA Partners.



As AI-powered vision and voice technologies rapidly advance, tech giants are racing to deliver mainstream AR glasses. The main challenge has remained creating lightweight, energy-efficient optical displays with high-quality visuals. Gixel's patented technology aims to overcome this barrier by providing scalable, modular solutions ideal for today's AI glasses and tomorrow's immersive AR experiences.

Gixel says its displays offer smartphone-level image quality, exceptional transparency when turned off, and ultra-low energy consumption, heat output, and weight. Its flexible design is engineered for mass production, allowing manufacturers to incorporate curved lenses, adjustable focal planes, and customizable fields of view – from specific zones to complete lens coverage.

Founded in 2019 by Dr Miro Taphanel, Dr Ding Luo, and entrepreneur Felix Nienstaedt, Gixel has a team of 15 specialists in relevant fields.

CEO Felix Nienstaedt said: 'we're making the breakthrough that finally brings wearable AI and AR to reality'. A prototype and developer kits are in development, with a Series A funding round planned for 2026 to scale manufacturing'.