

AUTHENTIX

From Next-Generation Security
Features to Artificial Intelligence:

Redefining the Banknote
Security Lifecycle

FACT SHEET

- **Closing the Gap Between Physical and Digital Threats:**
Authentix combines next-generation overt security with AI-driven intelligence to address both traditional counterfeiting and the rapid growth of online illicit currency distribution.
- **CashTrax™:**
An AI-powered platform delivering real-time visibility of counterfeit activity across online marketplaces, social media, and the dark web, supported by a global network of analysts.
- **QUANTUM stripe™:**
A nano-optic platform based on plasmonic structural colour, enabling highly dynamic, always-on visual effects without pigments or dyes.
- **Introducing Multi-Frame Animation in Security Features:**
QUANTUM stripe now delivers smooth, frame-by-frame animation, transforming overt features into intuitive, engaging authentication tools that are extremely difficult to replicate.
- **Integrated End-to-End Security Approach:**
From concept design through production, circulation, and post-issuance intelligence, Authentix provides a supplier-neutral, issuer-focused model supporting over 25 central banks worldwide.

FROM NEXT-GENERATION SECURITY FEATURES TO ARTIFICIAL INTELLIGENCE: REDEFINING THE BANKNOTE SECURITY LIFECYCLE

Recent industry dialogue has made one point increasingly clear: central banks are no longer looking for incremental improvements in banknote security; they are demanding a step change.

Findings presented in recent Banknote Industry News (BIN) survey highlight a growing expectation from issuing authorities for next-generation overt security features (OVDs) that are both intuitive for the public and resilient against increasingly sophisticated counterfeiting techniques. At the same time, the threat landscape itself is evolving, beyond the physical notes. Counterfeiters are no longer confined to traditional production and distribution channels; they are highly active online, leveraging marketplaces, social platforms, and even encrypted environments to distribute illicit currency products at scale.

This dual challenge of advancing physical security while countering digital proliferation could be reshaping how central banks approach the entire banknote lifecycle.

A NEUTRAL, END-TO-END APPROACH

Against this backdrop, the role of independent, issuer-focused support has never been more critical.

Authentix supports issuing authorities at every stage of the journey to a new or upgraded banknote or series. With >25 central banks and issuing authorities worldwide trusting its expertise, Authentix is uniquely positioned to help governments design and produce highly secure currency, reduce the availability of falsified banknotes and coins sold online, and support effective offline enforcement actions. From early design and concept strategy through origination, production oversight, circulation, and post-issuance analysis.

Unlike traditional suppliers, this model is intentionally issuer-first and supplier-neutral, designed to help central banks’ balance security, durability, cost, efficiency, usability, and public confidence without bias toward any particular material, printer, or feature provider.

This continuity across the lifecycle is particularly important in today’s environment.



QUANTUM STRIPE: DELIVERING SMOOTH, NATURAL MULTI-FRAME ANIMATION

Security decisions made at the design stage must now account not only for print and production constraints, but also for long-term counterfeit intelligence, circulation performance, and emerging digital threats.

To support this shift, Authentix has expanded its portfolio with a set of integrated solutions, bridging physical security innovation with data-driven intelligence. Two of the most significant recent developments are **CashTrax™**, a digital intelligence platform, and **QUANTUM stripe™**, a next-generation nano-optic overt feature. Both designed to close critical gaps in the modern banknote security ecosystem.

CASHTRAX™: EXTENDING BANKNOTE PROTECTION INTO THE DIGITAL DOMAIN

While anti-counterfeiting strategies have historically centered on physical enforcement; raids, seizures, and forensic analysis, this approach is increasingly insufficient in a digitally enabled threat environment.

CashTrax™ has been developed specifically to address this gap as the first AI-powered online counterfeit detection service designed exclusively for the currency industry. The platform provides central banks with continuous visibility into online counterfeit activity both in the clear net and dark web, across global marketplaces, social media platforms, and emerging digital channels, supported by a combination of AI-driven analysis and human intelligence from a global analyst network.

Crucially, CashTrax moves beyond passive monitoring to enable active enforcement workflows, identifying, tracking, and supporting the removal of counterfeit listings



CASHTRAX REAL-TIME VISIBILITY OF COUNTERFEIT ACTIVITY

while building a structured dataset of evolving threats. At its core, CashTrax delivers six key capabilities that distinguish it within the industry:

1. Comprehensive Detection and Identification

The platform identifies infringing materials across a wide range of digital environments, including marketplaces, standalone websites, and social media platforms, providing detailed records of counterfeit listings and associated actors.

2. Full Transparency of Threat Sources

CashTrax provides clear attribution of where counterfeit materials are being offered, giving central banks visibility into specific platforms, sellers, and networks involved in illicit trade.

3. Structured Enforcement Actions

The platform delivers recommended and executed takedown actions, enabling efficient removal of illicit listings and improving coordination of evidence for both platform operators and further law enforcement partners when necessary.

4. Continuous Status and Workflow Tracking

Central banks receive ongoing updates on removal activities, enforcement status, and engagement outcomes, transforming isolated actions into a structured, trackable program.

5. Intelligence-Led Trend Analysis

By aggregating findings over time, CashTrax identifies high-value targets, emerging counterfeiting patterns, and systemic vulnerabilities, supporting proactive decision-making rather than reactive enforcement.

6. Public Education and Policy Support

Insights derived from the platform can be used to support public awareness initiatives and to inform future banknote design and security feature selection.

Importantly, CashTrax is not positioned as a standalone service but as a core intelligence layer within the banknote lifecycle, creating a feedback loop between real-world threats and future design decisions. This is particularly relevant in areas such as security feature selection, where empirical counterfeit data can now guide strategic choices.

From an operational perspective, the platform has also been designed for rapid deployment, with onboarding typically completed in weeks rather than months, an important consideration given the pace at which digital threats evolve.

DESIGNING SECURITY FROM THE FOUNDATION: QUANTUM STRIPE™

If CashTrax represents the intelligence layer, **QUANTUM stripe™** represents the next evolution in overt security design.

Despite decades of innovation, most banknote security features still rely on a limited set of core technologies; colour-shift, holography, and micro-optics, creating a degree of predictability that sophisticated counterfeiters increasingly exploit.

QUANTUM stripe™ introduces a fundamentally new approach based on nano-optic, plasmonic structural colour, enabling dynamic visual effects without the use of pigments or dyes. Now this technology creates always-on animation effects, delivering intuitive, highly engaging authentication that is both easy for the public to recognize and extremely difficult to replicate.

Key benefits include:

- **Counterfeit resilience**, driven by nanoscale origination and proprietary manufacturing processes
- **Seamless integration** across substrates and production workflows without requiring fundamental process changes
- **Ease of authentication**, with visible effects at any angle, even in poor lighting conditions. Including the ability to authenticate using Authentix High Speed sensors
- **Durability**, supported by encapsulated structures suitable for real-world circulation

- **Sustainability**, eliminating reliance on inks or dyes

Critically, QUANTUM stripe™ is not a single feature but a platform for ongoing development, enabling future expansion in animation complexity, colour range, and potential machine-readable integration.

FROM CONCEPT TO REALITY: THE “TIME IN MOTION” HOUSENOTE

The capabilities of QUANTUM stripe™ are demonstrated in the “Time in Motion” housenote, a collaborative project bringing together Authentix, Kurz, Koenig & Bauer Banknote Solutions, and LandQart. This housenote represents more than a technical showcase, it is a production-ready demonstration of integrated design, material science, and security innovation.

At its core is the launch of multi-frame animation effects, moving beyond simple transitions to create seamless, intuitive motion aligned with the banknote’s visual narrative. Importantly, the housenote confirms that these advanced features are compatible with existing industrial printing environments, reinforcing their viability for real-world adoption.

COMPLETING THE STACK: THE ROLE OF LEVEL 3 SECURITY

While overt features play a critical role in public authentication, they must be complemented by robust system-level protection.

JEWEL™, Authentix’s Level 3 covert authentication solution, provides this final layer - delivering machine-readable, invisible security that remains effective throughout the entire lifecycle of a banknote. Produced within Authentix’s secure facilities, JEWEL benefits from a tightly controlled and trusted supply chain, ensuring integrity from material creation through to implementation.

As a highly flexible Level 3 solution, JEWEL can be tailored to meet the demands of any banknote specification and support the decisions of Central Banks and issuing authorities; substrate selection (polymer, paper or composites), whether integrated directly into the substrate or applied via inks, overprint varnishes, or a combination of approaches. This flexibility extends through to inspection, supporting both offline quality control environments and high-speed processing systems without compromise.



JEWEL enables advanced counterfeit detection, including altered or composite notes, while remaining fully compatible with high-throughput authentication platforms.

Together, these elements—overt innovation, covert security, and digital intelligence—form a cohesive, future-ready security framework.

A NEW MODEL FOR BANKNOTE SECURITY

What is emerging is a shift from isolated solutions toward an integrated, data-driven model:

- **Design informed by intelligence** (via CashTrax)
- **Security engineered at the foundation** (via QUANTUM stripe™)
- **System-level resilience ensured through covert detection** (via JEWEL™)

This approach creates a continuous improvement loop, where insights from circulation and online environments directly inform the next generation of banknote design.



MOVING FORWARD: AN INVITATION TO EARLY ADOPTERS

The opportunity for issuing authorities is increasingly evident. For central banks seeking to stay ahead of evolving threats, a number of immediate entry points are available:

- Book a live CashTrax™ demonstration to explore real-time counterfeit intelligence and enforcement workflows
- Initiate a minimum-scope scan (“min-scan”) to assess current online exposure and threat levels
- Request QUANTUM stripe™ sample materials, including the “Time in Motion” housenote, to evaluate next-generation overt security in a physical format

These steps are intended not as theoretical explorations, but as practical starting points - enabling central banks to test, validate, and implement new capabilities within their own frameworks.

As the threat landscape becomes more complex and interconnected, many central banks are placing increasing emphasis on integration over isolation, intelligence over assumption, and innovation grounded in real-world performance.

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A NEW MODEL FOR BANKNOTE SECURITY



QUANTUM stripe™

Time in Motion Housenote

**Welcome to a new era of banknote innovation
where Art, Science, and Security converge**

- ✓ Fully Industrialized Banknote Solution
- ✓ Plasmonic structural color, multi-frame nano-optic animation
- ✓ Engineered to resist replication
- ✓ Seamlessly integrates into existing banknote production workflows

Rotational cogs reveal
denominational text
when turning

Sand flows through the
hourglass revealing
denominational text



Multi-color nano optics,
metallic “Frost” effect and
demetallized stripe

Disappearance and
reappearance of text as
pendulum swings