

# Revolutionizing Financial Services Infrastructure with CXL® Technology

SMART Modular's Compute Express Link® (CXL®) memory solutions are transforming the landscape of fintech and high-frequency trading by addressing critical challenges in financial data processing. Our innovative memory technologies enable financial institutions to break through traditional computational limitations, delivering unprecedented performance, scalability, and cost-effectiveness.

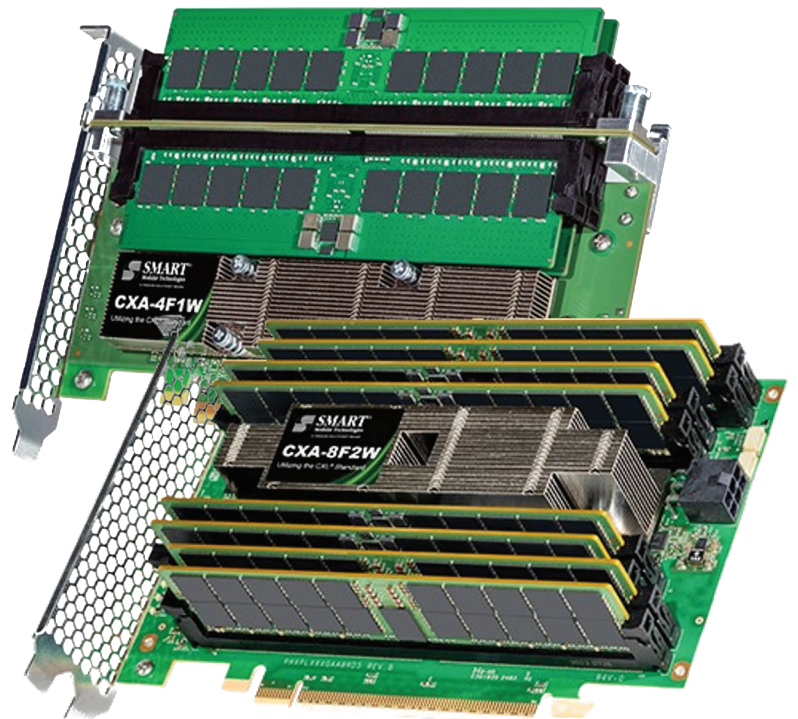
SMART's memory solutions utilizing CXL transform how financial organizations can leverage data, turning information into competitive insights faster.

## What is CXL Technology?

Compute Express Link (CXL) is an open standard that redefines how servers manage memory and compute resources. By enabling high-speed, low-latency connections between CPUs and memory, CXL eliminates traditional bottlenecks in data processing, unlocking new levels of scalability and performance for data-intensive workloads. In financial services, where speed and accuracy drive competitive advantage, CXL delivers game-changing benefits:

- **Faster Data Processing:** Real-time analysis of massive datasets with minimal delay.
- **Improved Infrastructure Efficiency:** Optimize resource utilization while reducing operational costs.
- **Scalable, Future-Proof Solutions:** Seamlessly expand memory to meet evolving data demands without costly infrastructure overhauls.

SMART Modular's CXL memory solutions are helping financial institutions transform their IT infrastructure to meet the growing demands of high-frequency trading (HFT), real-time risk modeling, and AI-driven analytics.



SMART Modular PCIe CXL Add-in Cards (AIC)

## Advantages of CXL for FinTech

Financial institutions face increasingly complex computational demands. Our memory solutions using CXL technology provides a strategic advantage:

### 1. Scalable Memory Expansion

The financial industry's data demands continue to grow exponentially. Traditional server architectures are limited by CPU-bound memory capacity, leading to inefficiencies and bottlenecks. CXL solves this problem by decoupling memory from the CPU, allowing organizations to expand capacity up to 2TB per server without adding additional processors. This means:

- **Cost-Efficient Scaling:** No need for full server upgrades—expand memory using existing PCIe slots.
- **Reduced Power Consumption:** Fewer CPUs mean lower energy use and operating costs.
- **Future-Proof Flexibility:** Scale memory incrementally as data demands grow.

### 2. Ultra-Low Latency for High-Frequency Trading (HFT)

In high-frequency trading, milliseconds matter. SMART's CXL solutions offer ultra-low latency, approaching that of direct-attached DRAM, ensuring trading algorithms execute without delay. The main performance highlights are:

- **Up to 82% Increase in System Bandwidth:** Reduces data bottlenecks and accelerates application performance.
- **Optimized for Millisecond-Critical Workloads:** Ensures real-time responsiveness for HFT platforms.

### 3. Enhanced AI and Machine Learning for Financial Modeling

CXL's high-bandwidth memory improves performance for AI and machine learning workloads, enabling more accurate predictive modeling and faster fraud detection. With larger memory pools and reduced latency, financial institutions can accelerate training times and enhance model precision.

## SMART's Solution

SMART Modular's CXL memory solutions offer a powerful combination of scalability, performance, and cost efficiency, redefining financial infrastructure in high-frequency trading (HFT), AI-driven analytics, and real-time risk modeling. By expanding memory capacity our solutions help financial institutions break through traditional computational limitations. Our current offering of advanced memory expansion solutions consists of a 4-DIMM Add-In-Card (AIC), an 8-DIMM AIC, and a CMM memory module in an E3.S form factor, all utilizing the CXL 2.0 standard.

## SMART Add-In Cards: Unlocking Flexible Memory Expansion

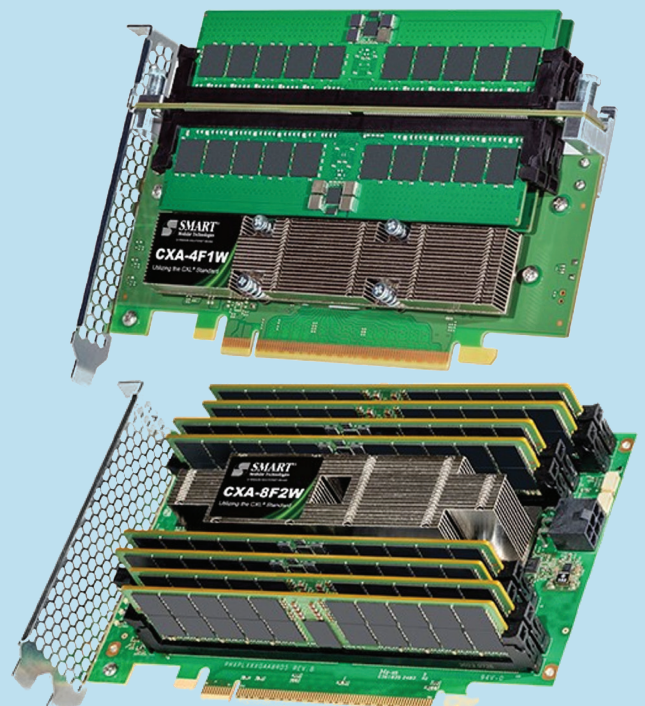
SMART Modular's Add-In Cards (AICs) are a core component of our CXL offering for FinTech, designed for high-performance environments like high-frequency trading and AI-driven financial analysis.

### Why Choose SMART AICs for Financial Infrastructure?

- **Flexible and Modular Memory Expansion:** Use standard PCIe slots to scale memory capacity on demand.
- **Increased CPU Utilization:** Maximize CPU bandwidth and improve overall server performance.
- **Cost-Efficient Scaling:** Expand memory without investing in new servers or CPUs.

### SMART AIC Product Highlights:

- **Single-Width Cards with 4 RDIMMs** supporting up to 512GB memory
- **Dual-Width Cards with 8 RDIMMs** expanding to 1TB memory capacity
- **PCIe Gen5 Compatibility** for seamless integration with next-generation server architectures
- **Support for both DDR5 and DDR4 DRAM RDIMMs**
- **Ultra-Low Latency Design** crucial for millisecond-critical trading environments



# Penguin Solutions: Advanced Server and Rack Infrastructure for FinTech

Penguin Solutions complements SMART's advanced memory expansion catalog with robust server infrastructure, chassis and rack specifically designed for financial computing. Penguin's high-density rack solutions offer unprecedented memory expansion capabilities:

- Chassis Scale Scale-up CXL server that expands memory up to 11TB per server
- Rack Scale Scale-out CXL solution that expands shared memory up to 220TB per 32-server rack
- SMART 128GB DDR5 RDIMM-based AICs fully validated and supported by Penguin on server platform
- Flexible deployment options for diverse financial workloads, optimized for high-frequency trading and complex financial algorithms.

By integrating SMART Modular's AICs, Penguin's servers provide financial institutions with scalable, high-performance computing platforms that can adapt to rapidly changing market conditions. The solution eliminates traditional memory constraints, enabling real-time processing of massive datasets with unprecedented efficiency.

SMART Modular Technologies is a Penguin Solution's brand.

## Performance Beyond Boundaries

Expanding memory capacity without adding CPUs is a game-changer for financial institutions, driving significant cost savings and improving power efficiency. SMART Modular's memory solutions utilizing CXL increase capacity while reducing latency, enabling real-time processing of large financial datasets, faster execution of complex trading algorithms, and enhanced risk modeling and fraud detection. These benefits extend to in-memory databases and advanced analytics, ensuring organizations can seamlessly scale to meet fluctuating market demands without compromising performance.

In an industry where milliseconds matter, SMART's advanced memory solutions using CXL eliminates traditional memory bottlenecks. Contact a SMART representative to learn more about how SMART Modular's portfolio of products using CXL can transform your financial infrastructure.

## The Broadest Portfolio of Serial Memory Expansion Solutions Utilizing CXL

CXL Specification 2.0 / CXL.mem Type 3

### E3.S EDSFF 2T Modules with DDR5\*

<b>CMM-E3S</b>	E3.S	64GB / 96GB / 128GB	Single Controller	C-Temp
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### PCIe Add-in Cards (AIC) with 128GB DDR5\* RDIMMs

<b>CXA-8F2W</b>	8-DIMM	256GB / 512GB / 1TB	Dual Controllers	C-Temp
	8-DIMM	Unpopulated	Dual Controllers	C-Temp
<b>CXA-4F1Q</b>	4-DIMM	128GB / 256GB / 512GB	Single Controller	C-Temp
	4-DIMM	Unpopulated	Single Controller	C-Temp

\*Persistent (non-volatile) options available in both AIC and E3.S formats



For more information, please visit: [www.smartm.com](http://www.smartm.com)

\*Product images are for promotional purposes only. Labels may not be representative of the actual product.

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