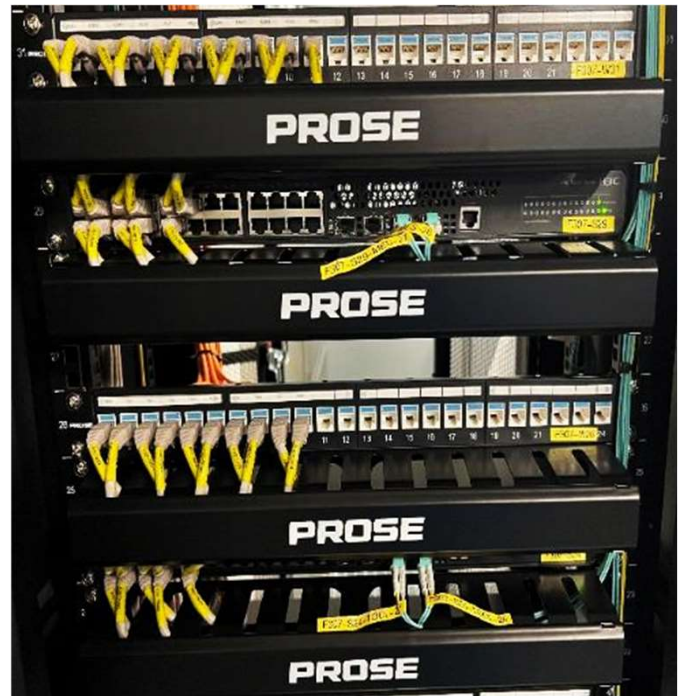


Advanced Semiconductor Facility: Improving Reliability and Efficiency with Micro Data Center and Structured Cabling

■ Background

In the highly competitive and technologically advanced semiconductor industry, reliable and efficient IT infrastructure is critical to ensuring uninterrupted production. A leading semiconductor manufacturer in China sought to modernize its IT environment to support real-time data processing, high-speed communication, and stringent security requirements across its fabs. To achieve this, the company implemented a Micro Data Center (MDC) and Structured Cabling System, aiming to enhance operational stability, scalability, and overall efficiency.



■ Challenges

The company faced several key challenges with its existing infrastructure:

- **Reliability Risks:** Frequent downtime threatened production continuity and scheduling.
- **Security Concerns:** Sensitive intellectual property and production data required stronger protection against cyber and physical threats.
- **Scalability Limitations:** Rapid expansion demanded a flexible infrastructure capable of adapting to increasing workloads.
- **Energy Efficiency:** High power consumption and inefficient cooling systems drove up operational costs.
- **Cabling Inefficiencies:** Legacy cabling caused signal degradation and increased maintenance complexity.

■ Solutions

To address these challenges, the company deployed PROSE's integrated MDC and Structured Cabling System. The solution featured rapid deployment (installation in less than one hour), energy-efficient power distribution and cooling systems achieving $PUE \leq 1.26$, and advanced security measures including biometric access control and intrusion detection. In addition, a 24/7 cloud-based DCIM platform enabled remote monitoring and proactive maintenance. The structured cabling system optimized signal integrity while simplifying network architecture and management.

■ Benefits / Results

The implementation delivered significant operational improvements:

- **Enhanced Reliability:** Substantially reduced downtime, ensuring continuous fab operations.
- **Improved Security:** Robust protection for sensitive data and critical infrastructure.
- **Scalable Infrastructure:** Flexible MDC design supports rapid business growth.
- **Energy Savings:** Optimized power and cooling reduced overall energy consumption.
- **Optimized Cabling:** Improved signal performance and reduced maintenance complexity.
- **Cost Efficiency:** Lower space, energy, and maintenance costs through compact and integrated design.

The deployment of PROSE's MDC and Structured Cabling System has successfully transformed the company's IT infrastructure into a secure, reliable, and scalable platform. Beyond addressing immediate operational challenges, the solution provides a strong foundation for future expansion and innovation—supporting the company's continued leadership in semiconductor manufacturing.

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