

SYSTEM INTEGRATION

Streamline build cycles and accelerate time-to-market with scalable and controlled manufacturing, assembly and test services

As your solution is prepared for full-scale production, we manage the workflow processes and tasks needed to ensure that systems are completed on time and error free. By recording the system's exact design and manufacturing requirements into our product lifecycle management system, we lock down the critical elements of your solution. This includes the hardware configuration, firmware, image and BIOS—all to ensure repeatability and consistency.

Our commitment to quality continues with our integration and manufacturing processes. The labs are organized into cells, which focus on specific technologies and integrator expertise like appliances, AdvancedTCA, frame builds, -48VOLT DC and 380VOLT DC. In addition, UNICOM Engineering uses manufacturing control software and hardware to ensure that each step of the manufacturing process aligns with exact build requirements. These tools provide control and quality checkpoints to make certain the right components and firmware are installed and test plans are completed and electronically verified before proceeding to the next step. All designed to deliver high quality, reliable solutions that you can trust. The best part is... we are flexible and responsive enough to handle change without interrupting supply or our ability to deliver.



Global Manufacturing

UNICOM Engineering maintains worldwide manufacturing sites and can scale production capabilities to meet any low-medium- or high-volume requirements. Our production engineers and assembly technicians are highly trained to build a wide variety of systems—from a small security or healthcare server appliance to highly complex ATCA platforms, frames and everything in between. All locations maintain the exact same processes and procedures so that customers can utilize a mix of manufacturing locations to meet their production and cost goals while reducing overall risk. Our focused approach is designed to serve OEM customers with manufacturing expertise as well as comprehensive application deployment services.



Control Systems

UNICOM Engineering employs control systems to ensure automated manufacturing processes. These systems operate across all manufacturing stations, at each manufacturing facility, to ensure predictable and repeatable builds for low-mix, high-volume products as well as high-mix, low-volume products. With these powerful tools, we are better able to globally maintain operational flexibility, build high-quality products and meet all facets of our customers' requirements, including production scalability, reliability and cost containment.

During the product development phase, all design and manufacturing requirements are recorded in a product lifecycle database, which governs revision controls and the process for subsequent change alerts. We use a versatile ERP system to synch our inventory and materials procurement to sales orders and forecasts, which helps us respond to changing requirements.

Control and quality checkpoints throughout the manufacturing process guarantee the right parts are installed and electronically verified. Our quality processes help streamline manufacturing cycles and accelerate time-to-market.

UNICOM Engineering's integration control systems, tools and processes provide a tremendous service advantage. Customers receive a complete and detailed system build plan, including a list of installed components and corresponding code levels. Should troubleshooting be required, service technicians can refer to this document for configuration details (including revision levels of microprocessors, memory chips, analog and digital circuitry as well as lot numbers for many critical components) and specify the proper repair or replacement parts.

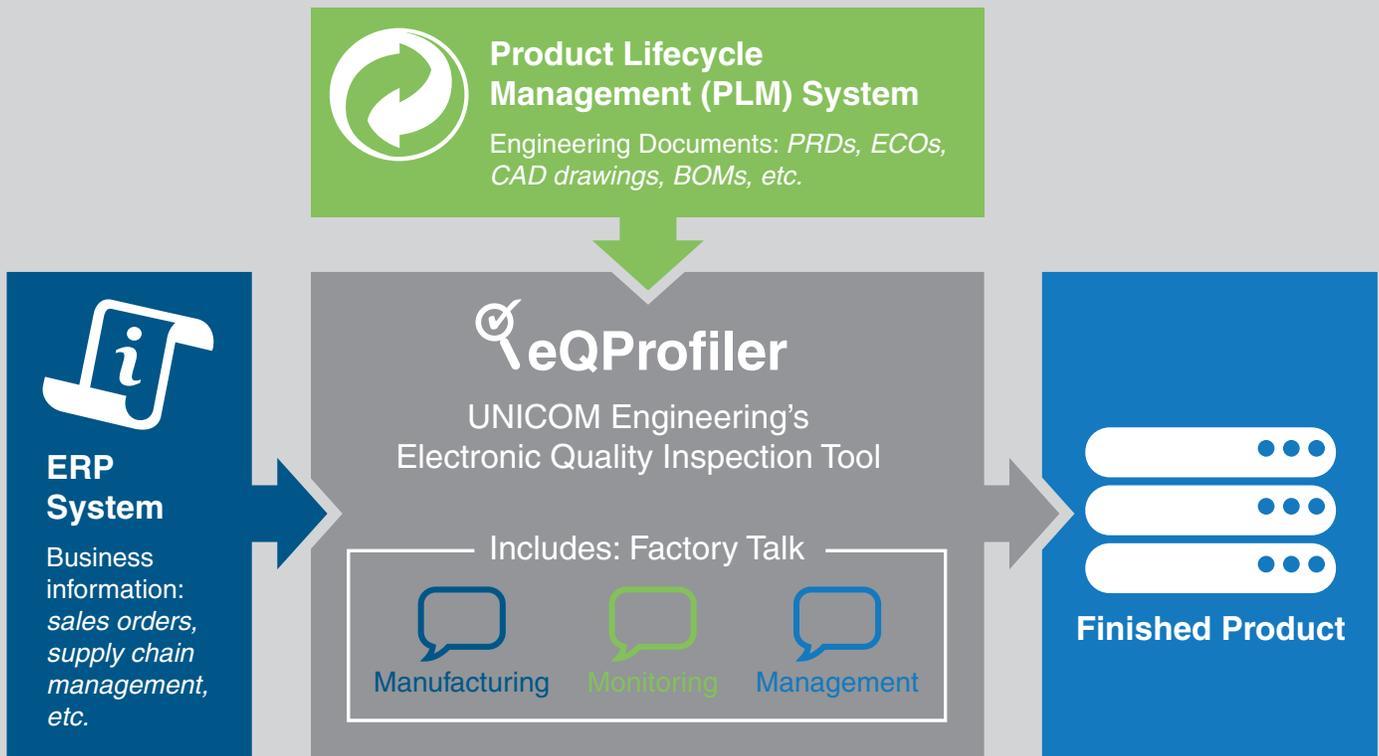


FIGURE 1: UNICOM Engineering's Integration Control Systems
The diagrams shows the systems used to ensure a fully integrated, repeatable build.

Systematic Controls

Our quality and control processes help streamline manufacturing cycles and lengthen the product's lifespan. These controls are uniformly used across all manufacturing sites and stations to ensure predictable and repeatable builds. Hence, UNICOM Engineering is better able to maintain operational flexibility, build higher quality products and meet all facets of our customers' requirements, including reliability and cost containment.

Accuracy Guaranteed

UNICOM Engineering employs eQProfiler and FactoryTalk software to ensure that each step of the manufacturing process aligns with exact build requirements (see figure 2). These tools provide control and quality checkpoints for specific SKUs throughout the manufacturing process to guarantee the right parts are installed and electronically verified before proceeding to downstream installation or test stations. All assembly stages are tracked and controlled in real-time to eliminate error and deliver the highest quality products available to our customers.



FIGURE 2: UNICOM Engineering's Manufacturing Process
Our manufacturing process is designed to accelerate product development, eliminate errors and document lifecycle control processes.

★ Quality at Every Stage

UNICOM Engineering's commitment to quality workmanship is governed by strict compliance to ISO 9001:2008 and TL 9000 Rev. 5.0. Our entire staff is trained and certified under these standards to ensure consistent, high-quality production and on-time delivery of goods and services. We adhere to these processes to assure customers of the highest quality workmanship and that their systems comply with global regulations. We also contract with third-party auditors to guarantee a proactive and highly organized approach to maintaining best-in-class business processes. TL 9000 compliance is maintained specifically for our customers who require telecommunications quality standards.

Benefits

- Ensures high-quality manufacturing and test processes
- Enables traceability to critical system components
- Controls high-mix, configure-to-order system builds
- Generates highly structured, predictable and repeatable BOMs
- Produces fully integrated, best-in-class systems and frames



Quality Reporting

UNICOM Engineering’s quality assurance engineers regularly analyze in-house data and field performance trends (see figure 3) to understand root cause and drive continuous improvement. Customers can view and download SKU-specific quality reports monthly from UNICOM Engineering’s customer portal (<http://www.unicomengineeringportal.com/>). These reports include data summaries, Pareto charts and detailed tables, in which failures can be identified and grouped by product or workstation.

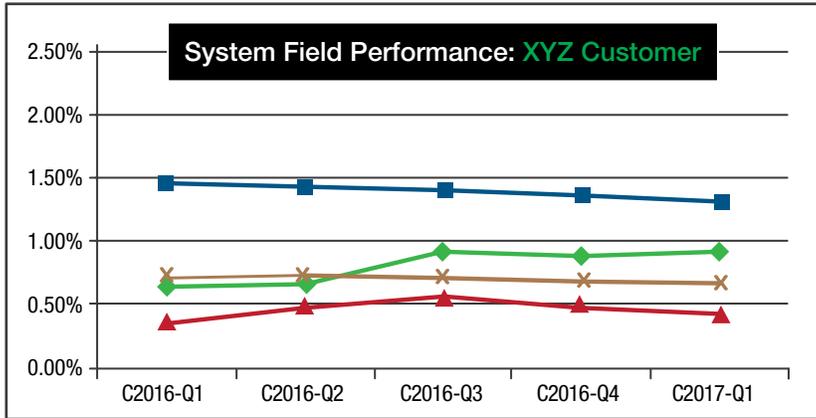


FIGURE 3:
UNICOM Engineering’s System Field Performance Report Example
This is an example of a customer specific field performance report used to drive root cause analysis and continuous improvement.



Quarter 1	C2016-Q1	C2016-Q2	C2016-Q3	C2016-Q4	C2017-Q1
Why Units in Field	19,840	19,449	19,493	22, 293	22,383
RMA Issued	123	127	174	193	201
Return Rate	0.63%	0.65%	0.89%	0.87%	0.90%
Predicted Return Rate	1.43%	1.41%	1.38%	1.35%	1.30%
Hardware Failures	69	91	107	110	94
Hardware Failures Rate	0.35%	0.47%	0.55%	0.49%	0.42%
Predicted Failure Rate	0.72%	0.71%	0.69%	0.67%	0.65%

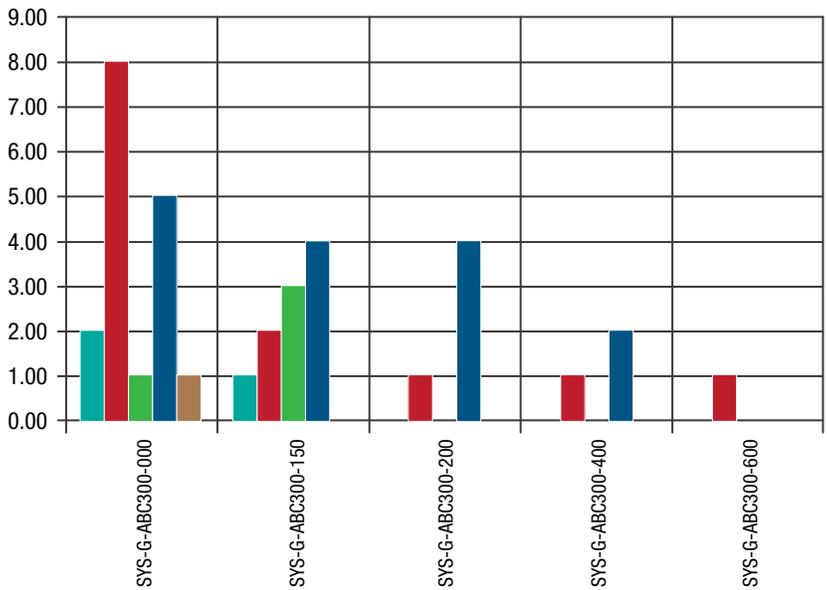
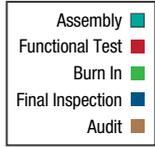


FIGURE 4:
UNICOM Engineering’s Top 10 Systems Pareto Report Example
This is an example of a WIP analysis report depicting the top pareto of failures over a given period and what areas in test they failed at. We then define action plans to determine root and at what point in the test they failed.



Rack Integration

UNICOM Engineering provides world-class rack and frame-level design and integration services for solutions entering an enterprise or carrier environment that demands a higher level of integration services. Our technology integration centers located in Massachusetts and Texas in the United States and Galway, Ireland deliver complete design, verification, staging,



FIGURE 5: Engineers testing individual systems prior to rack integration to ensure each system complies with requirements.

assembly, test and shipping capabilities. All of which are scalable to support a variety of volume deployments and high-mix architectures. We assist customers with the initial designs, create efficient build and verification plans, manage and prototype all modifications and ensure compliance with required standards. Since the nature of these engagements are varied, service fees are based on a statement of work outlining specific requirements with a custom quote.

From the initial design engagement, UNICOM Engineering documents requirements that later become detailed work and test instructions developed to guarantee repeatable and consistent builds. As we progress to the mechanical build phase, our team assembles the rack and integrates the power distribution panels, servers, storage, switches and other key components. We then route and identify cables for each system, based on customer requirements, and test the entire integrated rack for performance and functionality. The fully-integrated rack is then shipped in custom packaging for arrival at any site, ready for local installation and operation.



FIGURE 6: A manufacturing engineer installing an appliance into a rack.



FIGURE 7: Engineers integrating various components into a set of customer racks.

Carrier environments like Telco central offices have unique requirements that go beyond enterprise rack-level design and Integration. For solutions deployed in these environments, our frame-level design starts with a NEBS compliant frame. We optimize the frame space for thermal profiles, cooling and configuration to allow for proper ventilation between systems and alleviate space constraints. Thermal testing can be performed in our heat-controlled room with temperatures up to 105° F (40° C) for enhanced production stress testing.

Additionally, UNICOM Engineering has the ability to perform elevated temperature testing on individual or multiple systems and fully-integrated frame enclosures for design validation and production. Systems can be tested in a thermal chamber at temperature profile ranges from -67° to 131° F (-55° to +55° C). These stringent tests ensure systems are able to meet the strictest requirements of carrier and service provider deployments.

Why do leading technology companies trust UNICOM Engineering to deploy their solutions?

We have found that the following attributes are the things that create a sense of confidence in the minds of our customers as they partner with us to become an extension of their business.

- Comprehensive technology partner network including OEM affiliations with Dell, Intel, HPE, Supermicro and Lenovo
- Flexible engagement model with a proven ability to accelerate design, test, production and delivery
- Substantial engineering staff with deep technical expertise in purpose-built appliances, server platforms, and enterprise storage
- Multiple, global manufacturing sites designed to produce identical results regardless of location(s) utilized
- Quality and control systems throughout production process to ensure predictable, repeatable builds
- Full Lifecycle Management from initial development and product enhancements through end of life transition management
- Commitment to quality leadership backed by ISO 9001, TL 9000, and ISO 14001 certifications
- Business analytics tools to provide real-time visibility, optimize performance and decrease risk
- Extended warranties and worry-free repair, refurbishment and replacement services
- Always on, direct technical support services (phone, web, onsite)



ABOUT UNICOM ENGINEERING

UNICOM Engineering is a leading provider of server-based application platforms and lifecycle support services for software developers and OEMs worldwide. Through its expertise and comprehensive suite of solution design, system integration, global logistics, trade compliance, support and business analytics services, UNICOM Engineering is redefining application deployment solutions to provide customers with a sustainable competitive advantage. More than a decade of appliance innovation and strong technology partnerships make UNICOM Engineering one of the most trusted deployment partners in the industry. Founded in 1997, UNICOM Engineering has facilities in Canton, Massachusetts; Plano, Texas; and Galway, Ireland. For more information, visit www.unicomengineering.com.

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