PREDICTABLE PERFORMANCE IN UNPREDICTABLE ENVIRONMENTS.

Rugged. Reliable. Scalable. Secure.

CRYSTAL™

WHO WE SERVE

Your trusted partner for rugged, secure computer hardware

Autonomous vehicles. Critical power infrastructure. Military missions in austere and contested environments. Vastly different scenarios that all depend on real-time, seamless, secure data processing, storage, and transmission from high-performing computer systems. These unpredictable, unmanned and unforgiving environments require proven solutions that protect both equipment and data while delivering unwavering performance. That's why defense and industry leaders choose Crystal Group.

Our reputation for designing and manufacturing the most trusted rugged, reliable and secure computer systems is built on delivering solutions that perform without fail in harsh conditions when safety, accuracy and efficiency are paramount.

Our commitment is to solve your most difficult challenges with solutions tailored to your specific needs. With the agility to collaborate swiftly, we incorporate emerging technologies, cybersecurity, environmental performance, and unique requirements so you always have the latest, most reliable systems to achieve today's objectives for tomorrow's success.

About Crystal Group, Inc.

Crystal Group, Inc. is a technology leader in rugged computer hardware, specializing in the design and manufacture of custom and commercial rugged servers, embedded computing, networking devices, displays, and data storage for high reliability in harsh environments. A small employee-owned business founded in 1987, Crystal Group provides defense, government and industrial markets with integrated solutions that bring seamless, real-time artificial intelligence, autonomy and cybersecurity to demanding edge applications.

Crystal Group products meet or exceed IEEE, IEC, and military standards, including MIL-STD-810, 167-1, 461, and MIL-S-901, and are backed by a five-plus-year warranty. All products are manufactured in the company's facility that is certified to ISO 9001:2015/AS9100D quality management standards.

MILITARY & DEFENSE

With decades of experience designing field-tested and combat-proven military-grade computer products and integrated solutions, the U.S. Department of Defense and global allied nations deploy Crystal Group rugged servers, displays, and embedded systems with confidence to keep warfighters and front-line armed forces safe, informed and equipped for mission success.

Navy

With more than 17,500 Crystal Group rugged servers, the U.S. Navy relies on our equipment to perform secure, high-power computing operations in shipboard and other operations. Current deployments include:

- Aviation Data Management and Control System (ADMACS)
- Consolidated Afloat Networks and Enterprise Services (CANES)
- Common Submarine Radio Room (CSRR)
- P-8

Army

Our rugged servers, embedded computers and integrated transit cases are trusted on the ground and in the air by the U.S. Army around the world including:

- Counter Rocket, Artillery, and Mortar (C-RAM)
- The Integrated Air and Missile Defense Battle Command System (IBCS)
- Terminal High Altitude Area Defense (THAAD)

Air Force

The U.S. Air Force depends on our solutions to store and transfer data in harsh environments with unique specifications. Current deployments include:

- Airborne Cueing and Exploitation System – Hyperspectral (ACES-Hy)
- Advanced Extremely High Frequency (AEHF) Ground Relay Stations
- Northrop Grumman B-2 Spirit, Stealth Bomber

WHO WE SERVE

INDUSTRIAL

Autonomous vehicles & systems

Innovators worldwide are racing to introduce safe and reliable autonomous and unmanned vehicles and systems into mainstream transportation. By incorporating our rugged and secure high-performance computer architectures and electronics systems, our customers are achieving their development goals on schedule, on budget, and ahead of the competition.

- Advanced driver assistance
- Artificial intelligence & machine learning
- Delivery and rideshare service
- Transportation infrastructure
- Traffic monitoring
- Unmanned aerial and underwater vehicles

Commercial aviation

Accurate, uninterrupted operation of multiple onboard systems is critical to flight safety. Crystal Group's unique combination of lightweight, carbon fiber computer hardware equipped with DC power meets strict EMC/EMI requirements, ensuring critical processing power for safe, reliable flight operations.

- Custom instrumentation packages
- Onboard diagnostics
- Search and rescue efforts
- Data and video capture
- Terrain mapping

Railway transit

Rail networks require sophisticated automation to deliver scalable configurations, multiple functionality, and high performance. Using Crystal Group rugged embedded computers, railways are benefiting from consistent rail safety, location monitoring, communication, lighting, fault detection, and collision avoidance.

- Collision avoidance
- Control monitoring
- Data acquisition
- Signal control
- Traffic management

Oil & Gas

Improvements in computing technology have advanced seismic data processing and analysis, along with reservoir modeling and simulations. With the increased focus on production monitoring, our rugged platforms meet the challenges to increase overall high-performance computing throughput and productivity while reducing system footprint, power, and cooling overhead.

- Well production
- Fracking operations
- Down hole fiber analysis
- Pipeline health monitoring
- Gas leak detection

Power

Creating, distributing and monitoring electricity across a broad scope of energy forms — including nuclear, thermal, hydro and renewable power — requires infallible computing performance. That's why major power companies depend on our rugged solutions to monitor and maintain uninterrupted automation systems at substations, often in remote locations with limited or intermittent onsite staff.

- Substation control
- Plant monitoring
- Outage identification
- Field monitoring
- SCADA monitoring

Mining

Vibration, dust, extreme heat and cold, air pressure and humidity present unstable conditions in tough mining environments. This makes mining operations increasingly dependent on sophisticated computing technology to improve safety, increase productivity and reduce operating costs. Our innovative mining automation solutions withstand these challenges with high reliability and low maintenance.

- Shovel control
- Wireline monitoring
- Surface mining operations
- Topology mapping
- Remote autonomous drilling
- Remote excavation

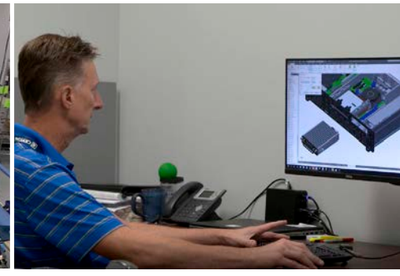





HOW WE WORK





RUGGED THAT WORKS

You can't compromise on quality or performance when operating in edge environments. Our engineers have perfected critical system design elements to optimize operational life, performance and reliability to give you an edge when you need it most.

Rugged chassis

Milled, not bent, 6061T651 aircraft-grade aluminum exterior and interior support structures are bonded and fastened to base plates. This enhances vibration performance, limits weight, and improves thermal and electrical conductivity. Non-hexavalent chromate coatings maintain electrical conductivity for low impedance interfaces while providing superior corrosion resistance.

Advanced thermal management

We specialize in solving the toughest thermal-management challenges to optimize performance and operational life by protecting critical components and systems from run-away temperature extremes.

Shock isolation and vibration resilience

Systems are meticulously designed and developed to withstand extreme levels of shock and vibration with purpose-built solutions that meet or exceed military and industrial specifications.

Rigorous performance standards

We design and test our systems to meet or exceed IEEE 1613, IEC 61850 and military standards, cybersecurity protections, and program requirements. As standards are updated, so are our designs.

Quality

Specializing in custom, low run-rate products requires a heightened attention to quality. Certified to AS9100D, we develop and build products using proven, controlled and documented processes and procedures. We generate work instructions for products to ensure builds are identical and controlled, year after year.

TECHNICAL SUPPORT

When safety, security and accuracy are paramount, you can't afford delays and downtime if problems arise. Our Technical Services team is ready to answer your call 24/7 to ensure you receive real-time support, including:

- Onsite engineering and troubleshooting assistance
- Direct communication with our Engineering team and technicians
- Same-day dispatch to any point in the world to resolve technical issues
- Seamless support of operating systems, application software, and third-party hardware
- Five-day average RMA completion

They also provide complete in-field installation services, including pre-installation site planning. Our trained technicians and engineers are available to install complete systems or provide onsite assistance to your team, **no matter where you are**.

Our warranty has you covered

Every product we deliver comes standard with a full, five-year warranty. If you want to extend your warranty even further, you can purchase up to 10 additional years of coverage that starts the first day after the original warranty expires.

In the event of a product failure, we may choose to provide advance replacement for parts or complete units to help you avoid any costly delays or downtime. These decisions are made at the discretion of the Technical Services department in concert with you, the customer.

CONFIGURATION MANAGEMENT

Change is inevitable. We can't always predict it but staying engaged and aware keep us positioned to adapt — not react — when it does occur. Proactive configuration management is vital to staying ahead of and planning for known changes to your program's commercial off-the-shelf (COTS) components.

Our systematic approach tracks and factors in hardware and software changes to replace end-of-life and last-time-buy components over the operational life of a product or system. These forward-looking measures ensure changes to the original configuration are seamless while maintaining consistent product integrity, performance and compliance.

RUGGED SERVERS

Our rugged servers and workstations deliver high-performance computing, data storage, and cyber protection for seamless, real-time communications and networking, weapons control, situational awareness, surveillance, and autonomous vehicles in the most challenging and unpredictable edge environments. Constructed with rugged, all-aluminum chassis and state-of-the-art thermal management these powerful, yet compact, servers can withstand harsh conditions and rough terrains for both military and industrial applications.

- Airborne intelligence, surveillance, reconnaissance
- Shipboard and undersea communications
- Ballistic missile defense
- Command and control systems
- Signals exploitation systems

RUGGED EMBEDDED

CRYSTAL™

Feature-rich embedded computer systems are powerful, compact and rugged. Easily configurable to meet program-specific workstation requirements, our embedded products boast advanced thermal management, carbon-fiber chassis options, and are field tested to withstand shock and vibration, extended temperature ranges, harsh elements, and extreme environments. Our embedded computer systems follow the Intel® embedded roadmap to ensure access to the latest in long life, powerful Intel chipsets and processors.

- Electrical substation cybersecurity
- Oil & gas exploration and extraction
- Ground mobile communications
- Command and control systems

RUGGED NETWORKING

Equipped with secure, ultra-low latency, our rugged networking appliances ensure reliable, real-time data transmission to demanding applications in any domain or operating environment. All of our high-performance switches and firewalls are housed in rugged, lightweight, compact enclosures, such as transit cases or 19-inch racks with strain-hardened aircraft aluminum built to survive extreme temperatures, humidity, shock and vibration, dust, sand, and salt fog.

- Shipboard and undersea communications
- Ground-based radar
- Mobile/forward command posts
- Ground attack systems

RUGGED STORAGE

Available in multiple form factors, we design turnkey rugged storage systems that combine high-capacity data storage with leading-edge data protection features that meet or exceed strict certification levels and standards. With a range of capabilities, including Seagate® FIPS 140-2 and NIAP-accredited 2.5" SAS SSDs, intrusion detection, and instant data destruction, your critical, confidential data is secure from attempted breaches in extreme air, land, sea and space conditions — when it matters most.

- Airborne maritime surveillance and warfare
- Electronic warfare systems
- Mobile command posts

WHO WE ARE






100% employee owned and operated, everyone at Crystal Group is invested in delivering meaningful innovation, reliable products, and exceptional customer service. We are all motivated and empowered to meet commitments, implement improvements, and exceed expectations to ensure your success.

We are problem solvers.

Fueled by creativity, technical expertise, and tenacity, we push the boundaries to achieve what is needed. Our mission is to solve your most difficult compute challenges with solutions tailored to your specific needs and the flexibility to evolve for long-term and performance.

We are your ally.

Ensuring safety, security and success in dynamic, unforgiving edge environments is only possible through strong, collaborative partnerships. The more we work together, challenge each other, and navigate ever-changing dynamics, the more efficiently we develop the advanced solutions you need to achieve your objectives and deliver results.

We are equipped to deliver.

In 2018, our new headquarters expanded our campus by 111,500 square feet, increasing production capacity by more than 50 percent. Designed for efficient product flow, automation, and real-time collaboration between Engineering and Manufacturing, our on-site production facility includes a DEC surface mount line with automated optical inspection, robotic staking, and conformal coating application, environmental test lab, and classified secure rooms.

We are committed to your success.

We're only successful when the solutions we develop and deliver enable you to achieve your objectives with precision and reliability. Our agility and progressive technical innovations ensure that we consistently incorporate new technologies, performance standards, and program requirements. We also maintain your configurations to keep you current with the latest, most reliable technology and operational longevity.

PARTNERSHIPS

What we do is important, but just as important is how we do it. Strong relationships are the foundation that fuels our ability to consistently innovate and deliver high-performance compute solutions that keep people safe, data secure and systems connected at the edge.

CommScope® Ruckus™

As CommScope's sole supplier of rugged ICX switches for military and industrial applications, our hardened and MIL-SPEC solutions deliver the most powerful networking capabilities to the warfighter and other tactical users.

Intel® Platinum Technology Provider

With Intel's Xeon scalable processors as the foundation for many of our compute solutions, we're the go-to partner in Intel's global network for solving their users' most challenging ruggedization needs.

Seagate®

We are the sole provider of the leading-edge data-at-rest solution that meets strict U.S. government computer security standards, including FIPS 140-2 and NIAP accreditation.

NVIDIA® Preferred Partner

As a preferred original equipment manufacturer (OEM) in the NVIDIA® Partner Network (NPN), we develop and build high-performance compute solutions for demanding AI applications at the edge using NVIDIA's GPU-accelerated technology.

RackTop®

Partnering with RackTop, we developed a cyber-converged network platform to encrypt large data streams with near-zero latency, while simplifying policy management, data access, data at rest security, key rotation, and key management.

Advantech

With Advantech's extensive experience in creating and producing industrial computing electronics, we are developing the next level of ruggedization capability for server and workstation applications.

SUCCESS FOR ONE MEANS SUCCESS FOR ALL

As a business unit of Employee Owned Brands, Inc., Crystal Group is 100% employee owned and operated. Our unique ownership fosters a culture that empowers every employee owner to achieve and improve on the highest standards for quality, efficiency, safety, innovation and personal service.

Our employee owners are committed to working together to serve our customers and to make us the best at everything we do.

Employee Owned Brands, Inc. is a member of the following employee ownership associations:

- Employee-Owned S Corporations of America (ESCA)
- National Center for Employee Ownership (NCEO)
- The ESOP Association

Other business units in the Employee Owned Brands, Inc. family are:

- Apache Stainless
- Dexter Services
- Dexter Laundry
- Leer

CRYSTAL™

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