ELMA
Your Solution Partner

Products and Services for Defense Applications

SYSTEM SOLUTIONS

ENCLOSURES & COMPONENTS

ROTARY SWITCHES

Who We **Are**

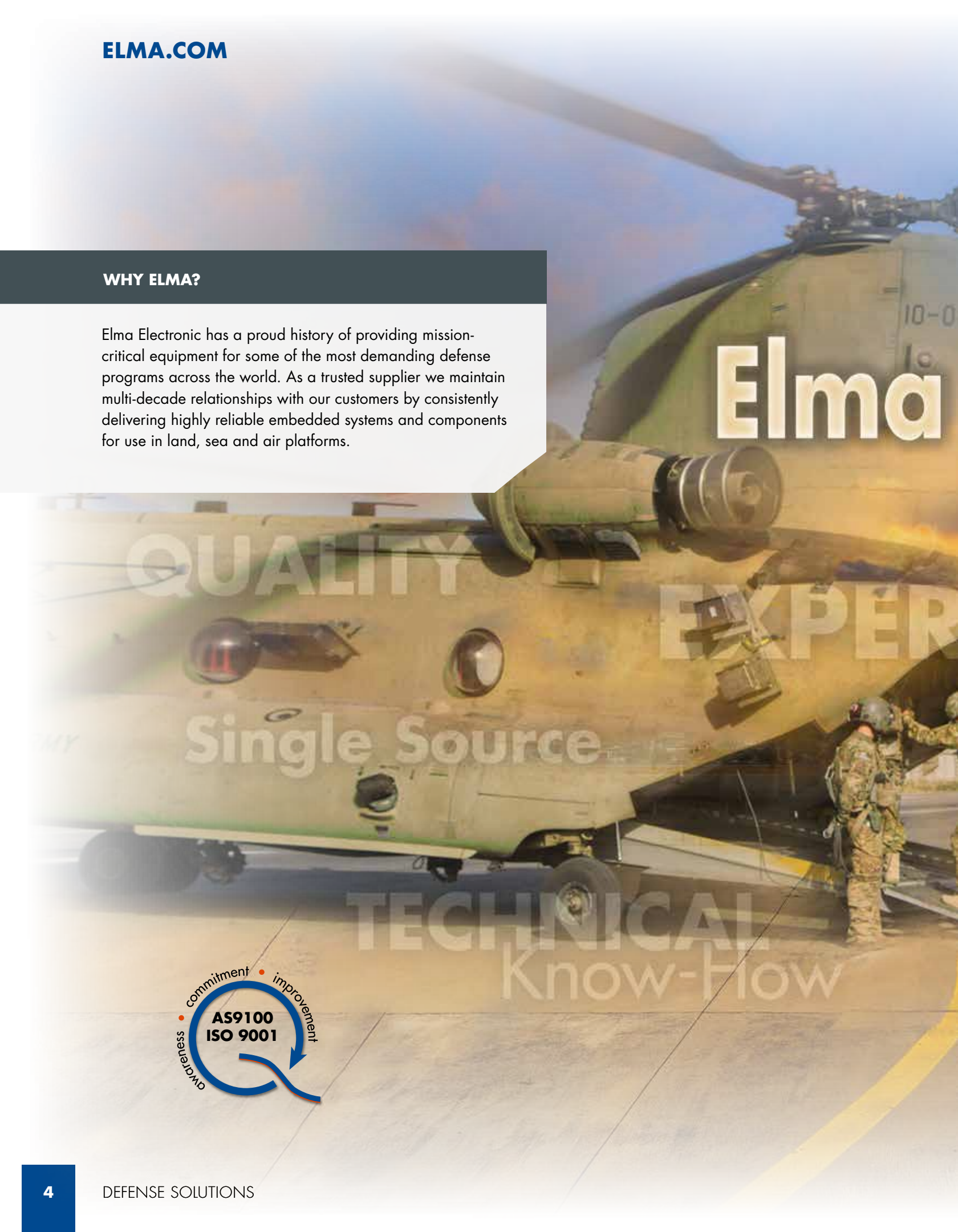
Elma Electronic is a global leader in embedded computing solutions including integrated chassis systems, board products, modular enclosures, equipment cabinets and precision hardware components in standard and custom configurations. As a global organization, we keep close to our customers and partners worldwide with sales, design and manufacturing facilities across three continents.

Reliability and long-term support with a history of deep technical expertise and precision engineering. That's Elma.

DEFENSE SOLUTIONS TABLE OF CONTENTS

WHY ELMA?

Elma Electronic has a proud history of providing mission-critical equipment for some of the most demanding defense programs across the world. As a trusted supplier we maintain multi-decade relationships with our customers by consistently delivering highly reliable embedded systems and components for use in land, sea and air platforms.




Advantage
Capabilities
Reliability
Resources

Proven **Building Blocks**

Elma provides a wide range of modular, open standards-based products and technologies using a combination of our own proven chassis, backplanes, boards, rotary switch solutions and power supplies; plus best in class products from our extensive partner ecosystem. The result - custom and off-the-shelf solutions that work for you.

Innovative **Solutions**

With **YOU** at **EVERY** Stage

A TRACK RECORD OF DELIVERING PRODUCTS MEETING A RANGE OF MILITARY STANDARDS

- MIL-STD-810G: Environmental
- MIL-STD-167: Shipboard vibration
- MIL-STD-461E: EMI shielding
- MIL-STD-704E: Aircraft power
- MIL-STD-1275A: Vehicular power
- MIL-STD-5400: General aerospace
- MIL-STD-901D: Shock
- Reliability analysis per MIL-HDBK-217F

SERVICES AND CAPABILITIES

An Experienced Approach

COTS and custom designs form the backbone of our embedded systems. Our team of mechanical and electrical design engineers are experts in solutions pertaining to enclosure configuration, thermal management, I/O interconnect, EMC, shock/vibration, system monitoring, reliability and maintainability considerations.

Design and test activities are supported by an in-house Design Verification and Test (DVT) lab in our Fremont facility. The lab enables Elma engineers to thoroughly test and verify performance each step of the way, reducing time and expenses.

We use the latest in 3D modeling, thermal analysis, structural analysis and signal integrity software, and apply a modular building block approach to leverage proven designs for new system concepts. Combine this with a proactive product life-cycle management system for the long-term support and reliability you need.

Quality - Assured

Elma is an ISO 9001: 2015 and AS9100 certified supplier. All of our quality procedures are implemented and maintained in accordance with those standards. At Elma, we strive for excellence by practicing completeness, accuracy, timeliness, and by exceeding expectations in everything we do.

Design Verification and Test Lab.

Program **Management**

The importance of program management for complex engagements cannot be overstated. Elma provides program oversight from initial project definition through final delivery. Project-level activity tracking is managed by a designated individual who serves as a communication hub for status updates. Using the latest in project management tools, the program manager has oversight of the entire design process and coordinates activities among interested parties in regularly scheduled calls or on sight visits as needed. The goal of our experienced program management team is to ensure on-time delivery of systems that meet project specifications.


CH
IIRS

Defense **Programs**

Elma supports US and international defense agencies and programs with proven products and services, leveraging the most advanced technology and unparalleled integration know-how.

Our rugged solutions support critical C5ISR (Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance) needs including:

- Weapons control systems
- Radar systems
- Missile guidance systems
- Mission data recording
- Persistent surveillance
- Target tracking
- Engine control systems

A sampling of programs in which Elma participates:

- Globalhawk
- Predator
- Trident Submarines
- DDG Destroyers
- Aegis Combat Systems
- Trafalgar, Vanguard and Astute Class Submarines
- Terminal High Altitude Area Defense (THAAD)
- Gripen Fighter Jet
- Patriot Air and Missile Defense System
- RAFALE Fighter Aircraft
- Air and Missile Defense Radar (AMDR)
- Joint Light Tactical Vehicle (JLTV)
- Multi Role Tanker Transport (MRTT)
- P-8A Poseidon
- Joint Strike Fighter (JSF)

OPEN STANDARDS

Open Standards, Open Architectures

Open computing architectures and standards lie at the very core of Elma's products and services. These widely adopted, non-proprietary specifications help reduce development and integration cycle times and costs, offer interoperability, technology upgrades and reuse capability. In support of the DoD's Modular Open Systems Approach (MOSA) initiative, Elma's wide selection of products across multiple manufacturers are based on open standards architectures that encourage an ecosystem based solution. Our designs and partner solutions enable us to offer tailored and COTS designs without having to start from scratch, while reducing the time it takes from design to deployment.

VITA Trade Association

The VITA Standards Organization (VSO) governs several open architectures including the family of OpenVPX standards, VNX+, VME popular mezzanines like PMC, XMC and FMC board form factors.

OpenVPX, VNX+ and Related Specifications

As a key contributor to the OpenVPX family of technical standards committees as well as the updated small form factor standard VNX+, Elma continuously plays a leading role in the standard's evolution. Leading edge performance for today's high-speed rugged applications require the right suppler and the right platform to bring it all together. Elma's OpenVPX integration team leads the industry in experience and the critical design know-how necessary for successful system development.

VMEbus

Long the workhorse of embedded standards in defense applications, VME-based products and solutions designed by Elma have over a 30-year track record of unfailing service. Defense programs worldwide rely on leading edge and legacy VME boards and systems from Elma.

Mezzanines

VITA 42 XMC, IEEE 1386.1 PMC and VITA 57 FMC (FPGA) mezzanine cards allow easy and cost-effective system upgrades to keep pace with ever-changing system requirements while preserving your investment in the single board computer host card. Elma supplies storage and I/O mezzanines for PICMG and VITA slot cards.

Sensors Open Systems Architecture™ (SOSA)

Our long-standing leadership in technical standards, experience in critical global defense programs, and our extensive portfolio of products based on OpenVPX and SOSA™, enable Elma to partner with our customers in research, development and deployment of equipment and infrastructure installed in the most demanding defense applications.

OPEN STANDARDS

Elma is a member of leading trade associations and technical working groups focused on open standards: VITA, SOSA, PICMG, and PCI-SIG. We actively participate in technical standards committees so you can count on us to be up to date with the latest technology.

PICMG Standards

Elma also supports the PICMG trade association and its modular architecture standards. CompactPCI and AdvancedTCA have been the most widely used in defense applications, supporting a range of multi-vendor, interoperable products and system-level solutions. The more recent, high-speed CompactPCI Serial (CPCI S.0) and the small form factor COM Express architectures are increasingly gaining wider acceptance in the defense arena.

CompactPCI Serial

CompactPCI Serial is a high-speed serial architecture that is a great option for computing applications that don't require highly rugged design, yet offer modular ecosystem choices with long lifecycles. Elma offers a full line of chassis platforms and partner boards to support this standard.

COM Express

Our own line of custom rugged carrier cards supports the latest Type 6 and Type 7 partner CPU offerings. Along with our line of MIL-STD small form factor power supplies and extensive packaging options, Elma provides complete COM Express based solutions for defense equipment.

AdvancedTCA

Elma's portfolio of backplanes, chassis, integrated systems, handles and panels meet your ATCA-based application needs. Rugged shock-isolated systems serve a wide array of military communications installations.

Other Standards PCI/104

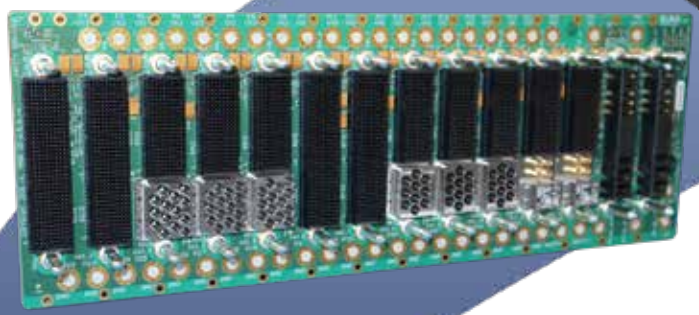
From MIL-STD 704 and 1275 rugged power supplies to complete integrated systems, Elma brings together our longstanding board design experience to offer highly reliable PCI/104 card-based solutions to a wide range of defense applications.

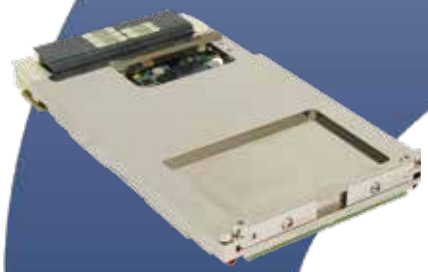
OpenVPX and SOSA – Leadership Matters

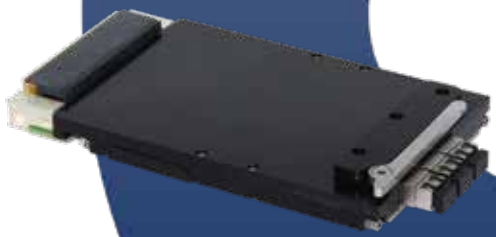
Our long-standing leadership and experience in critical worldwide defense programs, along with our full range of OpenVPX products aligned to SOSA, enable foundational roles for Elma in the research, development and deployment of equipment and infrastructure installed in the most demanding defense applications in use today.

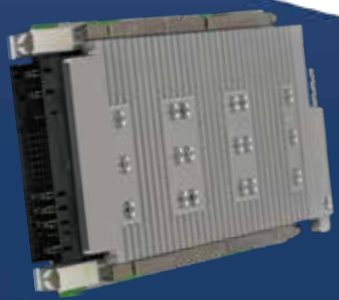
OpenVPX DEVELOPMENT SUPPORT

From development to deployment, systems aligned to OpenVPX and/or SOSA require a comprehensive approach with an eye on the end application. Elma is in the unique position to support our customers every step of the way. Our engineering team draws on years of experience along with our complete line of OpenVPX products including backplanes, best-in-class board products, power solutions, development and deployable chassis, plus a full line of system test and integration accessories.









Assisting you throughout the development process

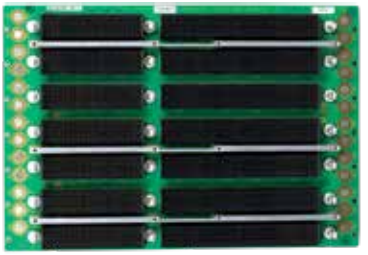
- Open access development chassis
- Test backplanes
- Accessories; RTMs, extender cards and slot cabling
- Single board computer options
- 10G and 40G Ethernet switching options, copper and fiber
- VITA 62 power supplies
- Complete integration support
- Deployment system design – ready for your final application

OPENVPX AND SOSA EXPERTISE

No one knows OpenVPX like Elma Electronic. We are pioneers of and key contributors to the development of the OpenVPX family of standards (VITA 46, 48, 49, 60, 62, 65, 66, 67, 68, 76 & 86), with leadership roles in several key technical committees. Recent activities have brought the tri-service branches together with industry to develop the Sensor Open Systems Architecture (SOSA) technical standard, following the Modular Open Systems Approach (MOSA). Elma is an early and leading industry participant in the development of these standards, which are based on the OpenVPX architecture.

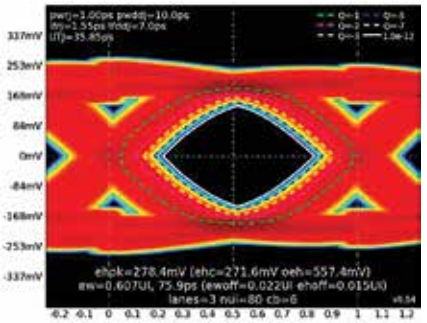
Backplanes

The backplane is at the heart of it all. Excellent signal integrity design is critical to reliable and successful OpenVPX systems, Building on decades of backplane manufacturing experience, Elma engineers are innovation leaders in high-speed signal processing design and developed the industry's first OpenVPX backplanes. We've designed and tested over 60 configurations spanning 3U and 6U board sizes, supporting OpenVPX-based systems development worldwide.



- VITA 66.4 optical, 67.1 RF and 67.3 RF/optical modules
- 1000BASE-BX and KX, 10GBASE-KX4 and KR, or 40GBASE-KR4
- Slot counts from 1 - 12
- Multi-star, distributed mesh, custom, plus power and ground designs
- Radial clock slot for IEEE 1588 precision timing protocol and network synchronization
- VME / VPX hybrid versions supporting legacy boards and the latest VPX boards

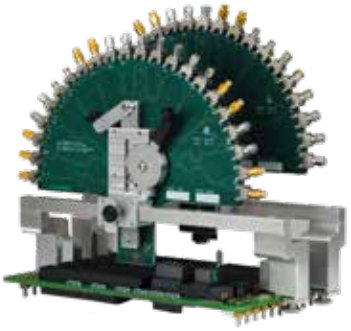
Backplane designs for the highest level of signal integrity



At speeds up to 100GBASE-KR4, every feature of backplane design can influence signal integrity (SI) – every trace, layer separation, turn bend, via, via transition, etc. Elma's signal integrity analysis and simulations consider every element in the channel to ensure optimal performance.

We focus on each feature individually to model the complete channel and optimize the return loss for each. Once modeled, they are concatenated together along with the trace and connector models to create the complete channel. Today's critical high-speed systems require nothing less than reliable, repeatable solutions - every time.

System Level Channel Characterization



When designing at the system integration level, Elma uses precision probe cards for complete channel characterization between all points on the backplane.

OPENVPX AND SOSA EXPERTISE

3U VPX backplane for optimal functionality in tight spaces

Designers of systems for SWaP-constrained installations rely on Elma's wide selection of 3U VPX backplane profiles and our custom design experience.

6U VPX backplane for maximum compute density

For less space constrained installations, our 6U VPX backplanes enable leading edge compute densities and more I/O options in systems that need added capability.

Sample OpenVPX backplane topologies for 3U and 6U boards

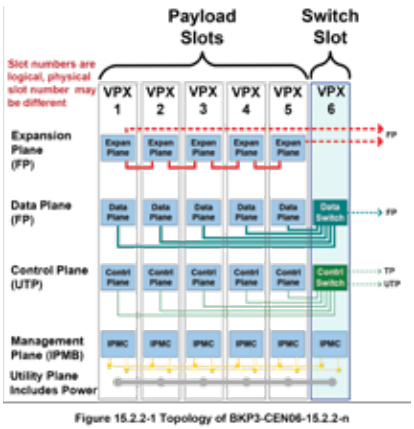
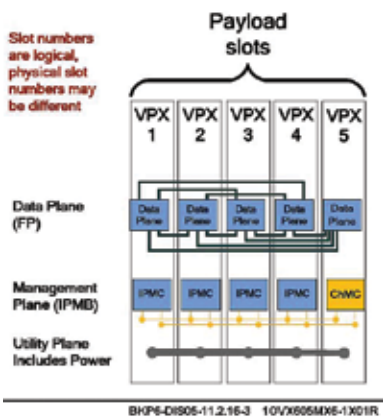
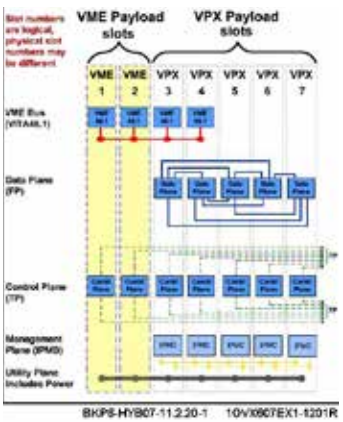


Figure 15.2.2-1 Topology of BKP3-CEN06-15.2.2-n

SINGLE / MULTI-STAR



DISTRIBUTED MESH



CUSTOM / HYBRIDS

VITA 66 and VITA 67 Optical and RF Support

RF and optical backplane connectivity preserves signal integrity with data rates far surpassing copper. Backplane connectors enable easier module removal vs. front panel connectors and eliminate front panel cabling.

OPENVPX AND SOSA EXPERTISE

Supporting the Department of Defense VPX CMOSS hardware and software convergence initiatives

As a key participant in the DoD hardware convergence initiatives, Elma supports multiple defense program efforts undertaken to facilitate the development of interoperable systems across several defense branches.

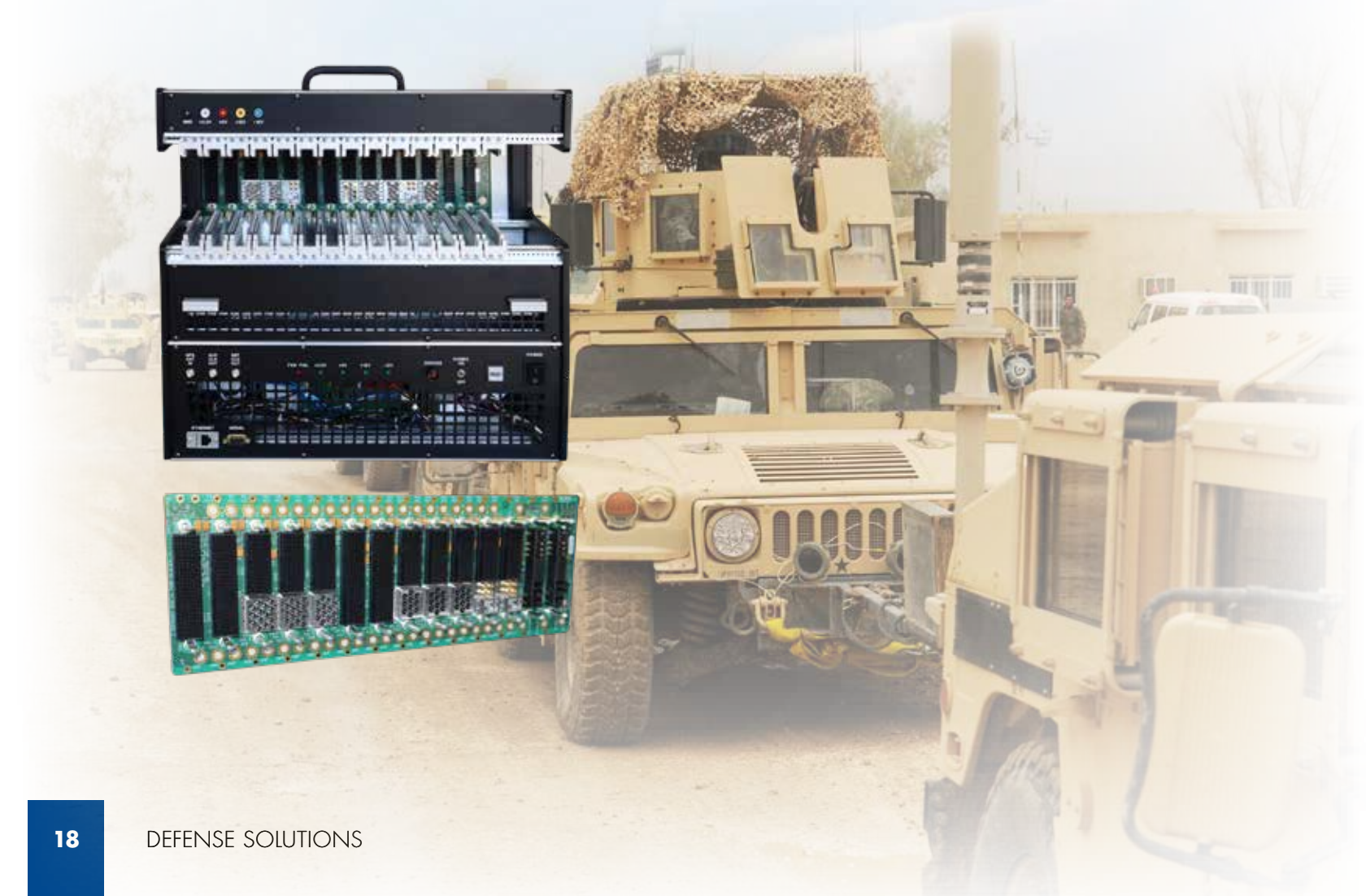
The collective goals of the US Army CCDevCom CMOSS (C4ISR Modular Open Suite of Standards), US Navy's NAVAIR (HOST), and Air Force's AFLCMC program efforts are to move towards more extensive use of COTS-based open standards, improve subsystem SWaP, enable rapid technology insertion and promote reuse. Emerging standards will provide reconfigurable, upgradeable and cost-effective C5ISR, SIGINT, EW and SDR capabilities in deployed platforms.

DoD hardware convergence support – backplanes and platforms

Our CMOSS Development Platform supports convergence initiatives by enabling the integration of C5ISR systems used in ground vehicles, unmanned systems, command centers and other mission critical environments.

At the heart of the platform is Elma's backplane for CMOSS and SOSA platform test and development efforts. The backplane includes the latest slot profiles, including apertures for high speed RF (VITA 67.3) and optical I/O connections.

The open access chassis allows convenient board testing and troubleshooting with air or conduction cooled slot options.



OPENVPX AND SOSA EXPERTISE

Shorten your time to deployment with our development chassis for OpenVPX and SOSA

Our lineup of easy access E-frame and CompacFrame platforms enable fast and efficient application development and help shorten your time to deployment. Chassis features include an open frame format for probing and quick board changeover, either a backplane with profiles aligned to SOSA / VPX or power and ground only, rear transition slots, chassis manager, power supplies, air- and conduction-cooled card guides, cooling and more.

Best-in-class board products

We have strong, long-standing relationships with strategic board partners to provide the latest CPUs and GPGPUs, network switches, and I/O available to meet the requirements of systems aligned with OpenVPX and SOSA standards.

Deployable chassis designs

Developing high-speed signal processing equipment for harsh SWaP constrained installations requires a holistic design approach in which Elma excels. Optimal chassis designs must consider the payload power envelope in conjunction with extremes in temperature, shock, vibration, ingress, EMC and other environmental factors. Elma supplies OpenVPX chassis for use across multiple defense programs. Our ATR, miniATR, and custom chassis designs are available with a range of cooling choices; conduction cooling, air cooling - including hybrid conduction and air-cooled models and liquid cooling. Choose from aluminum or composite chassis construction.

Type 12, 19" Rackmount Chassis

Sturdy aluminum panels and extrusions form the basis of a solid light duty rugged chassis. Rigid backplanes, industrial power supplies, and optional anti-vibration card guides reinforce the strength of this rackmount platform.

Architectures supported: OpenVPX (VITA 65), SOSA, VME, CompactPCI and CompactPCI Serial

19" CHASSIS - RUGGED

TYPE 12 CHASSIS FAMILY

Elma's Type 12 family of enclosures provide a versatile packaging solution for rackmount installations in harsh environments. Based on a modular packaging approach, the system can be configured by selecting the backplane, PSU and number of card slots. Engineered for superior cooling, the units are available with either front to rear or bottom to top airflow. Standard heights range from 3U to 12U with custom sizes possible. The Type 12 will accept 3U, and 6U Eurocard form factor cards mounted vertically or horizontally. Platforms can be configured with or without rear I/O card cage.

Features

- 19" rackmount, aluminum, gold alodined
- 3U, 4U, 7U, 9U, 10U, 12U heights
- OpenVPX, SOSA, VME, cPCI, and cPCI Serial applicablel
- IEEE 1101.10/.11 compliant
- 2 to 21 slot backplanes (architecture dependent)
- FCC and CE compliant advanced EMC shielding
- Wired platform with backplane, power supply, integrated cooling
- 80mm Rear I/O card mounting
- 150W - 2000W power options, AC or DC input

Benefits

- Field-proven design for reliable performance
- Rear card mounting option maximizes I/O
- Robust air cooling boosts system uptime

Enhanced Cooling Strategies

Type 12 chassis are available with enhanced cooling for high wattage board payloads. Custom baffling and air flow strategies plus high capacity fan modules ensure reliable operation in hot environments. System monitoring is available with front panel displays for system status at a glance. As with all Elma chassis, custom hybrid backplanes as shown are also available.

Horizontal Board Mount

With optional configurations supporting horizontal mounting for 6U board sets, the Type 12 chassis enables flexibility regarding space constraints in your equipment racks. As with all Elma 19" chassis, each horizontal mount version offers standard and custom cooling, power, backplane and shock mitigation systems for the target payload and environment.

Type 12R2 Family, 19" Rackmount, MIL-Rugged

Type 12R1 and 12R2, 19" rackmount enclosures are designed to meet the harshest Military and Industrial standards in deployed applications.

Architectures supported: OpenVPX (VITA 65), SOSA, VME, CompactPCI and CompactPCI Serial

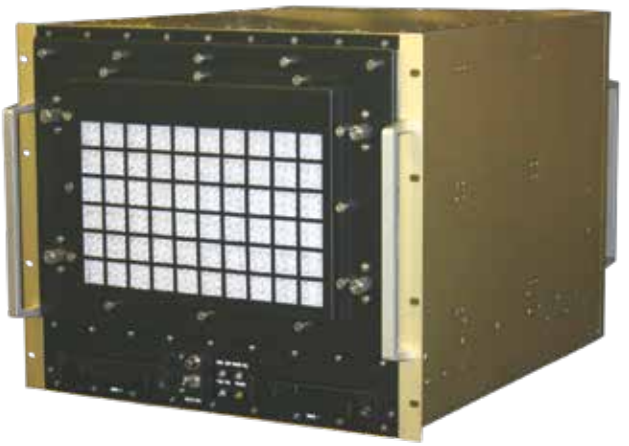
19" CHASSIS - MIL RUGGED

TYPE 12R1 & 12R2 CHASSIS FAMILIES

The COTS 12R1 and 12R2 family of enclosures are a high-quality and cost-efficient rugged package for all defense applications. The rugged product line includes up to 14U high models for 3U and 6U Eurocard form factors. Intended to withstand the demands of a military environment, the 12R1 (light-weight rugged) and 12R2 (fully rugged) are designed to meet benchmark military standards. The 12R2 uses honeycomb filters, braided gasketing, and metal impregnated gasket sheets to seal off every external seam to ensure compliance to MIL-STD-461.

Features

- Modular, rugged COTS design
- Standard sizes: 5U, 8U, 9U, 10U, 12U and 14U heights
- OpenVPX, SOSA, VME, cPCI, and cPCI Serial
- Military-grade components
- Tested for shock, vibration and structural integrity
- Proven performance for multiple military and defense applications
- Ideal for shipboard, ground mobile and some airborne applications
- All products feature multiple configurations and are customizable
- Withstands 25 Gs shock and vibration resistance
- Shelf management optional
- Custom configurations available



Benefits

- Multi-program track record of performance for guaranteed results
- Pre-tested for reduced time to deployment
- Backed by Elma's industry best design team

Low-Profile Horizontal Board Mount

Low profile 5U Type 12R2 chassis are ideal for space-constrained locations. Horizontal 6U board mounting for up to 8 slots enables high performance payloads. Shock-isolated versions are designed to attenuate shock inputs to the chassis to less than 10Gs at the card cage. All components, materials and design concepts are chosen to meet the applicable MIL-STD environments.

Integrated Shock Isolation

The 9U, 12R2 is designed to meet the harsh environment of shipboard, airborne, and ground mobile applications per MIL standards. The front-load card orientation optimizes space efficiency, serviceability and cooling. Highly configurable and shock isolated with front-to-rear air flow with high capacity fans for hot board payloads.

Field-Proven ATR Chassis

Air Transport Racks (ATR) are an important part of air frame electronic systems. Elma's standard and custom ATRs serve in critical defense programs worldwide. Solutions can include backplane and power supplies or complete, application-ready systems.

ATR CHASSIS

AIR TRANSPORT RACK FAMILY

A full line of convection, conduction and liquid cooled ATR (air transport rack) enclosures continue our tradition of providing ruggedized, modular, COTS systems platforms in support of rugged airborne and mobile deployed applications.

Our ATRs get around – serving for over 20 years across critical defense programs!

Features

- Solutions in OpenVPX, SOSA, VME, cPCI and cPCI Serial
- 1/2, 3/4, 1 and 1 1/2 ATRs per ARINC 404A and ARINC 600
- Modular designs for customization options
- Aluminum or aluminum-composite designs
- Custom application I/O panels
- Convection / conduction hybrid systems

Benefits

- Lower cost and lead-time vs. traditional construction
- Optimal thermal performance
- Reduced weight and improved cooling performance

Liquid Cooled ATRs

Extreme application temperatures and high wattage board payloads may require a liquid cooling strategy. Elma's liquid cooled ATR solutions offer field proven aluminum construction with independent dual liquid cooled side walls featuring electron beam welded fluid channels. Liquid cooled ATRs support conduction cooled boards.

Ultra-Rugged ½ ATR

Conduction-cooled with machined heat sinks for high shock and vibration resistance and optimal thermal performance. These ATRs feature optional rear mount fans with space for up to nine 3U cards. VITA 62 pluggable power supplies for OpenVPX systems and custom I/O panels form a solid system foundation.

Mini ATR Small Form Factor

Our mini ATR platforms are ideal small form factor options for space constrained applications. The modular design supports a range of configurations. The rugged, scalable, all aluminum chassis design is available in custom sizes for varying slot counts and is built for a range of air, land and sea environments.

Feature-Packed Small Form Factor Solutions

Reducing size, weight and power (SWaP) is a key driving force in housing defense electronics. Our small form factor enclosures combine Elma's legendary environmental packaging know-how and system integration experience to address those very challenges.

SMALL FORM FACTOR

MISSION AND NETWORKING SYSTEMS

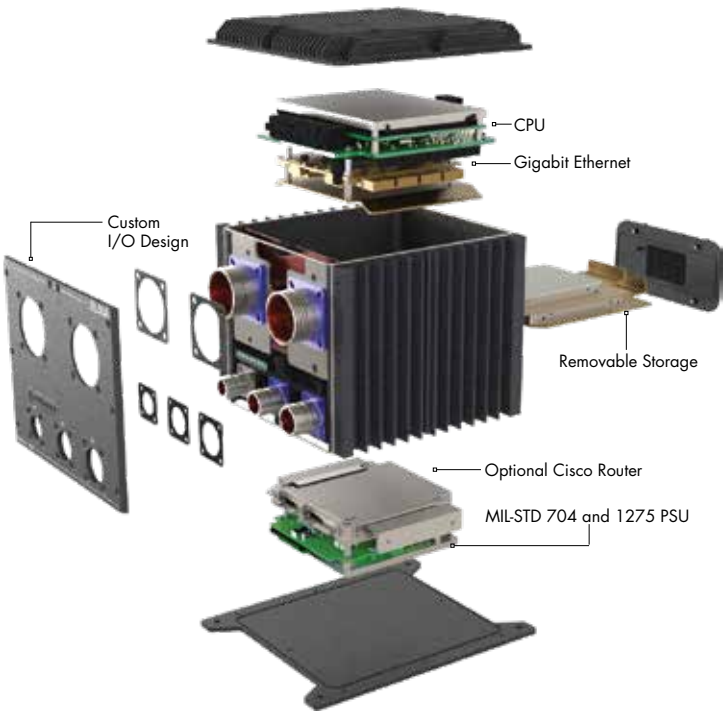
Manned and unmanned military vehicles packed with critical C5ISR equipment drives the need for powerful system solutions that must fit into increasingly tighter spaces. Elma's line up of small form factor systems utilize best in class payload products and leverages our 40 year history as the leading provider of rugged packaging for the toughest environments. Industry standard COTS board sets and a customizable design concept ensure each system will be supported for the long haul with the flexibility for I/O and computational upgrades along the way.

Rugged modular construction designed for a variety of board form factors

- COM Express®, PCI/104, and XMC/PMC
- 3U OpenVPX, 3U SOSA, 3U cPCI and 3U cPCI Serial for Eurocard based SFF systems
- Latest CPU options
- Removable storage
- Custom I/O panels
- MIL-STD-704F & MIL-STD-1275D compliant
- IP67 rated
- MIL-STD-810 rated

Benefits

- Rugged performance
- Fast configuration upgrades
- Long term support
- Engineered for SWaP constrained applications



Rugged Edge Computing and Mission Computer: ComSys

The ComSys-53xx are MIL-STD qualified, rugged COTS-based mission computers based on low-power, high-performance Intel processors with a rich set of I/O in ruggedized small form factor chassis. Configurable design with thermally efficient fan-less operation for reliable performance in harsh environments in mobile ground, shipboard, and air defense applications.

Rugged Edge AI Computing Platform: JetSys

The JetSys-53xx are industrial and MIL-STD qualified, rugged COTS-based Edge AI embedded computing platforms powered by NVIDIA Jetson family of GPGPU system-on-modules in ruggedized small form factor chassis. With multiple camera interfaces, JetSys-53xx are the ideal platforms for vision intelligence applications (object detection and tracking, semantic segmentation, scene understanding, and video surveillance). Targeted for autonomous military vehicles, surveillance, targeting, and electronic warfare (EW) systems for land, air, and sea applications.

Rugged Network Switch and Router: NetSys

The NetSys-53xx are MIL-STD qualified, rugged COTS-based network switches and routers based on Cisco Embedded Series Router (ESR) and Embedded Series Switch (ESS). Targeted for advanced tactical networks for highly secure and reliable high-speed connectivity in communication systems of military hardware in vehicles, aircraft, and ships. Includes Cisco's Advanced Enterprise IOS with Mobile Ready Net solution.

Embedded Boards

Elma is a leading supplier of board products to critical defense programs. COTS and custom, native and partner solutions from the latest open standards like OpenVPX, SOSA, CPCI Serial and COM Express, to legacy VME and CompactPCI standards

EMBEDDED BOARDS

FIELD-PROVEN PERFORMANCE

Our COTS sub-system embedded designs are realized through a combination of best-in-class partner products and Elma's field-proven storage, networking and I/O products – integrated with renowned Elma packaging solutions. Elma has established, long-term relationships with highly qualified industry leaders, teaming to deliver the best solutions for mission critical applications the world over.

As a trusted provider of integrated COTS solutions and board products to the defense industry, we support long-term defense programs with leading-edge technologies and crucial legacy solutions that keep systems up and running.

Features

- 3U and 6U Eurocard form factors
- OpenVPX, SOSA, VME, cPCI, cPCI Serial, PCI/104, COM Express and mezzanine products
- Air and rugged conduction cooled versions

Single Board Computers

Featuring leading edge Intel and ARM-based CPUs, and NVIDIA GPGPUs for high performance computing.

Networking

Fully managed rugged Ethernet and PCIe switches featuring up to 100Gbps on copper or fiber ports.

I/O and Communications Solutions

NVIDIA and AMD based graphics plus, audio, D/A, A/D Serial I/O and MIL-STD 1553 support.

Data Storage

SATA, PCIe and nVME interface solutions – fixed or removable drive solutions in extensible arrays for high speed, multi-terabyte systems.

FPGA Solutions

FPGA board products addressing high-speed signal processing applications.

Development Platforms Support Defense Programs

Development platforms come in many shapes and sizes to support a range of design activities. From our full featured E-Frame - an open access chassis with optional conduction-cooled inserts - to the Type 32 tower/desktop series.

AppliPaks - application development board bundles, serve as both development and deployable board sets for tech refresh support.

DEVELOPMENT PLATFORMS

APPLIPAKS AND SYSTEMS

Taking a new board level product or system from concept to deliverable requires feature-rich development and testing tools. Our CompacFrame and E-Frame test and development chassis platforms are designed for lab use, product development, or as application demonstration platforms.

Elma's broad range of desktop, portable and development chassis for VITA and PICMG bus architectures provide the necessary platforms. All enclosures can be configured with OpenVPX, SOSA aligned, cPCI and cPCI Serial backplanes, with user's choice of slot counts, cooling options, power configurations and system monitoring solutions. Development chassis may be supplied with or without foundational board payloads including SBC, network switching or data storage.

Features

Development platforms support:

- Board payload integration
- Application software development
- Board design
- Signal integrity testing
- OpenVPX and SOSA aligned backplanes

Benefits

- Speed up your development time line
- Access to Elma's range of best-in-class board products
- Wide range of backplanes
- Custom and off the shelf configurations

E-Frame and CompacFrame Development Platform

Type 39 E-Frame and CompacFrame portable development platforms are designed to accelerate the development and testing of plug-in cards (PICs). These development platforms accommodate 3U plug-in cards (PICs) aligned to SOSA and OpenVPX as well as VPX power & ground-only backplanes. They are designed to facilitate customers' new board and/ or system implementations using high-performance CPUs, FPGAs, and GPGPUs for fast signal processing in C5ISR applications.

Portable/Tabletop Development Platforms

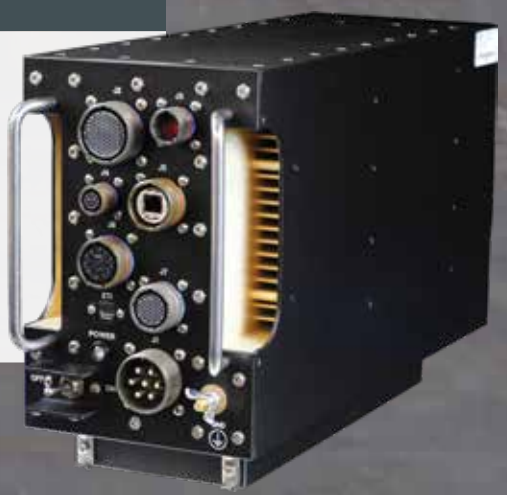
Elma's chassis can be configured with backplanes for OpenVPX, SOSA, cPCI and cPCI Serial, with a choice of slot counts, cooling options, power configurations and system monitoring solutions. Partner boards like SBCs, network switches, data storage and other functions may be included.

Embedded Board Bundles - AppliPaks

AppliPaks have long served in critical defense applications worldwide. The board-level computing assemblies combine a VITA or PICMG single board computer with your choice of XMC/PMC/FMC cards, OS and drivers. AppliPaks are also intended to serve as deployment hardware when ruggedized or conformally coated for the end application.

Integrated Systems and Services

Elma integrated systems are deployed in hundreds of critical defense programs worldwide. Using best-in-class native and partner products, our integration team applies years of experience to deliver real designs. From development to deployment including full lifecycle support, let Elma be your trusted supplier.



INTEGRATED SYSTEMS

19", ATR AND SMALL FORM FACTOR

With trusted COTS products as our foundation, we leverage existing solutions and proven design concepts to deliver integrated sub-systems for the most demanding requirements. With over 50 years of engineering experience, Elma turns your project needs into real-life solutions. We can assist with and manage entire projects from initial system concept to specification, design, manufacturing, test and lifetime support through our worldwide facilities.

Our team has extensive integration experience working with the latest technologies in FPGA, data storage, networking, video, GPGPU and processor products, supplying chassis and cabinet level solutions to defense programs world wide.

Integration Services

- Initial design consultation
- Project management
- Configuration control
- Environmental testing
- Test and documentation
- EOL management
- Spares support

Benefits

- Single source supplier
- Full lifetime support
- Best-in-class payload cards
- Precision-tailored results

Rugged ATR Systems

ATR systems for signal processing, data recording and acquisition, radar systems, beamforming, weapons control systems, and other critical high-speed signal processing for rugged ground vehicle, shipboard and avionics applications.

6U Eurocard System

Avionics ATR platforms for on board data processing, flight controls, weapons control systems and a host of related applications. Systems can be custom designed with up to 4 payload slots for maximum functional performance. Supplied with air assisted cooling and front panel I/O interface.

Small Form Factor Systems

High performance, small form factor mission computing platforms for defense applications where space is at a premium. Modular construction enables recipes including WiFi, mobile routing, 10Gb Ethernet, FPGA and high-speed video I/O and more. Configured with leading-edge CPU options.

Rugged Cabinets and Racks

Our rugged equipment cabinets are lab- and field-tested to ensure mission critical equipment remains up and running under the harshest of conditions. Optima M-series cabinets are trusted to house and protect critical electronics infrastructure in long-running defense applications.

RUGGED CABINETS AND EQUIPMENT RACKS

PROVEN SOLUTIONS

High strength-to-weight ratio is the very foundation of our rugged M-Series Optima cabinet designs. The M-series cabinets are designed to meet all the necessary military standards for challenging rugged and thermal requirements (see below). Racks can be tailored for protection of mission-critical equipment in high shock and vibration defense environments, during seismic activity or other rugged events. The MB-Series Optima cabinets feature a weld-free, bolted design option for applications where this might be required.

Features

- Heavy-duty aluminum extruded single or double walls
- Welded (M1 & M2) or bolted (MB) construction
- Universal base for floor or bolt-down mounting
- Independent, removable side/top/bottom panels and doors
- Integrated cable management, power conditioning & cooling options
- Meets all relevant MIL standards:
  - MIL-STD-901D (shipboard shock)
  - MIL-STD-810G, MIL-STD-167-1A (shipboard vibration)
  - MIL-STD-461F (EMC)
  - MIL-PRF-24317 (military grade powder paint)
- A wide variety of standard and custom sizes available

Benefits

- Custom engineered to specific load requirements
- Modular design reduces installation, upgrade and service time
- Selection of contemporary color choices (custom color matching also available)

M1/M2 Series Rugged Cabinet

Defense, transportation and seismic ready cabinets are field tested to ensure mission critical equipment remains up and running under harsh conditions. M1/M2 cabinets are designed for military and transportation standards compliance, backed by decades of proven design and manufacturing experience.

MS-Series MIL Compliant Cabinet

Hostile environments typically require a rugged rack that can meet or exceed MIL-STDs 810G, 167, 901D, and 461F. Optima's M series rugged cabinet family uses a unique modular construction designed to exceed those standards. It can adapt to the equipment mounting and protection needs of virtually any electronic system.

Battle Tested Integrated Equipment Racks

Elma has been supplying full and partially integrated equipment racks to critical Naval programs for years. Our systems development teams provide solid and reliable turnkey rack level solutions ready for your application hardware and software.

INTEGRATED RACK LEVEL SYSTEMS

RUGGED AND RELIABLE

From vital engine control systems, to weapons control systems and on-board data repositories, Elma is uniquely positioned to act as your single source supplier for integrated 19" equipment racks. We start with the right cabinet configuration from our proven Optima line, then populate systems with the best chassis from our legendary 19"line up. Our integration teams apply years of experience to choose from native and carefully selected partner board products to deliver the required configuration.

Features

- Component level configuration control and life cycle management
- The most advanced custom I/O and cabling methods in the industry
- Exacting functional test and verification
- Complete documentation packages every step of the way
- Cost-effective COTS performance in a rugged mission-ready cabinet
- Rack-level shock and vibration mitigation

Benefits

- Single source repair, support, documentation and procurement services
- Global support for all inquiries
- Keep current with leading edge technology

Sonar Counter Measure Control System

Compact PCI based system with high capacity array storage. Rugged fully machined cabinets offer custom heights to suit specific payload combinations for any board architecture. Optional top or side panel interface for easy access. Fully qualified systems offer full EMC protection and tailored environmental testing.

Spectrometer and Control Electronics

This multi-processor VME based system is in a shock isolated cabinet used for atmospheric information surveillance. It is an air-cooled cabinet featuring multiple I/O interface panels for ready access and connectivity. Machined and fabricated construction, fully qualified for EMC protection and extreme environments. Top mount rugged screen for easy visibility.

Field Deployable ELINT Systems

VME system for electronic intelligence gathering. Leading edge CPUs, high capacity storage, I/O options, system monitoring and custom uninterruptable power supply. Cases support multiple 19" chassis. Portable and impervious to the toughest environments, these integrated systems are ingress protected and shock isolated.

SYSTEM ACCESSORIES

OPENVPX LOAD BOARDS

Development Accessories

Taking on the challenge of creating new embedded systems for your next program requirement is a daunting task. Short time lines coupled with the sensitive high-speed processing requirements of today's cutting-edge systems leave little room for error and no room for going back to the drawing board. Elma's line of test and development accessories help streamline each stage along the way.

Extender Boards

Extender boards in for all major board form factors. Designed to extend plug-in cards outside of the card cage area for easier testing.

OpenVPX, SOSA Aligned Load Boards

Developed to enhance ease of system testing, load boards aid the designer in assuring adequate chassis cooling and verifying that the chassis is capable of meeting the power requirements of the system.

Development Cabling

Compliant to the latest VITA 46 specifications, cabling assemblies are ideal for backplane and system development. They can be used to make I/O and slot-to-slot connections.

Custom RTMs

Rear transition modules (RTMs) for all major board form factors, bring I/O off the backplane to meet test and system configuration requirements.

Chassis Management

Maximizing system uptime is critical. Elma's system management products ensure proper operation of platforms based on OpenVPX, SOSA, and cPCI Serial open standards..

ROBUST POWER FOR DEFENSE

COTS AND CUSTOM POWER SOLUTIONS

Elma's reputation as a highly regarded supplier to US and worldwide defense programs for embedded platforms extends into our power solutions as well. Rugged, battle-ready custom and COTS solutions provide reliable power for military airborne, shipboard, ground and mobile applications - where failure is not an option.

Features

- Pluggable modules to meet OpenVPX / SOSA profiles
- MIL-STD-704 and 1275 compliance
- PCI/104 SFF and stand-alone versions
- Power distribution solutions

Benefits

- Choose from field-proven solutions
- Work with our experienced integration team
- Native and partner products
- Rely on Elma's 30-plus year track record

PCI/104 and Stand-alone Power Supplies

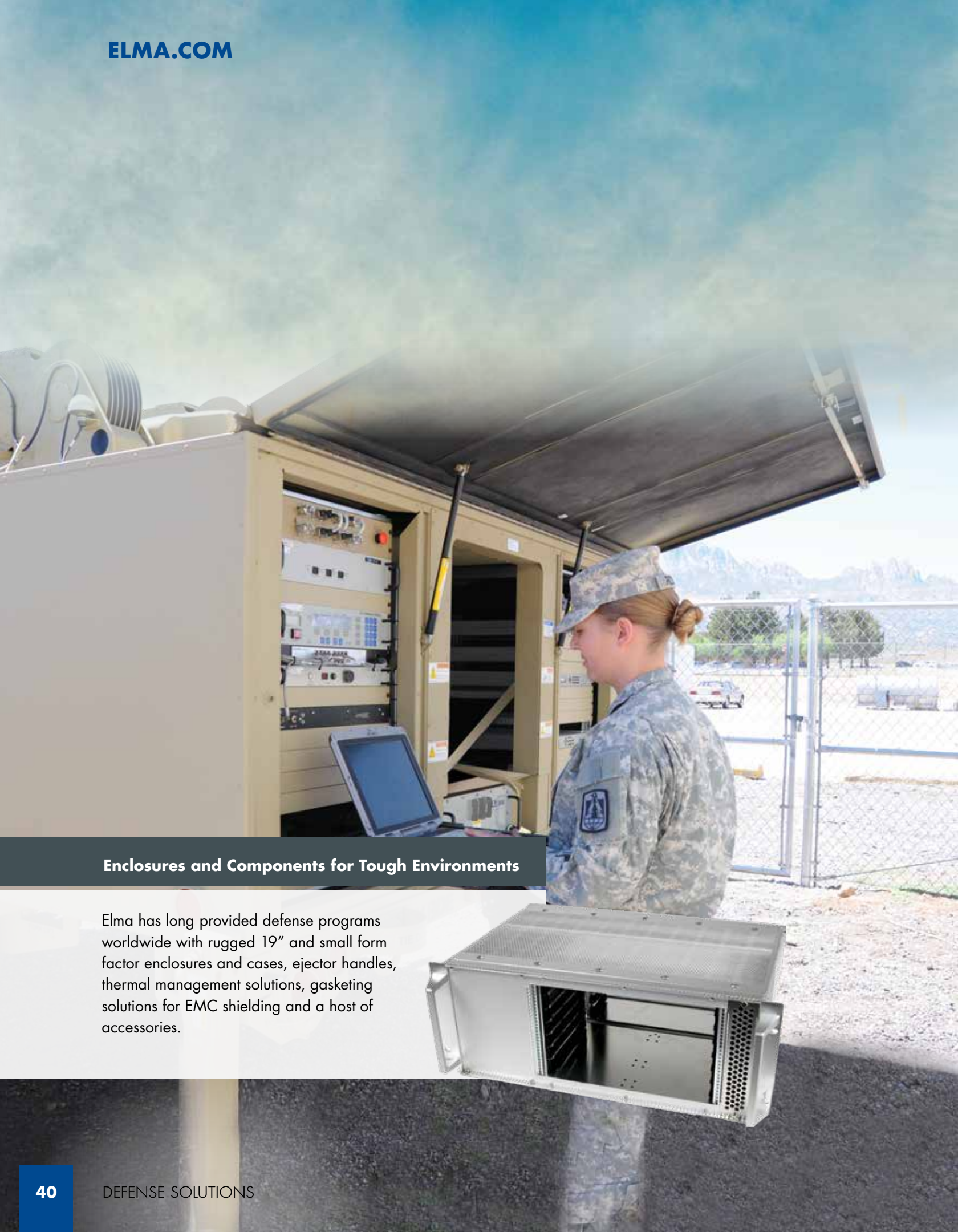
Compact and rugged MIL isolated power supplies for PCI/104 or COM Express systems. For critical power conditioning in defense applications requiring MIL-STD-1275D or MIL-STD-704F power isolation. MIL-STD-461D compliant models feature a range of I/O power options and performance in extended temperatures.

VITA 62 Compliant Solutions

Elma supplies and integrates a range of conduction-cooled power supplies for VITA 62 / OpenVPX / SOSA profiles. In-house and partner designs in 3U and 6U form factors offer DC-DC and AC-DC power options plus MIL-STD 704 power isolation and up to 1500W per slot.

Custom Power Distribution

Rugged power synchronization and distribution solutions for use in avionics platforms including both fixed and rotary wing aircraft. Elma's power product experts provide fully-contained and application-specific systems for critical defense applications needing custom connectivity.



Enclosures and Components for Tough Environments

Elma has long provided defense programs worldwide with rugged 19″ and small form factor enclosures and cases, ejector handles, thermal management solutions, gasketing solutions for EMC shielding and a host of accessories.

ENCLOSURES AND COMPONENTS

FIELD-PROVEN

Rugged, Tested and Ready for Service

Our Type 53 rugged extruded aluminum small form factor enclosures provide exceptional protection from the elements for board paylaods in mission-critical applications. Extensible designs allow easy expansion for a range of board stacking heights and tailored sizes for SWaP-constrained spaces. Enclosures are built tough for payloads supporting PC platforms, network infrastructure or I/O specific multi-functional computers in air, sea and land installations.

Features

- Small lightweight construction
- Extensible design for multi-board stacks
- Custom front panels to suit your specific I/O sets
- Optional IP67 for extended ingress protection
- Custom colors for your intended purpose
- Superior cooling performance

Benefits

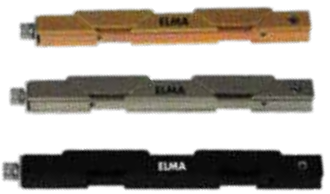
- Designs enable fast configuration upgrades
- Rely on Elma for thermal management solutions
- Leverage Elma's system integration know-how

IEEE Injector/Ejector Handles

Elma offers a variety of IEEE injector/ejector handle types for hot-swap or non-hot-swap operation. Commonly used on OpenVPX, VME and cPCI Eurocard and custom boards, our handles provide ease of insertion and secure latching to ensure robust performance in demanding applications. Defense programs rely on Elma's injector / ejector handles to prevent board dislodging under excessive shock and vibration conditions.

EMC Shielded Front Panels

Sensitive OpenVPX, VME and cPCI systems often operate in environments prone to electromagnetic emissions. Our front panels for 3U, 6U, 4HP and 5HP Eurocard boards provide the necessary protection, with EMC shielding on sturdy and lightweight extruded aluminum models.



Card Edge Retainers

SureLock card edge retainers provide solid mechanical rigidity against high levels of shock and vibration for circuit cards used in defense environments. SureLocks are mounted directly to the board or it's heatspreader and inserted into an aluminum channel in the cold plate. Adjustment screws enable consistent surface to surface contact providing a conductive cooling path from hot circuit card components to a cold plate or to the extruded side walls of an enclosures.

Unmatched Rotary Switches and Encoders

Elma is the premiere supplier of battle tested rotary switches and encoders. For air, sea and ground equipment installations plus handheld applications, our range of products perform in extreme heat, shock and vibration environments and provide high IP ratings for proven long term and reliable performance.

ROTARY SWITCHES AND ENCODERS

FIELD-PROVEN

Rotary Switches and Encoders with a history of success

Elma's 50+ years of experience in rotary switches, coded switches and encoders is written in the pages of our customer's success stories. From critical communications equipment that keep worldwide defense operations safe, to mission critical weapons control systems, engine controls, cockpits and intelligence gathering equipment, Elma has the standard or custom solution that gets the job done.

Features

- Swiss Click Indexing System™ for positive tactile feedback and secure activation
- Coded switches with "Push/Pull-to-Turn"
- Dual concentric encoders
- Up to 32 detents for increased functional granularity
- Gold plated contacts
- Robust metal housings with metal shaft
- IP68 front panel sealing
- Push button force and rotational torque options

Benefits

- Elma - single supplier for a multitude of solutions
- Experienced support team
- Proven reliability ensures your success

Compact, Robust Solutions for Tight Spaces

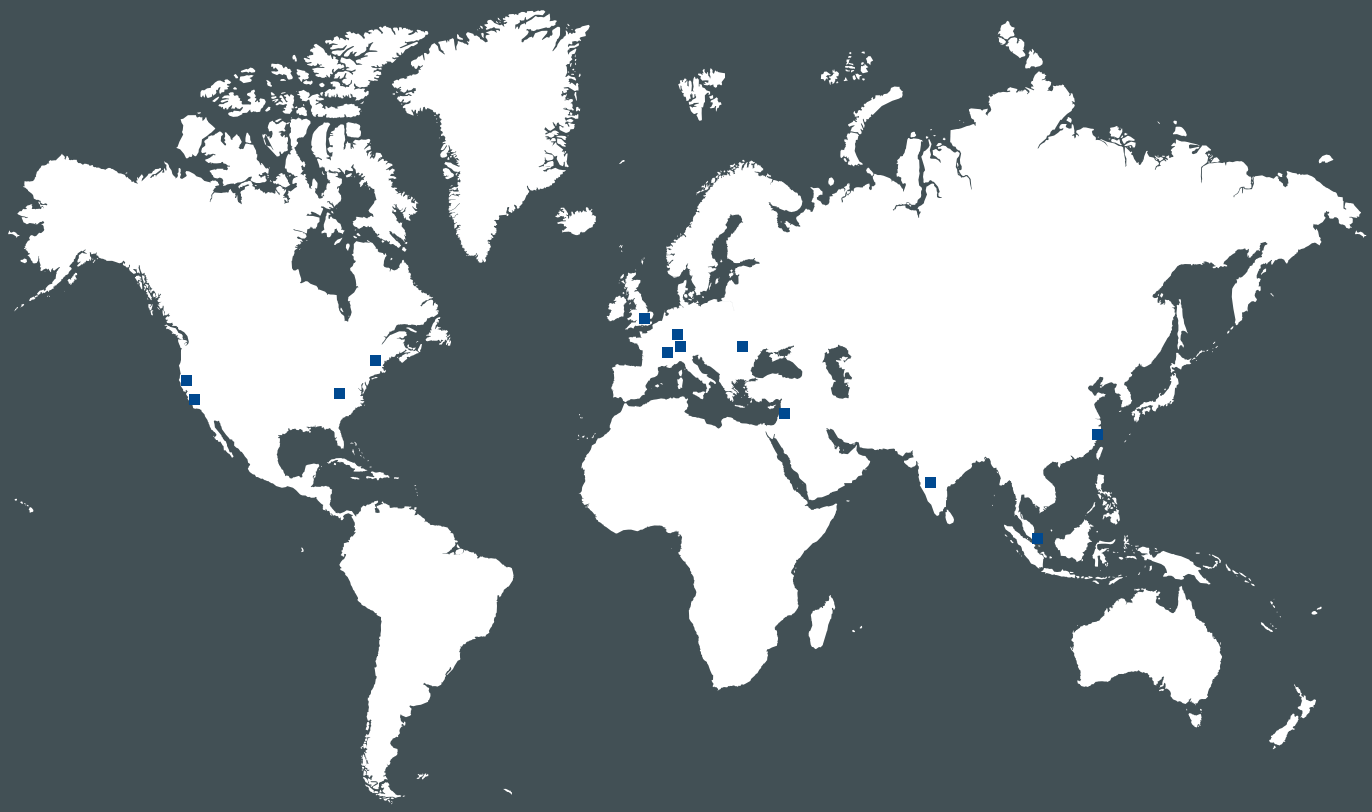
Incremental encoders feature the highest operational performance in a minimum of space for portable devices and other space constrained placements. The MR50 is designed to meet the many special demands found in the area of target and night-vision devices, two-way radios, and most in-vehicle cockpit-applications.

Pushbutton Dual and Single Encoders

Our E33 and E37 encoders boast a unique combination of ruggedness and a wide range of options while providing an excellent indexing feel. These high-quality, cost-effective dual concentric encoders can be configured with or without push-button actuation. 1,000,000 revolution rotational life for demanding applications.

Safety Enhanced Coded Switches

Safety requirements must guard against accidental actuation to avoid mission interruption. Our 07 P2T encoders feature push to turn or pull to turn operation to prevent unintended actuation. For use in close quarters such as cockpits or command and control systems in ground and sea equipment.



Elma Electronic AG, Switzerland
Hofstrasse 93
CH-8620 Wetzikon
T: +41 44 933 41 11
F: +41 44 933 42 15
sales@elma.ch

Elma Electronic GmbH, Germany
Stuttgarter Strasse 11
D-75179 Pforzheim
T: +49 7231 97 34 0
F: +49 7231 97 34 97
info@elma.de

Elma Electronic France SA
16 rue de Hannah Arendt
Parc des Forges
F-67200 Strasbourg
T: +33 38 85 67 25 0
sales@elma-electronic.fr

Elma Electronic UK Ltd.
Solutions House
Priory Business Park
Fraser Road
Bedford MK44 3BF
Great Britain
T: +44 1234 838822
F: +44 1234 836650
sales@elma.co.uk

Elma Electronic Romania SRL
Chisoda, DN 59 km8 + 550m
RO-307221 Judetul Timis
T: +40 374 480 400
F: +40 256 249 820
sales@elma.ch

Elma Electronic Israel Ltd.
34, Modi'in St., I.Z.Sgula
IL-49271 Petach-Tikva
T: +972 3 930 50 25
F: +972 3 931 31 34
sales@elma.co.il

Elma Electronic Inc., USA
44350 S. Grimmer Blvd
Fremont, CA 94538, USA
T: +1 510 656 3400
F: +1 510 656 3783
sales@elma.com

Optima Stantron, USA
2305 Newpoint Parkway
Lawrenceville, GA 30043, USA
T: +1 770 496 4000
F: +1 770 496 4026
sales@elma.com

Elma Electronic Private Ltd., India
Green Arch
3rd Phase 1st Main
J.P. Nagar
Bangalore 560078
sales@elma.com

Elma Electronic Technology (Shanghai) CO., LTD., China
No. 11 Building, No198
Chang Jian Road,
Bao Shan District
CN-200949 Shanghai
T: +86 21 5866 5908
F: +86 21 5866 5918
sales@elmachina.com

Elma Asia Pacific Pte. Ltd., Singapore
8 Ubi Road 2
07-14 Zervex Building
SG-408538 Singapore
T: +65 6479 8552
F: +65 6479 8662
sales.elmaap@elma.com

Your local solution partner

Edition 01/23