



**CONNECT AND PROTECT**

## Defense & Aerospace

- Rugged Enhanced Mechanics
- High-Speed Backplanes
- Performance in Harsh Environments
- Rapidly Deployable Solutions
- Compliance with Defense Requirements
- VITA 46.11 System Management Solutions

  
nvent

**SCHROFF**

## ABOUT NVENT

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nVent Electric is a leading global provider of electrical connection and protection solutions. We believe that safer systems ensure a more secure world. We design, manufacture, market, install and service high-performance products and solutions that connect and protect some of the world's most sensitive equipment, buildings and critical processes. We operate three business segments: Electrical & Fastening Solutions, Thermal Management, and Enclosures.



## ABOUT NVENT SCHROFF

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The SCHROFF brand is nestled within the Enclosures business segment of nVent. SCHROFF contains a broad portfolio of products from printed circuit board (PCB) accessories, such as card retainers, conduction cooled frames, front panels and handles to subracks, cases, backplanes, power supplies, cabinets and pre-assembled chassis for embedded computing systems. nVent SCHROFF includes the Calmark and Birtcher product lines and has been a world leader in electronics packaging for over five decades.





# PERFORMANCE & DEPENDABILITY

## FOR MISSION-CRITICAL SYSTEMS

For over five decades, nVent SCHROFF has been a world leader among developers and manufacturers of electronics packaging components and systems. Whatever challenges you have to overcome, together we can find the right solution. We specialize in manufacturing components that can stand up to harsh environments, rugged applications, and extreme conditions as well as shock and vibration applications needs.

Our products and complete solutions combine the know-how of our specialists in the integration of mechanics, electronics, and thermal control together with many years of experience and the most diverse application requirements to maximize our customer's size, weight, and power requirements.



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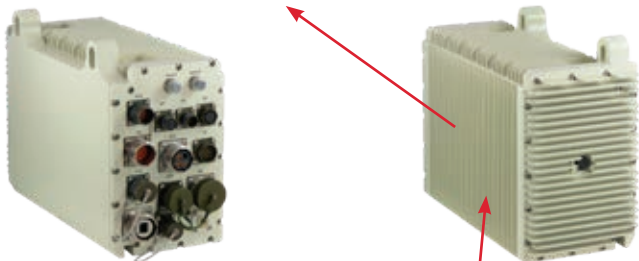
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nVent SCHROFF's products are based on globally standardized product platforms that support rapid, futureproof and cost-effective development. We can offer the following services all under one roof:

- Design
- Project management
- Prototype and model construction
- Testing
- Certification
- Pre-production
- Series production

We can provide fully-equipped and verified systems from a single source quickly and tailored to your specific requirements and we will remain a reliable partner throughout the entire lifecycle of your products, worldwide.

Surface to conduct heating



MIL connectors

Fan to cool the heat sink



# KNOW-HOW AND COMPETENCE FOR NETCENTRIC WARFARE

COMPONENTS AND SYSTEM SOLUTIONS FOR LAND-BASED, NAVAL AND AEROSPACE APPLICATIONS

## INCREASED PERFORMANCE. UNCOMPROMISING AVAILABILITY

"Network-centric warfare" is the challenge for the 21st century. More than ever before, success depends on the capability to rapidly gather and distribute specific information. High-speed data transfer, system availability and mission-critical reliability are crucial in the defense world today. Communications equipment must be capable of rapid deployment and ensure interoperability with the existing platform even in the most extreme environments. Cutting-edge rugged COTS-based technology from nVent SCHROFF ensures the best return for your investment.

## SECURE PROTECTION OF YOUR ELECTRONICS, INCLUDING MIL-CERTIFICATION

- Superb mechanics
- High shock and vibration resistance
- Perfect shielding
- Optimized cooling
- Dependable power supplies
- Outstanding system management

OUR TECHNICAL KNOW-HOW - CRUCIAL FOR TODAY'S MILITARY MISSIONS.



**DEPENDABLE SOLUTIONS FOR EVERY OPERATING ENVIRONMENT**

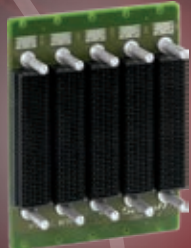
Communications play a pivotal role in military operations. Whether it be on ships, tanks, ground control stations, combat aircraft or on unmanned air vehicles, our modular product platforms, specific applications expertise and cutting-edge technology allow us to offer individual solutions for every operating environment.

**SPACE**

**AIR**



**Rugged system**



**High-speed rugged backplanes for modern military use**

**NVENT  
SCHROFF  
RUGGEDIZED  
SOLUTIONS  
FOR TOUGH  
ENVIRONMENTS**



**Shock-mounted MIL 901D cabinets**

**LAND**

**SEA**

# COTS-BASED SYSTEM SOLUTIONS FROM A SINGLE SOURCE

## CUTTING-EDGE TECHNOLOGY FOR HIGH-SPEED MILITARY NETWORKING

### nVENT SCHROFF MILITARY SOLUTIONS

While meeting your strict design specifications, you can be assured that the backplane, chassis, cooling, power supply and system management, including all interfaces, will be selected and integrated for optimal performance. This provides our customers with a clear advantage, since a solution can be developed and provided quickly, all under one roof.

- Reinforced mechanics
- High-speed backplane
- Performance across a wide temperature range
- Dependable power supplies
- Chassis or shelf management
- Leading edge system management solutions

### UNCOMPROMISING PERFORMANCE

The demands of today's digital battlefield require the highest standards of performance. Rapidly gathering, distributing and utilizing information, military aerospace communications systems have to perform even in worst-case scenarios. Whether the mission-critical system is C5ISR, ISTAR, FADEC or ELMS, the basic requirements are dependability and high performance at a reasonable cost and in a small form factor.

### COMMUNICATIONS TECHNOLOGY EXPERTISE

nVent SCHROFF has a long established record in delivering electronics packaging solutions for communications and high-speed data transfer. Modern connectivity requires serial backplanes, greater signal density, and a larger power budget. Equipped with the latest technology, our systems solutions provide access to real-time information, allowing for highest data throughput for maximum processing power.

### COMMITTED TO RUGGED COTS PRODUCTS

nVent SCHROFF brings an uncompromising commitment to performance for rugged applications: With Card-Lok retainers, conduction cooled assemblies, 19" subracks, basic military systems and 901D cabinets, our rugged COTS range delivers the optimum combination of performance, reliability, cost and rapid time-to-market.

OUR CUTTING-EDGE ENGINEERING - RELIABLE NO MATTER THE SCENARIO



Titan: modular rugged enhanced technology

## RAPID DEPLOYMENT PLATFORM SYSTEMS

Whether stationary or mobile, conduction or forced-air cooled, we can draw from our extensive platform capabilities to offer a COTS-based solution tailored to your specific requirements in a timely manner. No matter what your general specification may encompass - high shock and vibration requirements, EMC shielding, special MIL specification finishes, conformal coatings and even perhaps mountable with telescopic slides, we have a ready-made solution. Our continuing commitment to various architectures - VMEbus, VXS, CompactPCI, AdvancedTCA, MicroTCA and now also OpenVPX - ensures the best possible future-proof solution.

## SWaP: HIGH PERFORMANCE IN A SMALL FORM FACTOR

For many applications such as UAVs and indeed for general platform upgrades, space, weight, and power (SWaP) are at a premium. Our investment in a 3U VPX conduction cooled portfolio demonstrates our commitment to providing optimum performance with minimal real estate.

## DOUBLE BENEFIT: BANDWIDTH AND LEGACY NEEDS

Our current investment in OpenVPX and VITA 46.11 compliant system management technologies provides for future requirements and is a valuable option for legacy platform upgrades.

## RESISTING SHOCK AND VIBRATION

With these harsh environments in mind, our cabinets, cases and subracks are designed to protect the maximum mechanical performance of the electronics and to provide shock and vibration resistance.

## WITHSTANDING HARSH ENVIRONMENTS

From individual components to the integrated system, our military networking hardware provides a physical construction capable of withstanding extreme conditions such as low atmospheric pressure, exposure to extreme temperature ranges, high EMC shielding and radiation requirements, and negative impacts from sand and dust, rain, humidity, fungus, salt spray, and salt fog.



VARISTAR MIL 901D cabinet

More Information  
Scan Code



## BENEFITS AT A GLANCE

- Complete: Mechanical, electrical, electronic, and thermal competence from a single source
- Rapid: Reduced development time by leveraging high volume board and system de-signs
- Robust: Proven track record with nVent SCHROFF for over years
- Secure: Shock and vibration resistant to MIL-STD-901D
- Protected: Conformal coating as a standard feature

# CARD RETAINERS AND CONDUCTION-COOLED ASSEMBLIES

## RUGGED PRINTED CIRCUIT BOARD RETAINERS COMPLETE SOLUTIONS AT MODULE LEVEL

nVent SCHROFF's Birtcher and Calmark product lines are the industry leader in the manufacture of ruggedized components that hold boards in place and transfer heat in demanding defense and aerospace applications. The product lines include card guides, Card Lok retainers, PCB retainers, and metal inserters / extractors.

### VITA 48.2 RETAINER CONFIGURATIONS

#### Primary-side placement Retainers

(Card Loks, Wedge-Loks) oriented on the primary side of the PCB. The main thermal interface to the cold-plate slot is through the secondary-side cover flanges.

#### Secondary-side placement

Retainers oriented on the secondary side of the PCB. The main thermal interface to the cold-plate slot is through the primary side cover flanges. While providing a better thermal path from the PCB components to the cold plate, this implementation reduces the available PCB areas.



Secondary clamshell

Primary clamshell



More Information  
Scan Code

### DESIGN FLEXIBILITY

Different lengths, individual wedge dimensions, the relocation or addition of mounting holes, or even different hardware, materials and finishing - our product range provides a broad variety of configurations allowing us to meet your application needs.



### INNOVATIVE HIGH PERFORMANCE PRODUCTS FOR THE TOUGHEST APPLICATIONS



#### High Clamp Force Card Loks

- 3X clamp force over traditional Card Loks
- Family of small profile, high clamp force Card Loks that are drop-in replacements



#### High Thermal Card Loks

- Achieve 15% increased thermal performance over similarly sized Card Loks
- Drop-in replacements



Large selection of off the shelf nylon and metal inserters and extractors



### BENEFITS AT A GLANCE

- Secure:** Maximum clamping force for high shock and vibration resistance
- Efficient:** Maximum thermal heat transfer for cold-wall applications
- Usability and SWaP:** Sophisticated design for easy insertion and lighter weight
- Flexible:** Special lengths, finishes, screw head styles or other design options available



## CONDUCTION COOLED ASSEMBLIES (CCA'S)

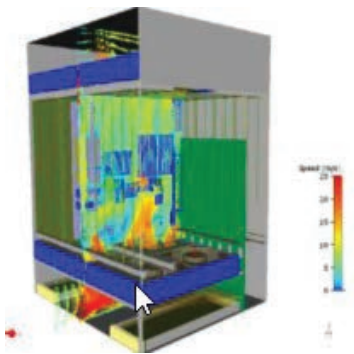
nVent SCHROFF Conduction Cooled Assemblies are designed for circuit boards requiring cooling in severe environments where convection cooling cannot be used. The assembly also provides needed structural support of the plug-in module in high shock and vibration environments.

- Downloadable standards compliant CAD templates for easy modification

- Includes peripheral components such as Card Loks and extractors 3U and 6U templates available for Vita 46, Vita 48.2, VME, and CPCI
- Save time and sourcing costs by managing the entire assembly with one part number
  - ESD protected packaging available
  - Kits can include thermal pads, EMC gaskets, and labeling per customer requirements



## IN-HOUSE DESIGN ENGINEERING EXPERTISE



Thermal analysis capabilities enable the highest performance designs.

- Collaborate with our experts to perform thermal analysis using software such as 6Sigma and overcome cooling challenges



Torque Limiting Card Loks Eliminate the need for specialized or calibrated tools in the field.

- Partner with our experienced engineering team to ensure your design is compliant with required standards
- Accelerate your design process with 3D printed CCA's and frames for fit checks



Skylines and heat sinks can be machined per application requirements

## DESIGNED FOR TWO-LEVEL MAINTENANCE

The need to simplify and streamline maintenance has resulted in Two-Level Maintenance requirements. Conduction cooled assemblies can be equipped with Torque Limiting Card Loks and Series 311 Tolerance Compensating Extractors to better meet Two-Level Maintenance Requirements.

Series 311 extractors provide

- Self-compensation for board tolerances
- Positive pressure on connectors during Card Lok actuation
- Compliant with VITA 48.4 & 48.2
- Provides 10:1 mechanical advantage



More Information  
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## BENEFITS AT A GLANCE

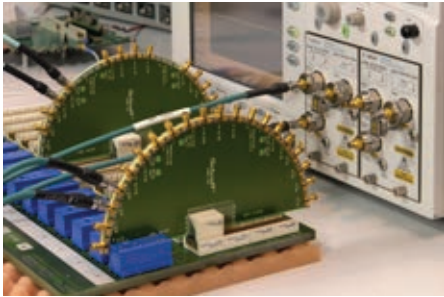
Strong:	Aluminum for high thermal conductivity and lightweight support
Robust:	Machined from a single piece for high heat transfer and structural support
Large selection:	Available in black anodize, chemical film, electroless nickel plating and custom silkscreen
Reliable:	Locking threaded inserts in extreme vibration environments, and extractors provide ample force to disengage board connectors easily

# BACKPLANES

## THE HEART OF HIGH-SPEED SERIAL DATA COMMUNICATION

### THE RIGHT PARTNER FOR CUSTOMER-SPECIFIC MODIFICATIONS

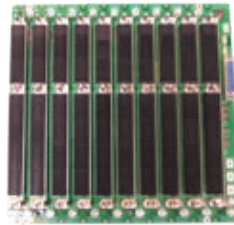
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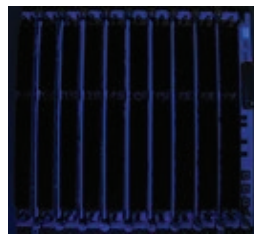
Signal integrity measurement

### PROTECTED FOR HARSH ENVIRONMENTS

When your equipment is installed in harsh environments, the electronics must be protected against fungus, salt spray and other aggressive substances. We have the in-house capability to provide each backplane with a conformal coating to MIL-STD-810E, DIN 50155 and UL94V-0 specifications.



Backplane Conformal Coated



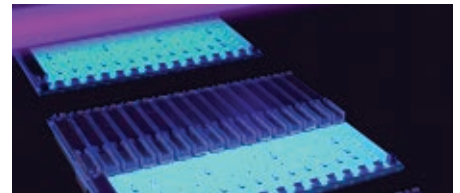
... under UV-Light test

### STEPPING SAFELY INTO THE HIGH-SPEED FUTURE

The defense market embraces new technology and so does nVent SCHROFF.

With the VPX specification VITA 46.0 and the Open VPX specification for VITA 65, the defense market has moved from parallel (VME) to high-speed serial data communication.

We are an active member at the VITA standardization group. With more than a decade of experience in high speed AdvancedTCA, MicroTCA, CompactPCI Serial, VPX and VXS backplane design, Schroff is the right partner to assist you in advancing from parallel bus to serial data transfer.



In-house conformal coating process

### SIGNAL INTEGRITY SIMULATION AND MEASUREMENT

nVent SCHROFF is an active member of VITA and PICMG as well as of IEEE, PCI-SIG, PXI-SA. We are proud to have:

- More than 20 years of experience with VME and CPCI
- Nearly 20 years experience with ATCA, MTCA, CPCI Express, PXI
- More than 10 years experience with CPCI Serial, VPX, VXS

Our newest product category, COM-Carriers, and our newest product family updates – PXI Express chassis (including PCIe-Switching and –Bridging) show our drive to connect and protect your electronics in the most cutting edge and innovative ways when the mission is critical. When it comes to high speed backplane simulation, design, manufacturing and validation rates beyond 100Gbps are part of our capabilities. We work with our customers on various customer-specific backplanes/ systems for aerospace and defense as well as other markets.



More Information Scan Code

### BENEFITS AT A GLANCE

High capacity:	Superior signal integrity to provide up to 100 Gbit/s data transfer per lane and higher data rates are available upon request
Leading-edge technology:	High-speed simulation and measurement capabilities
Complete capability:	In-house conformal coating
Superior quality:	100% backplane testing to guarantee superior quality

# RUGGEDIZED SUBRACKS

## PROTECTION FOR HARSH ENVIRONMENTS

### WITHSTANDING EXTREMES OF SHOCK AND VIBRATION

nVent SCHROFF rugged subracks have passed the following testing:

- MIL 810 G
- MIL 901 D
- IEC 61587-1, DL2
- IEC 61587-1, DL3
- VG 95373, part15

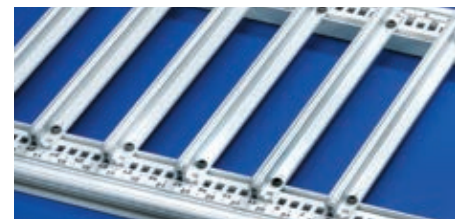
With a modular approach, our subracks are available in three levels of ruggedization. Readily available product platforms are configurable to fulfill your individual needs. From standard industrial to robust transportation, light military use and rugged-level products (1g up to 25g), we have the right solution.

### SPECIFICATIONS

- Standard passivated surface treatment
- Individual surface treatments such as yellow chromate or to customer's specification
- MIL-C-5541 Class 1A, Gold
- EMC shielded standard solution available
- Aluminum guide rails can be screwed to horizontal rails
- Available with nVent SCHROFF Calmark and Birtcher retainers

### RUGGED SUBRACKS

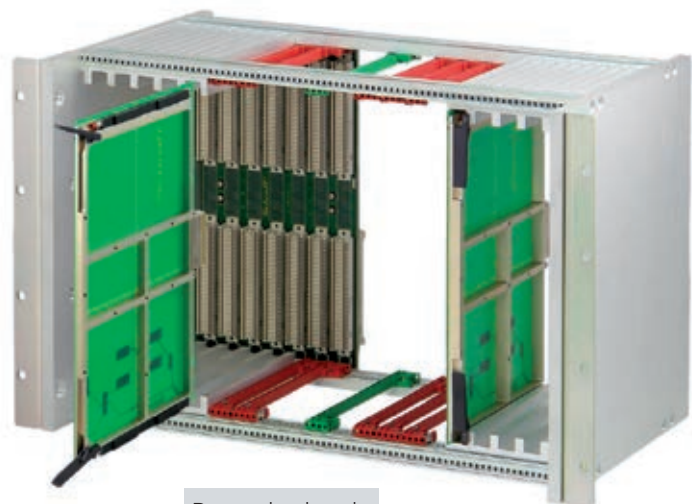
- Reinforced side panels, 19" brackets and top/bottom covers with additional mounting positions to horizontal rails
- Aluminum horizontal rails with 3 fastening points for harsh environments
- Aluminum guide rails (one piece)



Rugged metallic card guides



Plug-In Module



Rugged subrack

Optional rugged card guides with enhanced clamping function



More Information  
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### BENEFITS AT A GLANCE

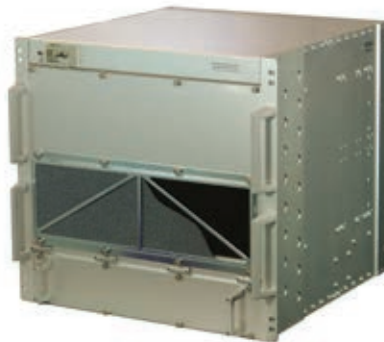
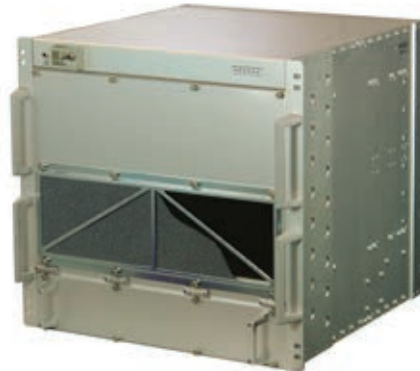
From a single source:	All competencies under one roof
Modular toolbox:	Multiple ruggedization levels
Adaptable:	Retainer options enabling upgrade to increasingly higher levels performance according to shock and vibration requirements
Modification:	Service for prototypes to production

# RUGGED SYSTEMS & VPX

## A COMPLETE SYSTEM COMPRISED OF OUR RUGGED 19" SUBRACKS AND VPX BACKPLANES

### EVOLVING VPX MARKET

nVent SCHROFF has seen the VPX market expand from a market completely dedicated towards customized solutions to military COTS and even into other market spaces like Energy and Railway. As SWaP requirements increase, we see VPX replacing VMEbus or CPCI Systems in rugged 19" applications.



### PRODUCT FAMILY INNOVATIONS

To meet this changing market demand, nVent SCHROFF has come up with a solution to our customer's rugged systems needs. Our COTS System family of products for harsh environments offers:

- Designs based on nVent SCHROFF's rugged Subrack for 25g shock and 3g vibration
- Forced air flow with front to back cooling and fan speed control (front removable fan tray)
- Space for up to 4 pluggable PSU's, wide range AC or 24V DC input on the rear
- Provisions for telescopic slides
- System status LED on the front side
- 6 U card cage for a maximum of 16 slots
- Hinged front and rear panel

### BENEFITS AT A GLANCE

Flexible:	Meeting specific design requirements thanks to modular product platforms that form the basis for individual solutions
Fast:	All design, manufacturing and testing resources under one roof to ensure rapid time-to-market
Secure:	Backplanes and electronic components' simulation, development, production and testing – complete in-house capabilities
Reliable:	Efficient cooling optimized by air measurements and heat simulations in a climate controlled laboratory

# RUGGED 19" SYSTEMS

## MECHANICS AND ELECTRONICS FROM A SINGLE SOURCE

### RUGGED 19" SYSTEMS

Based on our standard rugged subrack and system program, we offer a wide range of solutions. With our broad experience we can easily adapt to your specific requirements for wide temperature ranges, high shock and vibration levels, and extremely harsh environmental conditions.

### TYPICAL CUSTOMER REQUIREMENTS

- Reinforced side panels, horizontal rails and covers; screws and other fasteners in stainless steel; prepared for telescopic slides
- High-speed VXS or VPX backplane
- Controlled air cooling concept from front to rear side
- Dependable 19" power supplies with 1000 W total output power
- Chassis monitoring module for monitoring voltages, temperatures and digital inputs
- Optional communication and remote monitoring via RS 232 or Ethernet interface
- EMC shielded subrack
- Electronic components such as backplane, adapter panels, control modules and power supplies can be conformal coated upon request



Electronic components including backplane, adapter panels, control modules and power supplies can be conformal coated

### Typical specifications:

MIL-HDBK-217F	Reliability Prediction of Electronic Equipment
MIL-STD-1472F	Human Engineering Design Criteria for Military Systems, Equipment and Facilities
MIL-C-38999 Series	Connectors
MIL-STD-810D	Environmental Test Method and Engineering Guidelines
MIL-STD-461D	EMC Compatibility
MIL-STD-2036	General Requirements for Electronics Equipment Specification

### BENEFITS AT A GLANCE

Flexible:	Meeting specific design requirements thanks to modular product platforms that form the basis for individual solutions
Fast:	All design, manufacturing and testing resources under one roof to ensure rapid time-to-market
Secure:	Backplanes and electronic components' simulation, development, production and testing – complete in-house capabilities
Reliable:	Efficient cooling optimized by air measurements and heat simulations in a climate controlled laboratory

# THE NEXT LEVEL: TITAN

## EXCEL IN EXTREME ENVIRONMENTS

### RUGGED ENHANCED SYSTEMS

Working from REDI (rugged enhanced design implementation) VITA 48.2 as a basis, we have developed a modular conduction cooled chassis. This enclosure utilizes high-grade machined aluminum alloys and protective chemical finishes combined with the latest technology in design and machining to achieve a tightly toleranced system.

### QUICKLY DEPLOYABLE HIGHLY SECURE

Controlled assembly processes provide a complete, highly rugged, cost effective, and environmentally sealed enclosure. To ensure rapid time-to-market deployment and quick development, these systems can easily be configured with a custom front I/O panel to support your unique system configuration. nVent SCHROFF can also engineer a modified backplane interconnect and customize power requirements as needed.

### RUGGED CONSTRUCTION

- Various Mil-aero grade materials available available (EN AW6062, 6082, 7075, etc.)
- Full IP/EMC gasketing options available
- Variety of finishes available such as anodize, alodine 1200, electroless nickel, Sur-Tec or powder coating for external surfaces

7 slot 3U VPX Titan chassis, available with Birtcher 3U VPX clamshell, vertical and horizontal mounting options; various modular design options available

### MODULAR DESIGN. FULLY CUSTOMIZABLE

- Allows Type 1 or Type 2 plug-in units
- Accepts plug-in units with optional connector protection
- Available with 0.8", 0.85", and 1" slot pitch
- Allows a variety of external heat dissipation options such as heat sinks, forced air and liquid cooling

### NEW TITAN SERIES

Titan is designed in accordance with the VITA 48.2 mechanical specification for microcomputers using REDI conduction cooling applied to VITA 46. This allows a variety of open-standard bus architectures that Schroff already provides including VPX, VME, CompactPCI, CompactPCI Serial, CompactPCI Plus IO, and VME64 extensions that conform to the IEEE standard for mechanical core specifications for conduction-cooled Euroboards.

### COOLING



Basic



Heatsinks



Forced Air



### BENEFITS AT A GLANCE

Complete:	With Schroff VPX backplane, fully modular design for maximum flexibility
Robust:	Machined aluminum construction with IP/EMC gasketing options for severe environments
Powerful:	Optimized heat transfer and dissipation, extreme shock and vibration protection

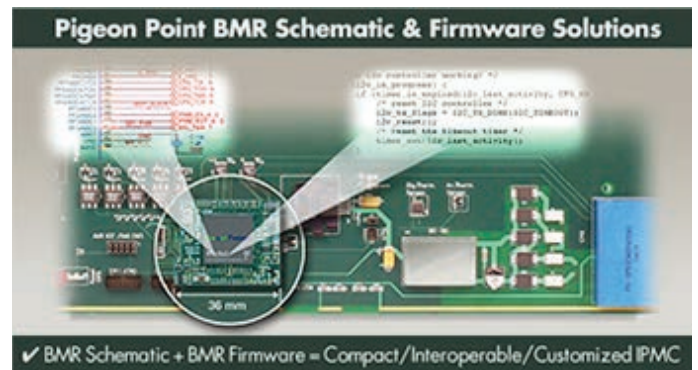
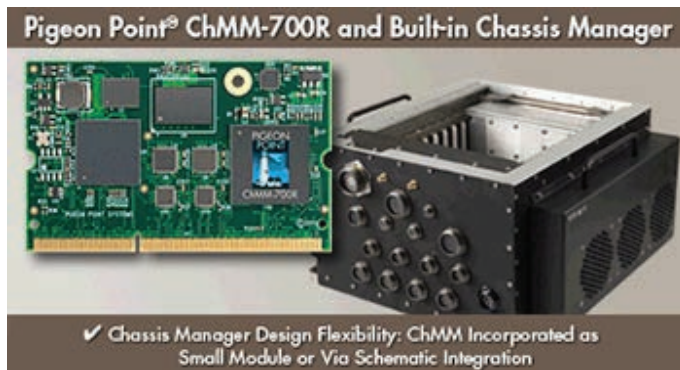
# VITA 46.11 SYSTEM MANAGEMENT SOLUTIONS

MECHANICS AND ELECTRONICS FROM A SINGLE SOURCE

[www.pigeonpoint.com/products\\_vita.html](http://www.pigeonpoint.com/products_vita.html)

## VPX CHASSIS MANAGER & BOARD MANAGEMENT REFERENCE

- **Bench Top Hardware**
  - Immediate hands-on familiarization and "known-good" reference as you bring up your chassis or module
- **Reference Schematics**
  - ChMM carrier or BMR schematics as starting point for your custom carrier design or board design; optionally, schematics of the ChMM itself can be licensed
- **Firmware Modifications**
  - Adjustments to the Chassis Adaptation Layer in the Pigeon Point Chassis Manager for your chassis
- **One Year Of Technical Support**
  - Both hardware and firmware; includes schematic review of your design after you have integrated the PPS-supplied schematic
- **Comprehensive Documentation**
  - Covers hardware and firmware; targets both the chassis / board developer and chassis / board user



nVent SCHROFF Pigeon Point Solutions are the state of the art for IPMC (Intelligent Platform Management Controllers)

## COMPLETE CHASSIS MANAGER MODULE WITH CARRIER

- Complete VITA 46.11 Chassis Manager
- 3U VPX form factor carrier module
- System ready solution
- Available integrated with chassis solutions

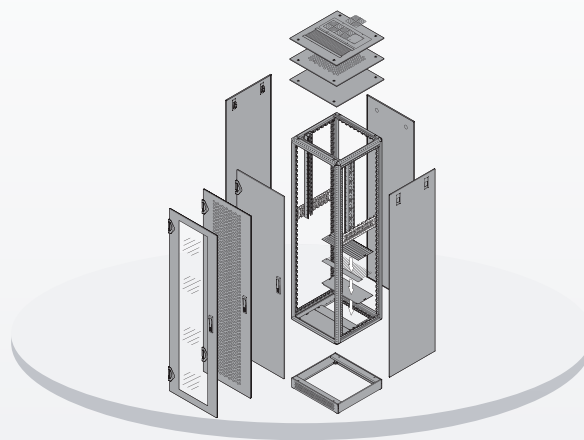


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# ELECTRONICS CABINETS

CUSTOMIZED PROTECTION FOR RELIABLE PERFORMANCE

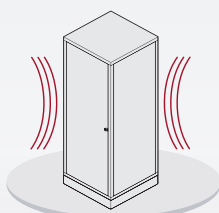
WHEN MISSION CRITICAL COMMUNICATIONS AND ELECTRONIC EQUIPMENT REQUIRE SUPERIOR PROTECTION, YOU CAN RELY ON NVENT SCHROFF ELECTRONICS CABINETS FROM NVENT. WE OFFER SOLUTIONS LIKE ELECTRONIC CABINET, SERVER CABINET, ETC.



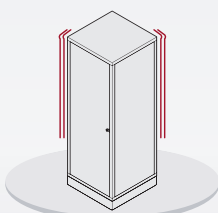
UNSHIELDED

EMC SHIELDED

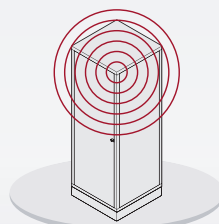
WATER COOLED CABINETS



EARTHQUAKE



SHOCK



EMC

VARISTAR  
DECO, IP 20, IP 55

VARISTAR  
SEISMIC

VARISTAR  
MIL 901

VARISTAR  
EMC

VARISTAR  
EMC/SEISMIC

VARISTAR  
EMC/MIL901

LHX RACK  
INTEGRATED

SHX  
IN ROW





# MIL-CERTIFIED CABINETS

**VARISTAR - AS A VERSATILE CABINET PLATFORM FOR EXTREME CONDITIONS**  
**NOVASTAR - LIGHTWEIGHT AND WITH FLEXIBLE DIMENSIONS**

## UNCOMPROMISINGLY SECURE AND ECONOMICAL

Cost control is a requirement for most projects. COTS solutions are a useful tool to achieve this for military applications. nVent SCHROFF is committed to providing a COTS solution and to providing uncompromising security.

Varistar in steel and Novastar in aluminum are designed to provide 100% reliability for robustness under shock and vibration, shielding against high frequency interference, and ensuring long-term durability. Attention to detail and total reliability down to the smallest detail make the fulfillment of complex security tasks possible - and also economically viable.

## LONG-TERM SERVICE

Varistar and eurorack remain unfazed even in dusty and high humidity conditions. Zinc plating and additional powder coating provide double protection against corrosion.

## BEST-IN-CLASS HF SHIELDING. IP PROTECTION INCLUDED

The Varistar shielding principle protects sensitive data from interference radiation. Best of all, even in the most diverse cabinet configuration, Varistar performs with the highest shielding effectiveness. Tested to IEC 61587-3, the HF gasket simultaneously forms a barrier against dust and water to IP 55.

## SHOCK AND VIBRATION RESISTANCE

In general, cabinets installed on ships are equipped with shock absorbers. Four absorbers are fitted under the cabinet, and two are used for wall mounting on the top. The design requires a calculation that takes the cabinet dimensions and payload into consideration. Shock absorber selection and dimensioning is performed by our specialist partner Socitec. Documentation of standard versions with detailed descriptions and test reports are available at:

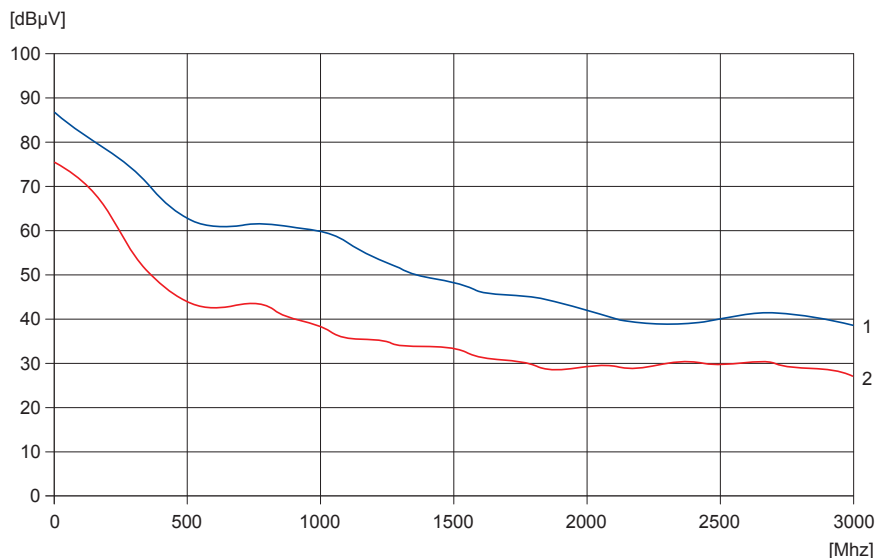
[www.schroff.co.uk/testreports](http://www.schroff.co.uk/testreports)

## VARISTAR EMC TEST RESULTS (TO IEC 61587-3)\*: VARISTAR WITH

- Solid steel door: 60 dB at 1 GHz
- Perforated door: 40 dB at 1 GHz
- Fan top cover: 55 dB at 1 GHz
- Cable entry in base plate: 45 dB at 1 GHz
- Solid steel door: 40 dB at 3 GHz
- Perforated door: 30 dB at 3 GHz
- Standard dimensions of tested object 2000 x 600 x 600 mm



The Heavy-Duty version offers a maximum static load-carrying capacity of 800 kg and withstands dynamic loads up to DL6.



1 Cabinet with solid steel door  
 2 Cabinet with perforated door



More Information  
**Scan Code**

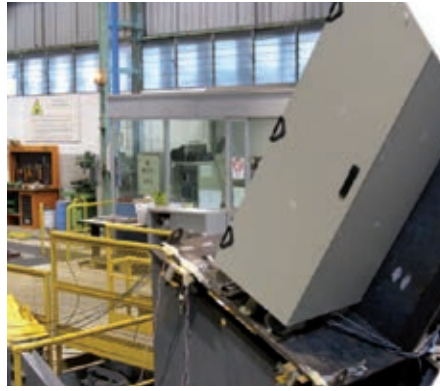
## MIL-CERTIFIED CABINETS

Externally isolated at both base and rear, our VARISTAR and eurorack cabinet platforms have been successful aboard key naval programs. Defense agencies rely on our flexibility and ability to modify our COTS platform to the most demanding environments on the high seas. With our partner Socitec we offer 19" ruggedized cabinets, validated to MIL-S-901D.

The cabinet is derived from our standard COTS platform solutions and combines today's requirements for integration:

- High performance elastomer or cable elastic mountings for COTS equipment
- 19" standard
- Large selection of dimensions (height and depth)
- Great variety of accessories available
- Reduced engineering and fabrication costs
- EMC or HF adaptable
- ROHS compliant

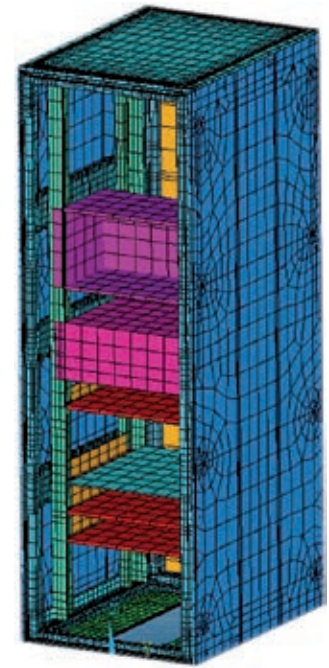
Designed to MIL-STD-901D for shock and MIL-STD-167F for vibration. For specific customer requirements nVent SCHROFF is developing and testing rugged cabinet solutions to further MIL standards such as MIL-STD-810F for environmental conditions.



Cabinet tested to MIL-STD-901D



Versions of shock absorbers



F.E. model - mesh and stress analysis



## BENEFITS AT A GLANCE

Certified:	With Schroff VPX backplane, fully modular design for maximum flexibility
Flexible:	Highly flexible construction for tight spaces
Reliable:	Shielded against high-frequency interference: 60dB at 1 GHz, 40dB at 3GHz
Protected:	Against dust and water (IP 55)
Durable:	Dual protection against corrosion with zinc-plated and powder-coated frame

# TESTING & SIMULATION

## WIDE RANGE OF IN-HOUSE PROCESS CAPABILITIES

### DEVELOPMENT AND DESIGN TO MIL STANDARDS

Our team of experienced development, design and application engineers, modern design tools and high quality project management are the guarantee of our high quality standard. To ensure this remains the case in the future, our engineers are constantly researching many areas including signal integrity, EMC, cooling, shock and vibration resistance, and surface treatment.

### FOR THE OPTIMAL DESIGN WITH MAXIMUM PERFORMANCE

- Latest CAD software, simulation tools, and measuring equipment
- Experienced developers
- Up-to-date layout tools, e.g. Mentor Graphics Board Station and PADS
- 3D files of the layout tools are used in the mechanical design

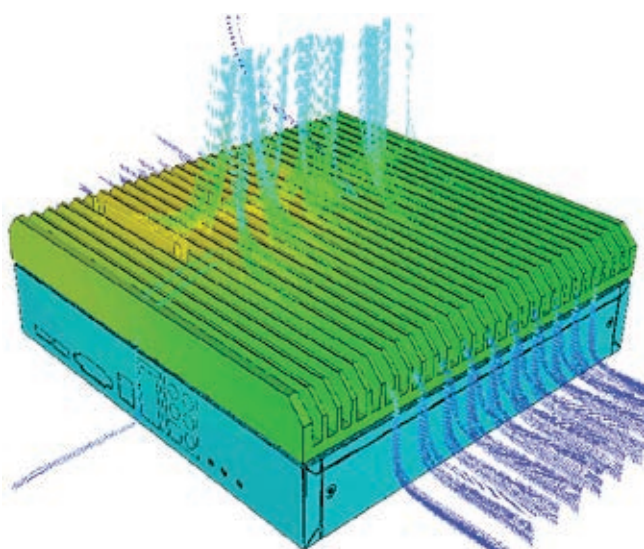
### MODELING, SIMULATION, AND MEASUREMENT: 100% QUALITY

One thing remains top priority at every stage of development: the continuous assurance of 100% quality. Our engineers therefore always use the most up-to-date modeling and simulation tools, measuring instruments and in-house-designed, high-performance test adapters.

In this way we can optimize the development process and ensure, from as early as the layout stage, that we are offering our customer the best and highest-performance products. For more advanced tests we work in cooperation with certified testing and examining institutes.

### FOR A RAPID DEVELOPMENT PROCESS AND HIGH RELIABILITY

- For interference emission and interference immunity: internal and external EMC/CE test location
- Backplane Pre- and Post-layout simulation:
  - HFSS, 3D electromagnetic field solver
  - ADS (Advanced Design System) with
- Momentum 3D Planar EM Simulator
  - MATLAB
  - HyperLynx PI (Power integrity simulation)
- Backplane Signal integrity verification
  - N5227A 67GHz Network Analyzer
  - TDR. 86100B mainframe + 54753A
- Sampling modules
  - PLTS Software
  - Measurement adapter (paddle cards)
- For thermal simulations: 6SigmaET, Flotherm, and Solidworks Simulation
- For thermal tests: wind tunnel, climate cabinet, and custom thermal test benches
- Shock and vibration test
- IP test



# TESTING & SIMULATION

## WIDE RANGE OF IN-HOUSE PROCESS CAPABILITIES

### MODERN MANUFACTURING FACILITIES

Innovative production methods, modern machinery and a high degree of automation guarantee that our product offering assures the consistent high quality and performance characteristics demanded in military and aerospace applications. Optimized for prototypes to production, our customers benefit from further advantages such as time and cost savings.

### MANUFACTURE OF MECHANICAL COMPONENTS

The best processes, assuring flexibility and high quality:

- Cutting
- Power-press punching
- CNC punching
- Routing
- Bending
- Laser processing
- Joining techniques
- Steel and aluminum welding
- Galvanic surfaces for steel and aluminum parts
- Screen or digital printing
- CNC milling
- Aluminum finishing/plating

Machines developed in-house for still higher production efficiency:

- Fully-automated production lines for horizontal rails
- Production facility for threaded inserts
- Highly flexible punching facility for custom front panel manufacture

### MANUFACTURE OF ELECTRONIC COMPONENTS

Economic solutions with the highest precision:

- Solder paste printing
- Automatic SMD placement
- Vapor-phase soldering
- Wave soldering
- Automated press-in operations
- Conformal coating



# QUALITY ASSURANCE

STRIVING FOR 100% RELIABILITY

## MORE THAN A POLICY: A CORE VALUE

nVent SCHROFF is committed to the highest possible standards in military and aerospace. With our high-quality product offering, quality control is a core value. This means that our quality management continuously examines and improves procedures and processes, at every stage of design and manufacturing.

## QUALITY CONTROL

### FMEA

- Looks for potential weaknesses in product or production processes during the design and development phases

### AUTOMATIC OPTICAL INSPECTION

Testing of electronic sub-assemblies for manufacturing defects such as:

- Poorly soldered joints
- Wrongly-placed or missing components

### IN-CIRCUIT TEST

Economic solutions with the highest precision:

- Detects faults in the conductive path such as short circuits or discontinuities
- Isolates soldering errors and component faults
- Circuit block tests

### FUNCTION AND SAFETY TESTING

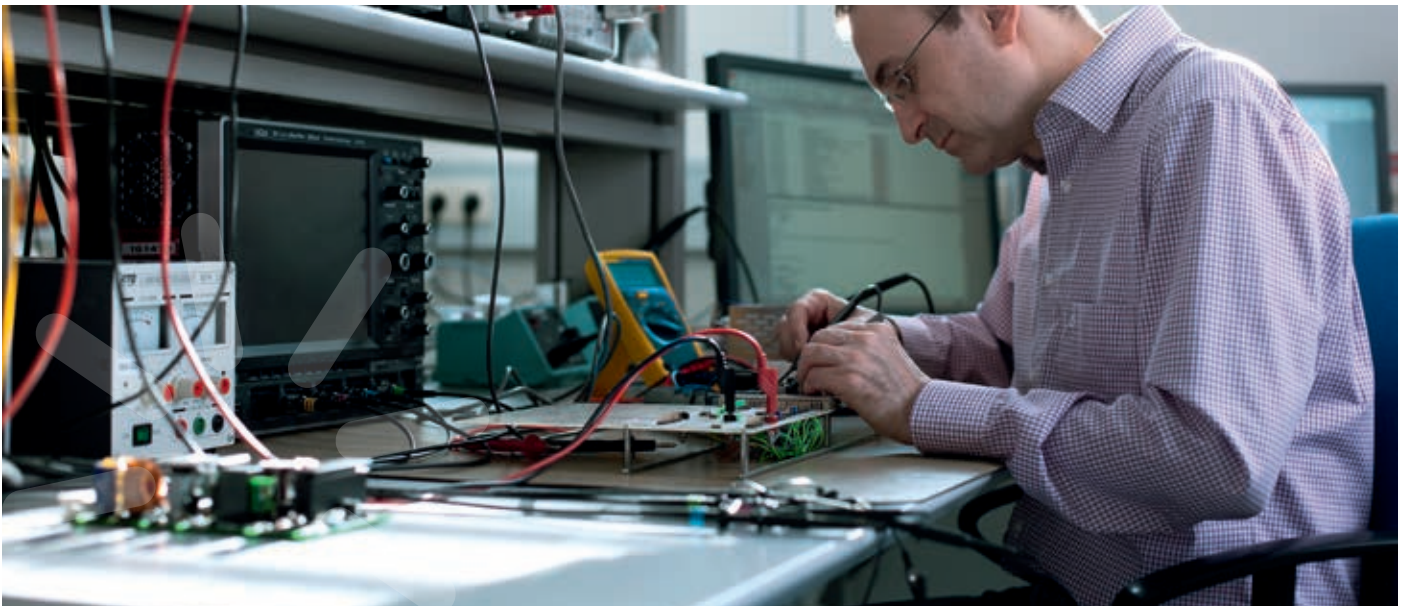
- System functions
- Earthing test
- Insulation test (high-voltage test)

### FATIGUE/BURN-IN TEST

- Fatigue testing of power supply units under operating conditions
- Early-failure detection



nVent SCHROFF is certified to AS9100 and ISO9001 certifications for the Calmark and Birtcher lines of Retainers.



# COMPLIANCE & DOCUMENTATION

## COMPLIANCE FOR LARGE GOVERNMENT PROGRAMS

### OUR BENCHMARK: COMPLETE CUSTOMER CONFIDENCE

Our comprehensive quality promise guarantees prime contractors and their customers compliance with military requirements. As a result of our decades of experience and cutting-edge technology, customers can rest assured that the products they receive fully meet their expectations. What is more, our customers benefit from the highest quality and reliability – simply from a single source.

### WE GUARANTEE PRODUCT PERFORMANCE

Our extensive in-house product testing is unmatched in the industry with UL approved test labs, EMC, CSA/TUV, water and salt spray, UV, and static load testing facilities. During the design phase, we perform extensive DVT (design verification testing) protocols to validate product performance. Through a highly integrated electronic database, we provide complete serial number traceability on all systems, FRUs, key components, and software updates. When you take delivery of your

components, you have our guarantee that they meet or exceed all applicable industry performance standards for repeatable and calibrated results.

### WE GUARANTEE PRODUCT PERFORMANCE

We can provide procured part certification and traceability for U.S. Government programs. As a result of our broad experience in the market, we know and understand Defense Federal Acquisition Regulation Supplement (DFARS) compliance requirements.

nVent SCHROFF has completed the implementation of policies and procedures at its San Diego and Rhode Island facilities to meet the requirements of the Directorate of Defense Trade Controls (DDTC) compliance program for registered manufacturers and exporters of defense articles and services as

defined in the United States Munitions List (USML).

nVent SCHROFF is a truly global partner and as such our locally manufactured solutions from components to systems to cabinets, are uniquely positioned to meet the needs of defense applications. These products are designed in accordance with exacting local and global standards and as such offer the perfect COTS building platform ensuring a guaranteed level of confidence throughout the design and manufacturing cycle. In turn this reduces time and cost to market whilst keeping the highest

quality and accordance with requirement specifications.



# GLOBAL REACH

WE SERVE LOCAL AND MULTI-NATIONAL COMPANIES WITH SALES OFFICES AND MANUFACTURING LOCATIONS AROUND THE WORLD



## EUROPE

**Straubenhardt, Germany**  
Tel: +49.7082.794.0

**Betschdorf, France**  
Tel: +33.3.88.90.64.90

**Warsaw, Poland**  
Tel: +48.22.209.98.35

**Assago, Italy**  
Tel: +39.02.932.714.1

## NORTH AMERICA

**All locations**  
Tel: +1.800.525.4682

## MIDDLE EAST & INDIA

**Dubai, United Arab Emirates**  
Tel: +971.50.55.19823

**Bangalore, India**  
Tel: +91.80.6715.8900

**Istanbul, Turkey**  
Tel: +90.545.284.0908

## ASIA

**Shanghai, P.R. China**  
Tel: +86.21.2412.6943

**Qingdao, China**  
Tel: +86.523.8771.6101

**Singapore**  
Tel: +65.6768.5800

**Shin-Yokohama, Japan**  
Tel: +81.45.476.0271

Our powerful portfolio of brands:

**CADDY ERICO HOFFMAN RAYCHEM SCHROFF TRACER**



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SCHROFF-SB-H81327-DefenseAerospace-EN-2008