



**CONNECT AND PROTECT**

# Railway Certified Subracks, Cabinets and Enclosures

Electronics Packaging for KAVACH

  
nvent

**SCHROFF**

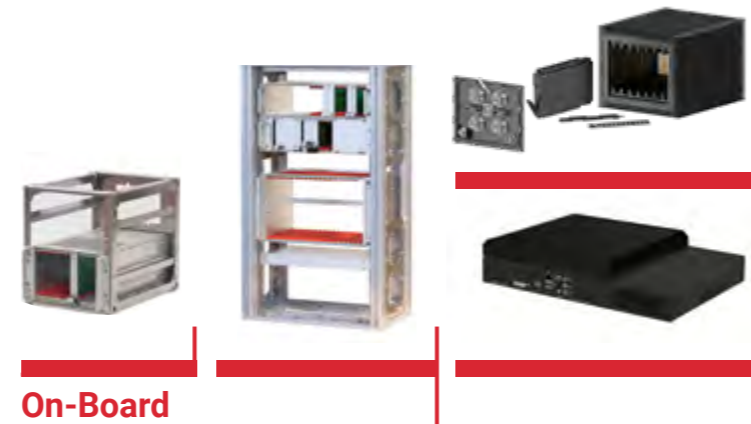




## Shaping the Future of Mobility

### DIGITALIZATION, AUTOMATION AND INTERNET OF TRAINS

Railway communication equipment and systems are the foundation of railway signaling and communication. nVent SCHROFF supports digitalization and IoT by providing essential system platforms, including small form factor cases and Embedded COM systems, as well as a range of enclosure and integration solutions that connect and protect sensitive electronics and infrastructure.



On-Board

## Ensuring Efficiency, Reliability and Safety.

### NEXT-GENERATION RAILWAY SYSTEMS

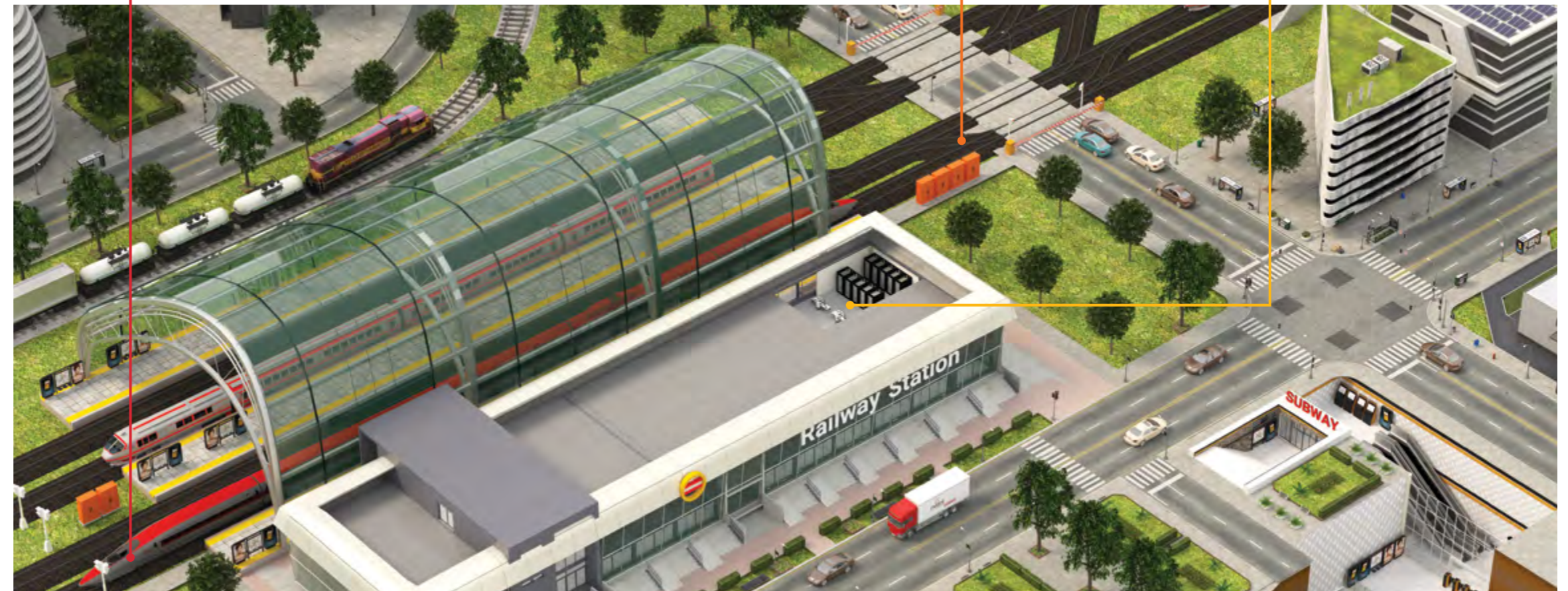
Implementing next-generation railway systems, such as communication based train control (CBTC) and 5G, require integrating advanced hardware and systems into new and existing equipment.

With many products specifically designed and certified for the railway and transportation industry, nVent offers solutions for indoor, on-board and outdoor trackside signaling and telecommunications equipment.



Trackside

Technical Room



nVent offers a comprehensive range of niche electrical solutions that are critical to railway networks. With our powerful portfolio of brands that includes nVent ERICO, ERIFLEX, HOFFMAN, RAYCHEM and SCHROFF, railways throughout the world have come to rely on our expertise, and high quality products that meet strict global rail standards such as AREMA and CENELEC.

Our wide ranging portfolio includes electrical protection for rail infrastructure and equipment, connection solutions for trackside and on-board electrical infrastructure, enclosures for all types of railway signaling applications, and heating solutions that help railways operate in harsh winter conditions. Together, nVent makes an important contribution to safer, more reliable railway networks.

At nVent, we believe that safer systems make the world a safer place. We connect and protect our customers with innovative solutions.



PROTECTED AGAINST ENVIRONMENTAL CONDITIONS



SECURITY & INTRUSION PREVENTION



SCALABILITY & FLEXIBILITY



OPTIMAL THERMAL PERFORMANCE



ON-BOARD AND TRACKSIDE



RAILWAY CERTIFICATIONS



GLOBAL AVAILABILITY & SUPPORT



# Robust On-Board Solutions

For a precise and highly repeatable operation.

## EUROPACPRO SUBRACK

nVent SCHROFF's EuropacPRO 19" subracks are easily configured and designed to house and protect your electronic equipment. With a modular platform and a wide range of standard, modified and also customized solutions, EuropacPRO subracks are ideal for a variety of requirements ranging from cost-saving up to ruggedized shock and vibration resistant options.

- Shock, vibration and environmental resistance per EN 50155, NF F 60-002
- Fire safety compliance for components meeting UL-VO and EN 45545-2, R22, R23 and R24 HL3
- EMC shielding per IEC 61587 DL 3 with stainless steel or textile gaskets
- Modular subrack with a wide portfolio of compatible standard components
- Broad portfolio of compatible front panels, plug-in units, handles and accessories



Standard EuropacPRO Subrack



Custom EuropacPRO Subrack

# Overcoming Spatial Limitations

Ensuring accessibility to electronics without obstruction.

## ON-BOARD RACKS

Innovative On-Board Racks (OBR) from nVent SCHROFF bring space-saving efficiency to on-board electronics and can also reduce transportation costs.

- Suitable for 1, 2, or 3 U SNCF subracks (NF F61-005, CF 60-002)
- Suitable for ongoing vibrations, shock, high temperatures, and high humidity
- Height 3, 6, and 9 U, width 36 and 84 HP, depth 341.8 mm
- Welded to EN 15085 (CL2) and AWS standards
- Rear side is equipped for standard connectors; crossbar can be custom-coded for the SNCF coding pins



Lightweight OBR with a welded frame



Vehicle OBR with a bolted aluminum frame

## DIGITAL EMPOWERMENT FASTER RESULTS

Check out our Online Configurators



- Intuitive Design with a 3D drag and drop functionality



- Automated error checking logic
- Free instant CAD and BOM documentation

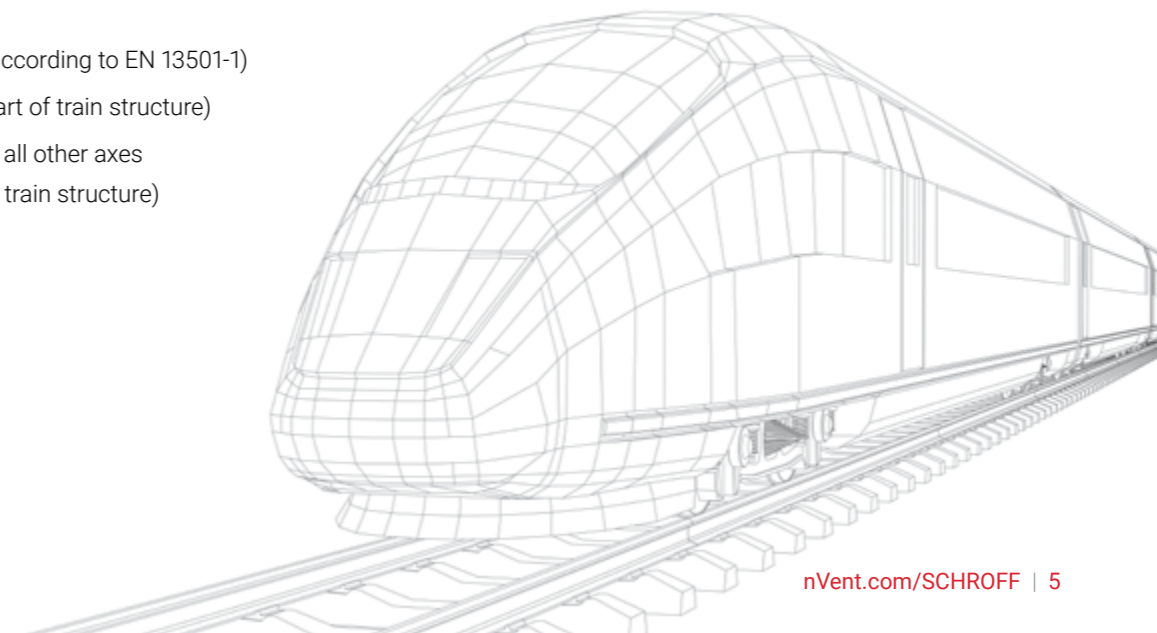
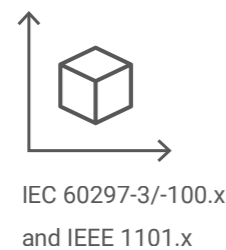


- Instant price and 24/7 stock availability [bit.ly/3XfEDgv](http://bit.ly/3XfEDgv)

## VEHICLE ON-BOARD COMPUTER FOR SIGNALING APPLICATIONS

The VOBC by nVent SCHROFF is unique, because it is bolted together instead of being welded. The bolted design provides a compact solution that can be shipped via flat pack saving on shipping and storage costs globally. The rack can then be assembled on site, making the installation easier and faster on the train in confined spaces.

- AREMA 11.5.1 for equipment class 1
- CENELEC EN 61373 (Category 1, Class A-B)
- EN 15085 (CL2)
- EN 45545 (Product Class A1 according to EN 13501-1)
- Shock: 5 g in all axes (when part of train structure)
- Shock: 5 g in one axes / 3 g in all other axes (when not fully integrated into train structure)






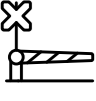

# Resilient Signaling & Track Control

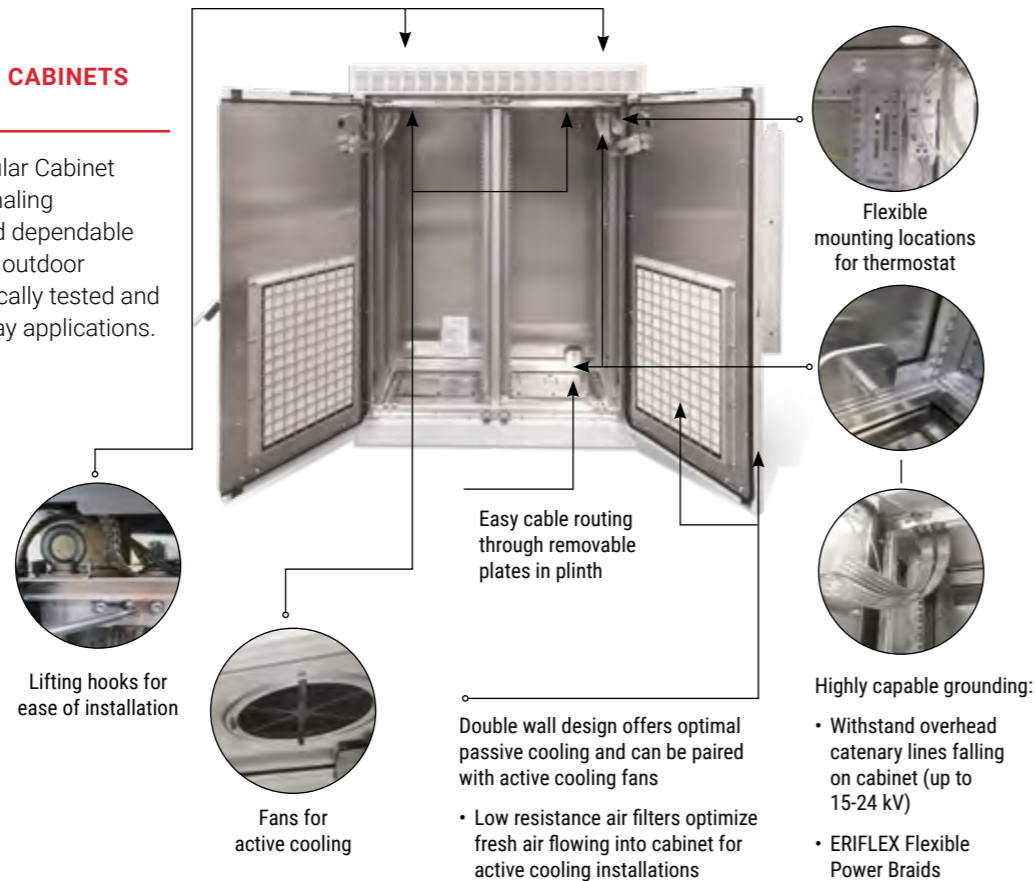
Optimized for predictive maintenance.

## DB CERTIFIED 19" ELECTRONICS CABINETS FOR OUTDOOR TRACKSIDE

The nVent SCHROFF Outdoor Modular Cabinet supports 19" modern electronic signaling equipment and ensures smooth and dependable operation of sensitive electronics in outdoor trackside environments. It is specifically tested and certified for outdoor trackside railway applications.



-  Digital Interlocking
-  Level Crossings
-  Axle Counting



# Certified for Railway Telecoms

Supporting real-time communications.

## OUTDOOR MODULAR TELECOMMUNICATION CABINET

The nVent SCHROFF Outdoor Modular Cabinet platform helps Telecom industry leaders deploy best-in-class fixed line broadband projects (FTTC to FTTH), Wireless Network projects (WLAN's to WWAN's) and Mobile Communications Network projects (4G-LTE and 5G).

- Double wall design
- Vandalism, corrosion and graffiti proof
- Advanced thermal management with active and passive cooling
- RC0 or RC2 as standard, RC3 or RC4 certified upon request
- Patented door hinges for high stiffness
- Steel or aluminium cladding
- Easy maintenance and replacements
- Multiple cable entry options
- Level 3 integration
- High grade locking with vandalism proof handles
- Available with ERICO Modular Lightning Protection kit



## Resilient and highly functional

- EN 1991: Withstand pressure drop of passing train (350km/hr), reinforcements for snow load
- Ril 997.0205A01: Grounding protection against fallen overhead catenary lines
- EN 60695: Fire hazard / thermal stress, powder coat paint according to EN45545
- IEC 61969-3 and EN 50125-3 for protection against environmental conditions
- EN 50125-3 for shock and vibration (1-3 m from the rail)
- EN 60529 for ingress protection up to IP55
- IEC 61587-2 and IEC 61969-3 for Seismic Belcore Zone 4
- EN 50125-3 for wind resistance (180 km/h)
- EN 1627 and EN 1630 for vandalism protection
- EN 50121 for electromagnetic compatibility
- IEC 61969-2 for coordination dimensions
- IEC 60068-2-75, IEC 62262 and IK 10 for impact/hammer test





# Station Control & Train Monitoring

Vibration and shock resistant.



## MULTI-PURPOSE ELECTRONICS CABINETS

nVent SCHROFF offers steel and aluminum frame cabinet platforms with a wide range of dimensions and cover parts. Choose from different IP / NEMA protection levels, as well as options such as perforated doors, fan units and air-to-water heat exchangers. A RFI shielding option for up to 60 dB at 1 GHz / 40 dB at 3 GHz or earthquake resistance up to Bellcore Zone 4 is also available to withstand extreme environments while meeting the strictest safety requirements.

## VARISTAR EMC – INDOOR ELECTRONICS PROTECTION

The nVent SCHROFF Varistar CP EMC is one of the very few electronic cabinets which has been tested successfully according to **EN 61000-5-7 up to 18 GHz** in addition to **IEC 61587-3** and offers best-in-class shielding protection: Attenuation of 40 dB at 3 GHz and 30 dB at 10 GHz with a solid door.

The nVent SCHROFF Varistar CP EMC cabinet has a robust, welded, heavy-duty frame and is specifically tested and certified for railway trackside indoor applications:

- IEC 61 587-1 for robust mechanical structure and physical performance
- EN 61000-5-7 and IEC 61587-3 for advanced EMC shielding up to 18 GHz
- IEC 60529 for ingress protection up to IP55
- EN 45545-2 for Low Smoke Zero Halogen compliance
- CENELEC EN 50125-3 certification for smooth performance against shock and vibration for trackside use (1-3 m from the track)
- AREMA 11.5.1 class C (designed to meet US railway standards for trackside use in bungalows)



UL2416



DL5 as per IEC 61 587-1



EN61000-5-7  
IEC 61587-3



IEC 60529



EN 45545-2



IEC 61587-2  
IEC61969-3



Advanced security



Intelligent Power Distribution

# Electronics Packaging for KAVACH

We accompany you - for the entire life of the product.



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## Global Availability and Local Support

nVent SCHROFF Global Manufacturing Locations.



# Enclosures for TCAS

Station / Trackside – UHF Radio Communications – On-Board



## Station / Trackside

- Stationary TCAS Control Unit
- Interlocking System
- Intermediate Block Signaling

## On-Board

- Stationary TCAS Control Unit
- Interlocking System
- Intermediate Block Signaling

## UHF Radio Communication

# We Connect and Protect

We accompany you - for the entire life of the product.

### ABOUT NVENT

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.

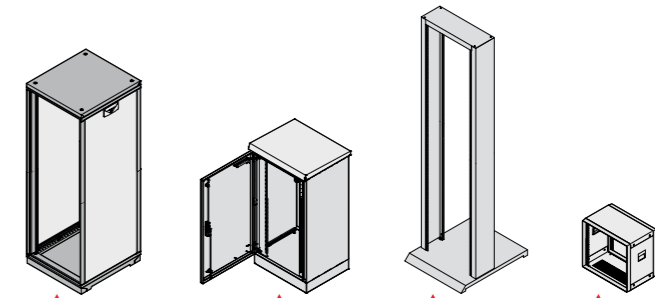
### ABOUT NVENT SCHROFF

The SCHROFF brand is nestled within the Enclosures business segment of nVent. 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.

### READY TO SUPPORT KAVACH

To effectively increase capacity and ensure safety over high speed and high density rail networks of Indian Railways, rail certified enclosures are needed for the Automatic Train Protection (ATP) system including Train Collision Avoidance System (TCAS). nVent SCHROFF stands ready with on-board and trackside enclosures that are rail certified and ideal for TCAS systems.

### CABINETS



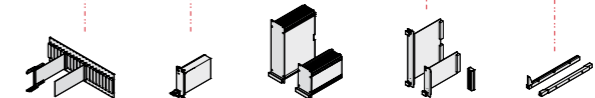
### SYSTEMS



### SUBRACKS AND CASES

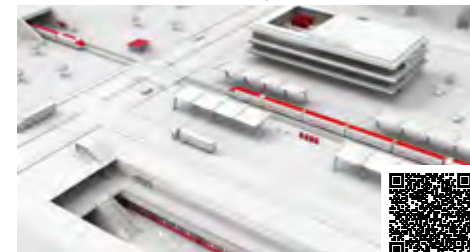


### BACKPLANES, FRONT PANELS, POWER SUPPLY UNITS, PCB RETAINERS AND ACCESSORIES



### RESOURCES

nVent SCHROFF Railway Solutions



Product Configurators



Brochures, Certifications, and Case Studies



### NVENT SCHROFF PROTECTS ELECTRONICS: IN 19" AND BEYOND.

As one of the leading innovators in 19", nVent is expanding its product range to other small form factor solutions beyond the classic 19" technology. nVent's SCHROFF branded Interscale product family reduces integration time with its innovative case design and accessories, and can be tailored to meet individual requirements. It's our way of offering flexibility for small and non-standard PCBs, and to deliver exactly what you need, when you need it.

### STANDARDIZATION

Since 1978, we have been actively involved with standardization committees pertaining to mechanical, electrical and communication interfaces for electronics equipment.

Our powerful portfolio of brands:

**CADDY ERICO HOFFMAN RAYCHEM SCHROFF TRACER**



[nVent.com/SCHROFF](https://nVent.com/SCHROFF)