



Overview

Edition  
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RUGGED NETWORK COMPONENTS

**RUGGEDCOM**

Products at a Glance

[siemens.com/ruggedcom](https://www.siemens.com/ruggedcom)

**SIEMENS**

RUGGEDCOM products provide a level of robustness and reliability that has set the standard for communication networks deployed in harsh environments.

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## RUGGEDCOM product family

RUGGEDCOM products are part of the industrial communication networks portfolio. They offer reliable operation across a wide temperature range, Zero-Packet-Loss technology for immunity to high levels of electromagnetic interference as well as enhanced Rapid Spanning Tree Protocol (eRSTP™) for ultra high-speed network fault recovery. Select models also support IEEE 1588 v2 time synchronization as well as High availability Seamless Redundancy Protocol and Parallel Redundancy Protocol (HSR/PRP) for network redundancy.

Backed by a 5-year warranty and comprehensive technical support, they offer a wide variety of hardware and software solutions for various industrial installations. RUGGEDCOM products are used in mission critical and real-time control applications found in industries such as electric power, transportation, and oil & gas.

# Rugged rated

RUGGEDCOM products have been specifically designed and tested to withstand harsh environments.

## FEATURES

### Ethernet ports

- Multiple port types supported (copper, fiber – including multimode, singlemode, bi-directional)
- Long haul optics that allow connectivity for distances over 100 km

### Reliable operation in harsh industrial environments

- IEC 61850-3 and IEEE 1613 (electric power)
- IEC 61000-6-2 (generic industrial)
- NEMA TS-2 (traffic control equipment)
- EN 50121-4 (railway)
- EN 50155 (on-board rail vehicles)
- ATEX, IEC Ex, HazLoc Class 1 Div 2 (for explosive atmospheres), ABS (Marine) – select models

### Error-free operation in high EMI (Electromagnetic Interference) environments

- Zero-Packet-Loss technology for fiber-optic networking devices
- IEEE 1613 Class 1 with copper ports or Class 2 with all fiber-optic ports for error-free performance under EMI stress
- Conformal coated printed circuit boards as option for extra environmental protection

### Operation over a wide temperature range

- -40 °C to +85 °C operating temperature
- Passive cooling – no fans

### High availability

- Integrated single or redundant power supplies
- Dual power supplies can be powered independently from different input voltages
- Universal high-voltage range: 88–300 V DC or 85–264 V AC
- Low voltage power supplies
- CSA/UL 62368 safety approved to +85 °C

### Industrial installations

- Metal enclosure
- Heavy duty mounting
- Industrial terminal blocks for power and I/O connections



### HALT – Eliminate weaknesses in design

Highly Accelerated Life Testing (HALT) subjects design prototypes to vibration and ambient temperatures far beyond their normal operation range. HALT results are used to verify and improve the product designs.

### HASS – Remove manufacturing errors

Highly Accelerated Stress Screening (HASS) subjects RUGGEDCOM products to tougher conditions than they will encounter in the field. This ensures that customers get their orders free of manufacturing errors and random defects.

### THSS – Enhance product reliability

Humidity is an essential environmental parameter that is analyzed to further improve product reliability. The Temperature and Humidity Stress Screening (THSS) test is performed inside a humidity chamber that exposes RUGGEDCOM products to water vapor. Data collected is then analyzed to ensure RUGGEDCOM products perform beyond industry standards.

# Ethernet layer 3 switches and routers

RUGGEDCOM Multi-Service Platforms are integrated layer 2 and layer 3 switches, designed for use in high performance industrial networks. They are modular in design and support numerous IT & OT applications, such as switching, routing, serial, 4G cellular, T1/E1, IoT edge applications, and stateful firewall.



## RUGGEDCOM RX1500

Rack-mount layer 2 or layer 3 switch & router

- Modular redundant power supplies
- Supports up to 4 line modules including WAN and cellular 4G modules
- Supports RUGGEDCOM APE
- Marine certification: ABS



## RUGGEDCOM RX1501

Rack-mount layer 2 or layer 3 switch & router

- Modular single power supply
- Supports up to 6 line modules including WAN and cellular 4G modules
- Supports RUGGEDCOM APE



## RUGGEDCOM RX1510

Compact layer 2 or layer 3 switch & router

- Modular redundant power supplies
- Supports up to 4 line modules including WAN and cellular 4G modules
- Supports RUGGEDCOM APE



## RUGGEDCOM RX1511

Compact layer 2 or layer 3 switch & router

- Modular single power supply
- Supports up to 2 line modules including WAN and cellular 4G modules
- Supports RUGGEDCOM APE



## RUGGEDCOM RX1512

Compact layer 2 or layer 3 switch & router

- Internal wide-range DC power supply
- Supports up to 2 line modules



## RUGGEDCOM RX1524 New

Rack-mount layer 3 switch & router

- Modular redundant power supplies
- Supports up to 4 line modules including cellular 4G modules
- Supports RUGGEDCOM APE



## RUGGEDCOM RX1536 New

Rack-mount layer 3 switch & router

- Modular single power supply
- Supports up to 6 line modules including cellular 4G modules
- Supports RUGGEDCOM APE



## RUGGEDCOM APE1808

Utility-grade Application Processing Engine, line module for the RX1500 family

- 2 x physically separate Gigabit Ethernet interfaces
- 2 x USB 3.0 and 1 x Intel HD 500 display port
- Based on Windows 10 or Linux OS
- Used for deploying Siemens and third party applications, e.g., for cybersecurity, Edge computing, secure access management, and more.



## RUGGEDCOM RX5000

High port density layer 2 or layer 3 switch & router

- 2 x 10GBASE-X SFP+ uplinks
- Support for up to 98 ports
- Modular redundant power supplies
- Supports up to 6 line modules

# Cellular routers

RUGGEDCOM's 4G LTE cellular routers provide high bandwidth and reliable remote data communication over long distances.



## RUGGEDCOM RM1224

4G router and integrated 4-port Fast Ethernet switch

- One digital input and one digital output
- 2 x SMA ports for Wireless WAN interface (4G/3G/2G) with up to 100 Mbit/s downlink and 50 Mbit/s uplink
- 4 x 10/100BASE-TX
- C-/KEY-PLUG slot for configuration storage
- -40 °C to +70 °C operating temperature



## RUGGEDCOM RX1400

Multi-protocol intelligent node

- Integrated isolated power supply
- 4 x 10/100BASE-TX, 2 x 1000BASE-X SFP
- 2 x RS485/RS422/RS232 serial ports
- Optional 4G LTE cellular modem
- Dual micro-SIM support for carrier redundancy
- Optional 2 x R-SMA interface for Wireless LAN 802.11 a/b/g/n interface (Access Point/ Client)
- GPS input for location data
- MicroSD slot for configuration or application storage
- Optional virtual machine environment

## ROX-II (operating system) common features

### Cybersecurity

- Integrated firewall, IPsec and tunneling agents
- VPN with 3DES, AES128, AES256 support
- IPv6 firewall
- IPv6 tunneling
- RADIUS, TACACS+ authentication
- Multi-level user access management
- SSH/SSL (128/256-bit encryption)
- Enable/disable ports, MAC-based port security
- Port-based network access control (802.1x)
- VLAN (802.1Q) to segregate and secure network traffic
- SNMPv3 encryption, integrity, and authentication

### Routing

- VRRP, OSPF, RIPV2, BGP, IS-IS
- DHCP agent (Option 82 capable)
- Traffic prioritization, NTP server
- IP multicast routing, IGMPv3
- Protocol-Independent Multicasting (PIM) and PIM-SSM (Source Specific Multicast)
- DMVPN
- Dynamic L2TPv3 and GRE
- NetFlow
- VRF, VRF Lite
- MPLS
- R-GOOSE and R-SMV (Routable GOOSE and Routable SMV support)

### Switching

- MSTP 802.1Q-2005
- RSTP (802.1w) and enhanced Rapid Spanning Tree (eRSTP) network fault recovery (<5 ms)
- Quality of Service (802.1p) for real-time traffic
- VLAN (802.1Q) support
- Link aggregation
- Traffic prioritization
- Transaction-based configuration with rollback
- GMRP and GVRP support
- MRP (Media Redundancy Protocol)

### WAN

- Frame Relay RFC 1490 or RFC 1294
- PPP, PAP, CHAP authentication
- IEC 61850 GOOSE messaging support



# 19" Rack-mount Ethernet layer 2 switches

RUGGEDCOM's 1U rack form factor layer 2 switches deliver utility-grade performance, reliability, and field-proven high MTBFs that lowers operating expenses over the lifetime of the products. They are designed to be field-modular, with variants that support IEEE 1588 v2 time synchronization, IEC 62439-3 (HSR/PRP) and Power over Ethernet (PoE), that makes it easy to customize these devices as per network requirements.



## **RUGGEDCOM RSG2100** 19-port modular managed Ethernet switch with Gigabit uplinks

- 3 x 1000BASE-X + 16 x 10/100BASE-X
- Hazardous location certification: Class 1 Div 2 and ATEX
- Marine certification: ABS



## **RUGGEDCOM RSG2100P** 19-port modular managed PoE enabled switch with Gigabit uplinks

- 3 x 1000BASE-X + 16 x 10/100BASE-X
- Hazardous location certification: Class 1 Div 2
- Optional 4 x 10/100BASE-TX IEEE 802.3af compliant PoE



## **RUGGEDCOM RSG2200** 9-port managed Gigabit Ethernet switch

- 1000BASE-X and/or 10/100/1000BASE-T
- Hazardous location certification: Class 1 Div 2
- Marine certification: ABS



## **RUGGEDCOM RST2228** 28-port high density managed field modular IEEE 1588 switch with 10 Gbps uplinks

- 4 x 10 Gbps SFP+ uplinks, 4 x 1G BASE-X/1000BASE-X SFP+
- Up to 24 x 10/100/1000BASE-X ports
- Field-modular line modules for added flexibility
- IEEE 1588 v2 Transparent Clock (TC) with hardware time stamping
- RNA module for HSR/PRP support (IEC 62439-3)



## **RUGGEDCOM RST2228P** PoE variant of the RUGGEDCOM RST2228

- Up to 24 x 10/100/1000BASE-X IEEE 802.3af/at/bt compliant (up to 60 W/port) PoE ports
- Shared PoE power budget of 500 W across all PoE line modules



# Compact Ethernet layer 2 switches

RUGGEDCOM compact switches are designed for tight spaces and come with a full array of intelligent functionalities for reliable operation in harsh industrial environments.



## RUGGEDCOM RSG2300

32-port managed Ethernet switch with Gigabit uplinks

- 24 x 10/100BASE-TX + 8 x 10/100BASE-X or 4 x 100/1000BASE-X and 4 x 10/100BASE-X
- Hazardous location certification: Class 1 Div 2
- Marine certification: ABS



## RUGGEDCOM RSG2300P

32-port managed PoE enabled switch with Gigabit uplinks

- 24 x 10/100BASE-TX + 8 x 10/100BASE-X or 4 x 100/1000BASE-X and 4 x 10/100BASE-X
- Hazardous location certification: Class 1 Div 2
- Optional 4 x 10/100BASE-TX IEEE 802.3af compliant PoE ports



## RUGGEDCOM RSG2488

28-port advanced utility-grade, high density managed IEEE 1588 Gigabit Ethernet switch

- Field-replaceable Ethernet modules
- Hot-swappable power supplies
- 28 x 1000BASE-X non-blocking architecture
- IEEE 1588 v2 hardware time stamping
- PTP module support to serve as Grand Master Clock for downstream assets and for time conversion across IEEE 1588, SNTP, IRIG-B, and GPS formats
- Marine certification: ABS



## RUGGEDCOM RS900

9-port managed Ethernet switch with fiber uplinks

- 6 x 10/100BASE-TX + 3 x 100BASE-FX
- Hazardous location certification: Class 1 Div 2



## RUGGEDCOM RS900G

10-port managed Ethernet switch with Gigabit uplinks

- 8 x 10/100BASE-TX + 2 x 1000BASE-X
- Railway application certification: EN 50121-4
- Hazardous location certification: Class 1 Div 2
- Marine certification: ABS



## RUGGEDCOM RS900GP

10-port managed PoE switch with Gigabit uplinks

- 8 x 10/100BASE-TX IEEE 802.3af/at compliant ports
- Up to 2 x 10/100/1000BASE-T or 2 x 100/1000BASE-X



## RUGGEDCOM RSG907R

7-port managed Gigabit IEEE 1588 compatible RedBox and Ethernet switch supporting HSR and PRP

- 3 x 1000BASE-X RNA (Redundant Network Access) SFP Ethernet ports with coupler according to IEC 62439-3
- 4 x 100BASE-FX VDAN (Virtual Dual Attached Node) LC fiber optic ports
- IEEE 1588 v2 Ordinary & Transparent Clocks



reddot award 2018  
winner industrial design



## RUGGEDCOM RSG908C

8-port managed Gigabit IEEE 1588 compatible Ethernet switch

- 4 x 1000BASE-X SFP uplink Ethernet ports
- 4 x 1000BASE-FX LC fiber optic ports
- IEEE 1588 v2 Ordinary & Transparent Clocks



reddot award 2018  
winner industrial design



### RUGGEDCOM RSG909R

9-port managed IEEE 1588 compatible RedBox and Gigabit Ethernet switch supporting HSR and PRP

- 3 x 1000BASE-X RNA and coupler SFP Ethernet ports according to IEC 62439-3
- 6 x 10/100/1000BASE-TX V DAN RJ45 copper Ethernet ports
- IEEE 1588 v2 Ordinary & Transparent Clocks



### RUGGEDCOM RSG910C

10-port managed Gigabit IEEE 1588 compatible Ethernet switch

- 4 x 1000BASE-X SFP uplink Ethernet ports
- 6 x 10/100/1000BASE-TX RJ45 copper Ethernet ports
- IEEE 1588 v2 Ordinary & Transparent Clocks



### RUGGEDCOM RST916P New

16-port managed 10 Gigabit PoE switch

- 12 x 10/100/1000BASE-T RJ45 ports
- 4 x 1G BASE-X/1000BASE-X SFP+
- 10 x 10/100/1000BASE-T IEE 802.3bt Types 1, 2, and 3 compliant PoE ports (60 W/port)
- IEEE 1588 v2 Transparent Clock
- Removable storage medium, CLP, for device configuration back-up



### RUGGEDCOM RST916C New

16-port managed 10 Gigabit IEEE 1588 compatible Ethernet switch

- 12 x 10/100/1000BASE-T RJ45 ports
- 4 x 1G/10G BASE-X/1000BASE-X SFP+
- IEEE 1588 v2 Transparent Clock
- Removable storage medium, CLP, for device configuration back-up



### RUGGEDCOM RSG920P

20-port managed Gigabit PoE switch

- 12 x 10/100/1000BASE-T + 4 x 100/1000BASE-X SFP + 4 x 10/100/1000BASE-T PoE (IEEE 802.3af/at)
- Powers up to 4 PoE enabled devices when used with the RPS1300 power supply
- Micro SD card for configuration storage and firmware upgrade



### RUGGEDCOM RS940G

8-port managed Gigabit Ethernet switch

- 6 x 10/100/1000BASE-T + optional 2 x 1000BASE-X
- Hazardous location certification: Class 1 Div 2



### RUGGEDCOM i800 product family

Unmanaged/managed Ethernet switches

- Four models to choose from with up to 8 x 10/100BASE-TX and up to 3 x fiber ports
- -20 °C to + 60 °C operating temperature (-40 °C to + 85 °C optional)
- i800: 8 x 10/100BASE-TX
- i801: 8 x 10/100BASE-TX + 1 x 1000BASE-LX or 1 x 10/100/1000BASE-T
- i802: 6 x 10/100BASE-TX + 1 x 100BASE-FX or 2 x 100BASE-FX or 2 x 1000BASE-LX
- i803: 4 x 10/100BASE-TX + 1 x 100BASE-FX + 2 x 1000BASE-LX or 2 x 100BASE-FX



### RUGGEDCOM RS8000 family

8-port managed/unmanaged Ethernet switch

- -40 °C to + 85 °C operating temperature
- Fiber optical connectors: MTRJ, LC, ST
- RS8000:** 8 x 100BASE-FX
- RS8000T:** 6 x 10/100BASE-TX + 2 x 100BASE-FX
- RS8000H:** 4 x 10/100BASE-TX + 4 x 100BASE-FX
- RS8000A:** 2 x 10/100BASE-TX + 2 x 10BASE-FL + 4 x 100BASE-FX

## Compact EoVDSL2 switches

RUGGEDCOM compact form factor Ethernet switches with EoVDSL2 uplinks provide the flexibility to use legacy copper or optical infrastructure in harsh environments.



### RUGGEDCOM RSL910

Compact Ethernet switch with EoVDSL2 uplinks

- 2 x 100/1000BASE-X SFP uplink ports
- 6 x 10/100BASE-TX device ports
- 2 x EoVDSL2 uplink ports with terminal blocks
- Integrated 24 V DC, 48 V DC, or HI voltage power supply



## ROS (operating system) common features

### Cybersecurity

- Multi-level user passwords
- Secure File Transfer Protocol (SFTP)
- Web-based management using SSL
- SSH public/private key
- RADIUS and TACACS+ authentication service for device management
- IEEE 802.1X port-based Network Access Control with PEAP (Protected Extensible Authentication Protocol) and EAP-TLS
- Port rate limiting
- Broadcast storm limiting
- Quarantine and Guest VLAN

### Switching

- RSTP (IEEE 802.1D-2004), eRSTP™ (Enhanced Rapid Spanning Tree)
- MSTP (IEEE 802.1Q-2005) and MRP (IEC 62439-2) (ROX v5.x)
- QoS (Quality of Service) IEEE 802.1p
- Class of Services (CoS) and DSCP (Differentiated Services)
- VLAN (IEEE 802.1Q) and double VLAN-tagging (QinQ)
- Link aggregation (IEEE 802.3ad), Link Layer Discovery Protocol (LLDP) IEEE 802.11AB
- IGMPv1, IGMPv2, IGMPv3 snooping for multicast filtering
- GMRP, GVRP
- Port mirroring, port configuration, status, and statistics
- NTP, SNTP
- DHCP Snooping and DHCP Relay (Option 82)

### Additional features supported on select models

- HSR/PRP redundancy protocols (IEC 62439-3)
- IEEE 1588 v2 time synchronization
- Static layer 3 IP switching
- MMS Bridge Object Model according to IEC 61850

## Serial device servers

RUGGEDCOM serial device servers are designed to increase ROI of legacy serial devices, reduce serial cabling costs, and provide remote accessibility to lower management costs.



### RUGGEDCOM RS400

4-port serial device server with integrated 4-port managed Ethernet switch

- 4 x RS485 / RS422 / RS232 serial ports (DB9, RJ45, or screw terminals)
- Ethernet ports: 4 x 10/100BASE-TX



### RUGGEDCOM RS401

Compact 4-port serial device server with integrated 4-port managed Ethernet switch

- 4 x RS485/RS422/RS232 serial ports (DB9, RJ45, or screw terminals)
- Ethernet ports: 4 x 10/100BASE-TX



### RUGGEDCOM RS416

16-port serial device server with integrated 4-port managed Ethernet switch and IEEE 1588 v2 to IRIG-B conversion

- Up to 16 serial ports: RS485/RS422/RS232 via DB9/RJ45 or fiber serial interface via ST
- Ethernet ports: 4 x 10/100BASE-TX
- Optional dual redundant power supplies



### RUGGEDCOM RS910

2-port serial device server with integrated 3-port managed Ethernet switch

- 2 x serial ports (RS485/RS422/RS232 via DB9, RJ45 or fiber-serial interface via ST)
- Ethernet ports: 3 x 10/100BASE-X



### RUGGEDCOM RMC30

2-port serial-to-Ethernet server

- RS232/RS422/485 serial to IP conversion
- Ethernet port: 1 x 10BASE-TX

### Serial device servers common features

- Support for Modbus RTU, IEC 60870-5-103, TCP, Raw Socket, DNP3, TIN serial protocols, SEL MirroredBits, and MicroLok
- Allows any serial protocol to be transmitted over an IP network

# Media converters

RUGGEDCOM Ethernet media converters are designed to bridge the gap between copper and fiber-optic network segments, reducing installation and configuration costs.



## RUGGEDCOM RMC

Ethernet media converter (copper-to-fiber)

- 10BASE-T to 10BASE-FL
- 100BASE-TX to 100BASE-FX



## RUGGEDCOM RMC20

Serial media converter (copper-to-fiber)

- RS485/RS422/RS232 conversion to multimode fiber and vice versa
- Serial port: 1 x RS485/RS422/RS232
- Ethernet port: 1 x 10BASE-FL



## RUGGEDCOM RMC40

4-port Ethernet media and speed converter

- 10/100BASE-TX to 100BASE-FX or 10/100BASE-TX
- Provides media and speed conversion
- Unmanaged switch



## RUGGEDCOM RMC41

2-port Ethernet media and speed converter

- 10/100BASE-TX to 100BASE-FX converter



## RUGGEDCOM RMC8388

Compact time protocol converter

- PTP (IEEE 1588) to IRIG-B (AM or TTL)
- PTP (IEEE 1588) to PPS
- IRIG-B AM to PTP (IEEE 1588)
- Ethernet port: 1 x 100BASE-TX/100BASE-FX

# Compact power injectors and supplies

RUGGEDCOM compact power injectors and supplies help reduce costs by eliminating separate power and data cabling.



## RUGGEDCOM RP100

Single port PoE injector

- 802.3af/802.3at compliant version
- RUGGEDCOM WIN compliant version
- -40 °C to +85 °C operating temperature (no fans)



## RUGGEDCOM RPS1300

140 W PoE 54 V DC power supply

- Input voltage: 120 V AC, 230 V AC
- Output voltage: 54 V DC
- Full 140 W power output over the entire operating temperature range of -40 °C to +75 °C
- For increased power output connect up to 3 RPS1300 devices in parallel
- NEMA TS - 2 rated



# Wide area private wireless systems

RUGGEDCOM private wireless WAN solutions enable secure long-range connectivity, extending IP networks over long distances to fixed and mobile users. These devices are certified for AeroMACS (Aeronautical Mobile Airport Communications System) and also support CBRS in the US.



## **RUGGEDCOM WIN5100**

### Vehicular subscriber unit

- 2 antennas for external connection
- Powered directly through 12 V DC, 24 V DC, or PoE
- Certified for AeroMACS



## **RUGGEDCOM WIN5100-V**

### Enhanced vehicular subscriber unit

- 10/100BASE-TX M12 interface
- 2 antennas for external connection
- Powered directly with 9 – 36 V DC
- Optional GPS
- Certified for AeroMACS



## **RUGGEDCOM WIN5200**

### Outdoor subscriber unit with PoE

- High gain integrated antenna
- Compatible with RP100
- Certified for AeroMACS



## **RUGGEDCOM WIN7000**

### High power base station

- High output power of 2 x 36 dBm
- Single cable power and Ethernet or fiber-optic interface options



## **RUGGEDCOM WIN7200**

### Base station

- Small form factor and low power consumption
- PoE single cable design
- Certified for AeroMACS

## **RUGGEDCOM WIN common features**

- Available in multiple frequencies
- Over the air IEC 61850 GOOSE messaging support
- Seamless mobility in standalone mode
- Excellent performance in NLOS (Non-Line of Sight) conditions
- Up to 40 Mbps aggregate throughput
- Mobile-WiMAX compliance based on IEEE 802.16e-2009
- Standalone solution for deployment without additional gateways

## MIL-STD products

RUGGEDCOM military standard products are designed to operate in harsh environments and are MIL-STD hardened, i.e., they meet and exceed strict specifications of the defense industry.



### RUGGEDCOM M969

10-port managed Ethernet switch with fiber uplinks

- MIL-STD and IP66/IP67 rated
- 8 x 10/100BASE-TX + 2 x 1000BASE-X



### RUGGEDCOM M2100

19-port modular managed Ethernet switch

- 3 x 1000BASE-X + 16 x 10/100BASE-X
- MIL-STD rated



### RUGGEDCOM M2200

9-port managed Gigabit Ethernet switch

- 1000BASE-X and/or 10/100/1000BASE-T
- MIL-STD rated



### RUGGEDCOM MX5000

High port density layer 2 or layer 3 switch & router

- High-density MIL-STD rated switch and router
- Supports up to 50 fiber or 98 copper ports
- Up to 96 x 10/100TX
- Up to 48 x 100FX fiber
- Up to 24 x 1000LX or TX
- Up to 2 x 10G



### RUGGEDCOM MX5000RE

Rugged enclosure for RUGGEDCOM MX5000

- MIL-STD switching/routing platform
- IP65 EMI/EMC/shock/vibration-rated enclosure
- Replaceable enclosure

#### Certifications

- MIL-STD 901D – shock (hard mounted)
- MIL-STD 167 – vibration
- MIL-STD 461 – EMI
- MIL-STD 1399 – DC magnetic field exposure
- MIL-STD 810 – temperature and humidity

## Software solutions

Rugged communications equipment requires equally rugged software. Discover solutions for network management, secure remote IED access, data conversion, routing, and visualization within the RUGGEDCOM and SINEC software family.

A modern industrial control system network contains vast amounts of data, subsets of which are of interest to control center or enterprise applications and users. RUGGEDCOM and SINEC software solutions have been developed to help the industry by providing secure access to this data, processing it into useful information, and making it available in a usable format to a wide range of users and enterprise systems.

### RUGGEDCOM CROSSBOW

RUGGEDCOM CROSSBOW is an enterprise-level secure remote access management solution designed to assist with cybersecurity compliance including NERC CIP and IEC 62443-4-1 compliant access to Intelligent Electronic Devices.

It also automates device password management, configuration and firmware version monitoring, remote connectivity verification, and data file retrieval. The distributed architecture of CROSSBOW with the Station Access Controller (SAC) and the Station Access Manager Local (SAM-L) ensures local and emergency connectivity to IEDs with full support of all the automation functions (SAM-L only), even when there is a loss of communication between the central CROSSBOW server and the remote site.

RUGGEDCOM CROSSBOW is also available as a Starter Edition to implement secure password management in smaller Industrial Control Systems and supports up to 5 users and 100 remote devices.

#### Features

- Administrator-defined Role-Based Access Control (RBAC)
- Blocking and logging of specified IED commands on a per device type/per user basis
- Automation of user login
- Strong two-factor authentication with Active Directory, RSA SecurID, and RADIUS for process security
- Audit log and reports of all activities
- Manage device passwords and configurations
- Vendor agnostic design that works with all common substation gateways and IEDs
- Flexible client-server architecture

## RUGGEDCOM ELAN

From the substation to control center, RUGGEDCOM ELAN solves a wide range of SCADA communications and data integration issues, including:

- Protocol conversion
- Data concentration
- Serial to Ethernet (TCP or UDP) conversion
- Device proxy server
- Poll acceleration
- Multi-master support
- Protocol routing
- Encryption using TLS

## SINEC PNI

SINEC PNI makes it quick and easy to commission RUGGEDCOM network components in your industrial network. Conveniently configure the basic settings to integrate devices into the network and ensure that all new network devices operate seamlessly in the network.

## SINEC INS

With SINEC INS in the OT data center, you can use a standardized user interface to manage general network services that are often needed in OT networks.

### Functions

- DHCP server: manages IP addresses and provides additional DHCP options for clients
- DNS server: resolves domain names to IP addresses
- RADIUS server: authenticates devices and authorizes users on the network
- Syslog server: securely collects and forwards network events
- NTP server: provides time synchronization for all network devices
- SFTP/TFTP server: enables secure firmware updates for network components





## SINEC NMS

SINEC NMS is a scalable network management system for digital enterprise. It goes beyond the widely adopted IT network management standards FCAPS, offering essential system elements specifically addressing the industrial network requirements.

For further information, please visit: [siemens.com/sinec-nms](http://siemens.com/sinec-nms)

### Northbound Interface

- Direct access to network information for further processing in other systems and applications, e.g., OPC UA ensures easy data handling
- Data preprocessing
- Short response times thanks to advanced notification management

### System Administration

- Decentralized approach with a comprehensive view of the network, regardless of its size and complexity
- Central commissioning and administration of distributed SINEC NMS Operations in SINEC NMS Control
- Efficient role and rights administration

### Fault Management

- Quick and easy location of faults
- Exact/real-time status overview for timely response in case of network faults
- Network structuring provides maximum transparency
- Reliable diagnostics via central evaluation of network capacity utilization

### Configuration Management

- Central, policy-based configuration and maintenance of the entire network saves time
- Easy and centralized backup and management of device configurations
- Auto/scheduled system backup and restore

### Accounting Management

- Complete overview of all network components
- Reliable monitoring of network topology
- Network reports and event documentation

### Performance Management

- Network optimization based on performance evaluation
- Transparency through statistics creation and data storage
- High level of availability due to constant network monitoring
- Early detection of changes in the network

### Security Management

- Reliable fulfillment of process-based and technical security requirements according to IEC 62443
- Increased network security, e.g., central policy-based firewall configuration
- Enhanced security with defined user management and advanced certificate management
- Central network documentation via policy-based reports, e.g., for audits



# RUGGEDCOM Edge computing solutions

RUGGEDCOM product line offers solutions and innovations to provide robust network stability and efficiency, allowing you to take your intelligence to the network edge.

## RUGGEDCOM VPE1400

RUGGEDCOM VPE1400 provides a virtualized environment to run a guest Linux operating system and third party applications on the RX1400, enabling intelligence at the network edge. Virtualization allows a full Linux image (with dedicated storage media and I/O ports) to run in parallel with the RUGGEDCOM ROX II, using a Linux KVM (Kernel Virtual Machine) based solution. The KVM ensures that the guest OS and third party applications can run without impacting RUGGEDCOM RX1400 core services running on the system.

## CloudConnect

CloudConnect on RUGGEDCOM RX1400 or RUGGEDCOM APE1808 is an all-in-one solution for plug-and-play connectivity to all common Cloud solutions, e.g., Siemens MindSphere, Amazon Web Services, Microsoft Azure, and other Cloud solutions. This solution provides the combined capabilities of data acquisition, conversion, and communication with MindSphere or other Cloud solutions.

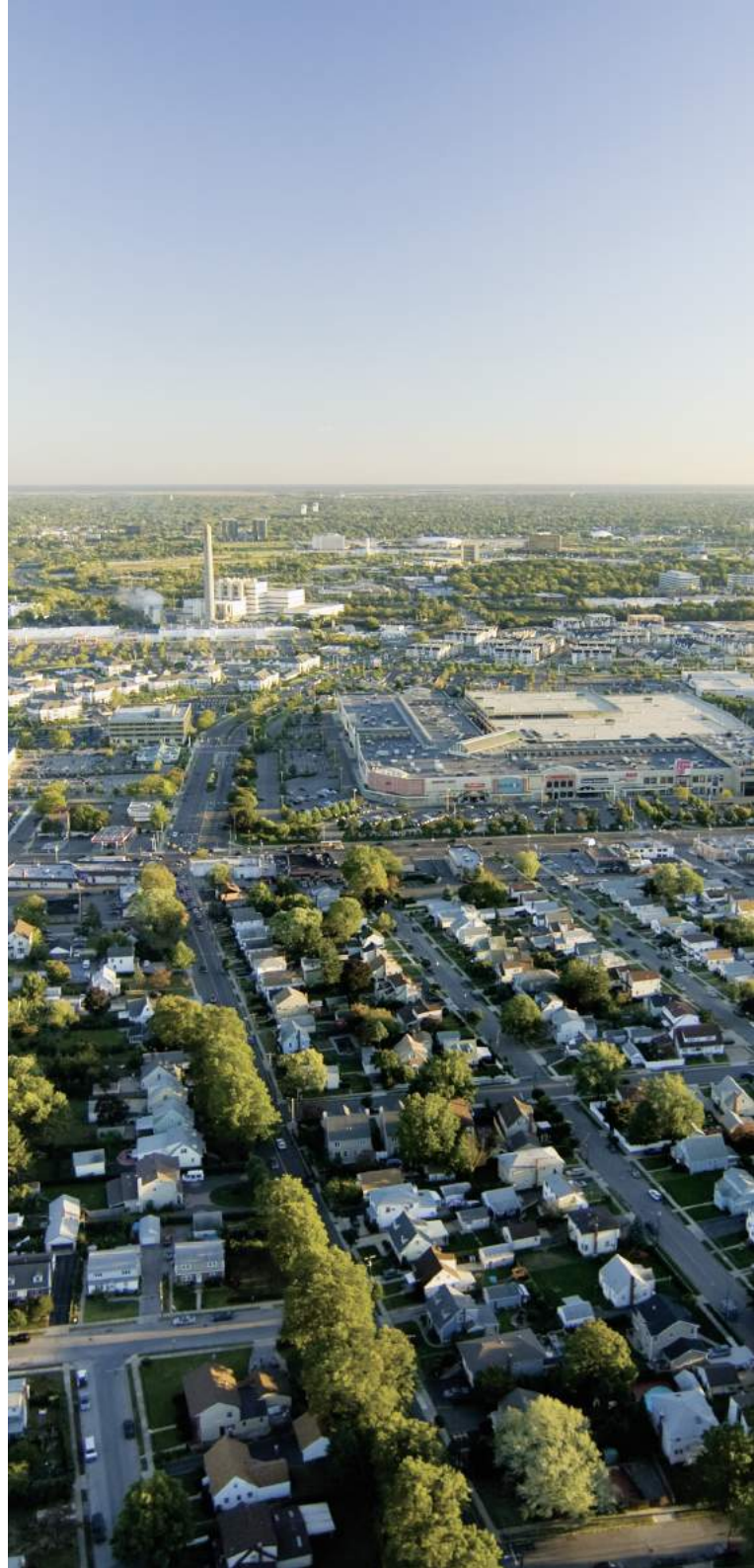
## Features

- Web-based stand-alone configuration
- Optimized data traffic based on Publish/Subscribe mechanisms
- Trigger Management for event-driven and cyclic communication

## RUGGEDCOM APE1808

RUGGEDCOM APE1808 utility-grade application processing engine is a standards-based hardware platform to deploy third-party Edge computing applications. As a line module for the RUGGEDCOM RX1500 series, it is available either with Linux or Windows 10 OS, and offers a convenient way to deploy industrial applications to the OT edge.

Learn more: [siemens.com/ruggedcom/cybersecurity](https://www.siemens.com/ruggedcom/cybersecurity)







## RUGGEDOM SELECTOR

# The tool for selection and configuration of RUGGEDCOM products

With the RUGGEDCOM Selector you can transfer the order number to the Siemens Industry Mall and order your products.

To use the RUGGEDCOM Selector for the selection and configuration of RUGGEDCOM products, visit: [siemens.com/ruggedcom-selector](http://siemens.com/ruggedcom-selector)



## FastConnect™ Cabling System

Stringent demands are placed on the installation of cables in an industrial environment. Siemens offers FastConnect™, a system that fulfils all these requirements: on-site assembly – quick, easy, and error-free.

For more information, visit: [siemens.com/fastconnect](http://siemens.com/fastconnect)



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Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

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Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit: **[siemens.com/industrialsecurity](https://www.siemens.com/industrialsecurity)**

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